



ADAPTATION FUND

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Project and Programme Review Committee
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Bonn, Germany, 19-23 October 2026

PROPOSAL FOR BOLIVIA



ADAPTATION FUND

ADAPTATION FUND BOARD SECRETARIAT
TECHNICAL REVIEW OF PROJECT PROPOSAL FOR
"STRENGTHENING CLIMATE ADAPTATION THROUGH SUSTAINABLE COOLING
SOLUTIONS FOR VULNERABLE COMMUNITIES IN THE PLURINATIONAL STATE OF
BOLIVIA "

Project Title	Strengthening climate adaptation through sustainable cooling solutions for vulnerable communities in the Plurinational State of Bolivia
Project ID	AF00000549
Category	Regular size project (over \$1 million)
Type	Single country project
Stage	Concept
Country	Bolivia
Implementing Entity	UNIDO
Financing Requested	USD 10,000,000.00
Reviewer	Lystra Fletcher-Paul Fletcher-Paul

Co-reviewer(s)

IE Contact Person

Carolina Tataje Gonzales, Fatou Haidara, Ganna Onysko, Mark Grigoryan, Natale Guarnaccia, Olga Gordiievska, Valeria Arroyave Cardozo

Secretariat's Overall Comment

The project “Strengthening climate adaptation through sustainable cooling solutions for vulnerable communities in the Plurinational State of Bolivia (ADAPT COOL Bolivia)” aims to increase the climate resilience of agri-food systems in Bolivia by reducing climate-induced post-harvest losses through the deployment of climate-resilient cold chain solutions, thereby improving food security, livelihoods, and access to safe and nutritious food for vulnerable populations. The proposal includes a PFG request of 150,000 USD. The initial technical review raises several issues, such as the Theory of Change, estimates of direct and indirect beneficiaries, quantification of benefits and cost effectiveness, sustainability, contradictory data, Environmental and Social Risks and Impacts and Alignment with the Results Framework, among others, as is discussed in the number of Clarification Requests (CRs) and Corrective Action Request (CAR) raised in the review.

Country Eligibility

Is the country party to the Kyoto Protocol, or the Paris Agreement?

Response: Yes

Secretariat: Bolivia is party to both the Kyoto Protocol and the Paris Agreement. Bolivia ratified the Kyoto Protocol on November 30, 1999, and subsequently signed and ratified the Paris Agreement in 2016

Is the country a developing country particularly vulnerable to the adverse effects of climate change?

Response: Yes

Secretariat: Yes, Bolivia is a developing country which faces a high level of vulnerability to climate change, characterized by a sustained increase in temperature, a growing frequency and intensity of extreme weather events, and rising pressure on productive systems, particularly within the lowland agri-food sector. In parallel, Bolivia is highly exposed to extreme climatic events. The country records increasing events per year, including droughts, frosts, floods, and hailstorms, which directly affect agricultural production and food availability.

Project Eligibility

Has the designated government authority for the Adaptation Fund endorsed the project/programme?

Response: Yes

Secretariat: As per letter dated July 6, 2026

Does the length of the proposal amount to no more than Fifty pages for the project/programme concept, including its annexes?

Response: Cleared

Secretariat: Yes, the document is 50 pages long, including Annexes CAR1: Please ensure that all Tables and Figures are numbered and titled

Does the project / programme support concrete adaptation actions to assist the country in addressing adaptive capacity to the adverse effects of climate change and build in climate resilience?

Response: Not Cleared

Secretariat: Yes, however additional information is required The project aims to to increase the climate resilience of agri-food systems in Bolivia by reducing climate-induced post-harvest losses through the deployment of climate resilient cold chain solutions, thereby improving food security, livelihoods, and access to safe and nutritious food for vulnerable populations. It proposes to do this through four components - enabling environment, capacities, infrastructure and finance, and monitoring and learning . Part II A (para 47 - 82) describes the components their objectives, target populations, outcomes, outputs, activities and targets. The activities respond to specific adaptation problem. However the proposal does not contain a Theory of Change to show the the causal chain from the identified climate hazards and barriers through activities, outputs and outcomes to the project goal, with the critical assumptions. CR 1: The concept presents observed trends but no scenario analysis. It also projects that post-harvest losses “could increase by 10–20% by 2030 due to higher temperatures and variability” however, this statement is not substantiated by the source of the information or the methodology used to estimate this projection. Please substantiate it, and present the climate projections for the target regions, including their scenario, horizon and uncertainty range. CR2: In all the Components, the artisanal fishers are mentioned among the target population, however, there is no information in the Background and Context about the Fisheries sector to justify their inclusion in the project. CAR2 : Please ensure the titles in the Project Components and Financing Table are consistent with the descriptions in Part II A. In the components and financing table, the components are titled: “Enabling Environment”, “Capacity Building and Inclusion”, “Climate-Resilient Infrastructure and Finance” and “Knowledge and Adaptive Learning”, whereas the narrative in Part II A, they are named: “Policy and Enabling Environment for Resilient Cold Chains”, “Adaptive Capacity and Inclusive Participation”, “Resilient infrastructure transformation” and “Monitoring, evaluation, and knowledge management of the project”. Similarly, Output 2.2 is titled “Access to finance and innovation capacities strengthened” in the components table and “Access capacities to financing and innovation strengthened” in Table 4. CR3: Please include a description and diagram of the Theory of Change, including the risks and assumptions associated with achieving the overall goal of the project.

Does the project / programme provide economic, social and environmental benefits, particularly to vulnerable communities, including gender considerations, while avoiding or mitigating negative impacts, in compliance with the Environmental and Social Policy and Gender Policy of the Fund?

Response: Not Cleared

Secretariat: Yes, however additional information is required Part II B (para 83 - 96) describes the economic, social and environmental benefits . Vulnerable groups (smallholder farmers, artisanal fishers, rural and Indigenous communities, women producers and rural youth) are specifically identified and an initial gender analysis is included in Annex 1. However, The concept note does not contain any estimates of the number of direct or indirect beneficiaries, neither are the data disaggregated by sex or vulnerable group. CR 4: The Section makes a number of claims: (i) "a reduction of climate-related post-harvest losses by 15– 25% and increased and stabilised incomes for small producers (para 85)" (ii) an increase of at least 20% in the redistribution of food to vulnerable populations (para 90). Please substantiate those claims by the relevant baseline data and explain the method used to estimate the figures presented and/or provide information on the source of the data. . CR 5: Please provide quantitative estimates of economic, social and environmental benefits wherever possible as well as data on direct and indirect beneficiaries disaggregated by sex and vulnerable groups. The CN states that project will comply fully with the Adaptation Fund's Environmental and Social Policy and Gender Policy (para 97 - 99) and that all activities will undergo environmental and social screening, and an Environmental and Social Management Plan (ESMP) will guide risk mitigation, monitoring, and compliance. CR 6: Several of the figures in the context section contradict one another and should be reconciled: These include: the agricultural sector is said to contribute "approximately 10.6% to GDP" (para 5) and "17% of Bolivia's Gross Domestic Product (GDP) (INE, 2024)" in para 13; the number of agricultural production units is given as 861,608 (Agricultural Census, INE 2013) in para 13 and "approximately 872,000" in para 15; and the Indigenous share of the population is given as 40.6% in the concept note and "between 40 and 62%" in the Gender Assessment. Please also give the source and reference year for the statement that "more than 2.7 million children and adolescents (24% of the population)" live in areas at high risk of floods and droughts, (para 20). CR 7: Please add an explicit statement that the project will not lead to maladaptation and will not increase the vulnerability of beneficiaries or non-beneficiaries or reduce their capacity to adapt,

Is the project / programme cost effective?

Response: Not Cleared

Secretariat: Yes, however additional information is required Part II C (para 100 - 107) indicates that the project is cost effective because it: (i) reduces losses rather than requiring increased production; (ii) leverages existing infrastructure and systems; (iii) lowers operational costs through efficient technologies; (iv) strengthens local capacities to ensure sustainability; and (v) delivers economic, social, and environmental co-benefits through a single integrated investment. Thus the project recovers economic value by reducing losses rather than by increasing production. The scope and approach are logical and coherent and demonstrates cost-effectiveness from a sustainability perspective. However, the analysis does not provide any quantitative estimates of cost-benefit analysis. CR 8: Please provide an estimate of the value of losses avoided where possible. CR 9 Please present at least one alternative against which the proposed interventions can be assessed

Is the project / programme consistent with national or sub-national sustainable development strategies, national or sub-national development plans, poverty reduction strategies, national communications and adaptation programs of action and other relevant instruments?

Response: Not Cleared

Secretariat: Yes, however additional information is required. Part II D (para 108 - 113) describes how the project/programme is consistent with national or subnational sustainable development strategies, citing Bolivia's

NAP, the Nationally Determined Contribution, the Second National Communication to the UNFCCC; the Patriotic Agenda 2025 on food sovereignty and the eradication of hunger; the Framework Law of Mother Earth and Integral Development for Living Well (Law 300); the Law of the Community Agricultural Productive Revolution (Law 144); the Economic and Social Development Plan (PDES); and the Montreal Protocol and its Kigali Amendment. For each of the strategies, the CN describes how the project is aligned with it at the level of specific goals and targets. CR 10: Please ensure that all relevant sub-national and sectoral plans are included among the list provided

Does the project / programme meet the relevant national technical standards, where applicable, in compliance with the Environmental and Social Policy of the Fund?

Response: Not Cleared

Secretariat: Yes, however additional information is required Table 6 in Part II E (para 114 and 115) identifies eight instruments, their respective date and version and states the project component, output and activity of relevance to each instrument. However, no information is provided on the agency which is responsible for compliance with the standard, neither is there information on the steps required for compliance. CAR 3: Please revise the table and state the national technical standard, the agency responsible and the steps required for compliance

Is there duplication of project / programme with other funding sources?

Response: Not Cleared

Secretariat: Unsure Part II F (para 116 - 118) states that various initiatives related to climate change, rural development, and agricultural innovation are being implemented in Bolivia. However, only two examples are mentioned: the Agro-INNOVATEC 2026 project, led by UNDP and projects under the framework of the Montreal Protocol. There is no information on the projects themselves, any areas of overlap or duplication or lessons learned. CR 11: Please prepare a table with a more comprehensive list of potentially overlapping projects both past and on-going. For each project please indicate their respective years of implementation, donors, budgets; their objective and focus, synergies with the current proposal, lessons learned and considerations for design and areas of complementarity or no duplication.

Does the project / programme have a learning and knowledge management component to capture and feedback lessons?

Response: Not Cleared

Secretariat: Yes, however additional information is required Part II (para 119 - 123) describes the learning and knowledge management aspects of the project. Component 4 is dedicated to learning and knowledge management, while the other components also have elements of relevance to knowledge management. For example, Component 1 on Governance establishes specific monitoring, evaluation, and knowledge management functions. Component 2, on capacity-building also plays a central role in knowledge management through training processes, technical assistance, and hands-on learning activities. Knowledge products – guidelines, operational manuals, post-harvest and cold chain management protocols and management models – are to be published on the UNIDO website, CAR 4: Please indicate which national institution will host the national platform on sustainable cooling in food systems and maintain it after project completion, and confirm the arrangements

for the continued availability of the knowledge products. lessons learned from CR 12: Please ensure that the project also includes opportunities for feedback on the effectiveness of knowledge products and training activities to allow for adjustments which promote improved learning.

Has a consultative process taken place, and has it involved all key stakeholders, and vulnerable groups, including gender considerations in compliance with the Environmental and Social Policy and Gender Policy of the Fund?

Response: Not Cleared

Secretariat: Yes, but additional information is required Part II H (para 124 - 126) describes the consultative process. Preliminary consultations and technical exchanges with CAINCO, the Directorate of Climate Change, and within the Vice-Ministry of Environment, Biodiversity, Climate Change and Forest Management and Development, including the Governmental Ozone Commission. These consultations provided strategic inputs on priorities, coordination opportunities and feasibility. No consultations were held with any of the groups the project identifies as its target population. However, the concept states expressly that a comprehensive, in-depth and structured consultation process – including producer organisations, cooperatives, rural and Indigenous communities, women producers, the Food Bank of Bolivia and social organisations involved in food distribution – will be undertaken only during the project formulation grant phase. CR 13: Please provide the record of the consultations already held: dates, institutions, numbers and roles of participants, sex-disaggregated participation, the issues raised and any resulting change to the design. CAR 5: Please ensure that sufficient funds are allocated in the PFG for the comprehensive consultations

Is the requested financing justified on the basis of full cost of adaptation reasoning?

Response: Not Cleared

Secretariat: Yes, however additional information is required Part II I (para 127 - 133) explains why the requested financing is justified on the basis of full cost of adaptation. The section describes the baseline scenario followed by the adaptation scenario, and the difference between the two is identified as the incremental cost of adaptation, The barriers that prevent the private sector from meeting these costs – high upfront investment, limited access to finance, high perceived risk in underserved regions – are also stated, making the case for full cost adaptation. However, it is not clear whether the project has co-funding from other sources and whether the project is able to deliver its outcomes and outputs regardless of the success of the other project(s). CAR 6: Please indicate whether the project has co-funding from other sources and whether it is able to deliver its outcomes and outputs regardless of the success of the other project(s).

Is the project / program aligned with AF's results framework?

Response: Not Cleared

Secretariat: No The Table in Part III A (pages 39 - 44) shows how the project is aligned with the AF results framework. However, the table needs to be adjusted using the guidelines set out in Results Framework Alignment Table: <https://www.adaptation-fund.org/document/alignment-with-adaptation-fund-results-framework-template-and-guidance-dec-2025/> CAR 7 :The Project Objectives and Components in the Alignment Table are not aligned with those in Part 11 Sections A and B. CAR 8: Please ensure consistency between AF Outcomes, Outcome indicators, Outputs and Input indicators in the upper and lower sections of the Alignment

Table as explained in the guidelines mentioned above.

Has the sustainability of the project/programme outcomes been taken into account when designing the project?

Response: Not Cleared

Secretariat: Yes, however additional information is required Part II J (para 134 - 143) explains that sustainability of the project outcomes has been taken into account in designing the project through an approach that integrates technical, financial, institutional, social, and environmental dimensions of sustainability and these dimensions are elaborated in the Concept note. However, issues such a ownership, operation and maintenance of equipment and infrastructure have not been adequately explained. CR 14: Please state the arrangements for ownership, operation, maintenance and transfer of the assets financed through the grant facility. CR 15: Please explain how institutional continuity will be achieved after the project ends and whether any instrument – memorandum of understanding, ministerial resolution or similar – will formalise the platforms.

Does the project / programme provide an overview of environmental and social impacts / risks identified, in compliance with the Environmental and Social Policy and Gender Policy of the Fund?

Response: Not Cleared

Secretariat: Yes, however additional information is required Part IIK (para 144 - 159). provides an overview of the environmental and social impacts and risks identified as being relevant to the project/programme. The section states that an initial environmental and social risk assessment was conducted in line with the Adaptation Fund's Environmental and Social Policy and Gender Policy and UNIDO's own safeguards policy and that the project was classified as Category B. The table in Part II K presents the screening of risks against Checklist of the AF 15 principles For each principle, it indicates whether further assessment is required, potential impacts and risks, and management required for compliance. The project also anticipates the implementation of Unidentified Sub-Projects (USPs) under Component 3. Details of the USPs are provided in paragraphs (145 - 148). Indigenous Peoples and Free, Prior and Informed Consent (FPIC) are also a consideration of the project and this aspect of the project is described in paragraphs 149 - 154).. The Gender Assessment is presented in paragraphs 155 - 158 as well as Annex 1. CAR 9: Please note that Principles 1, 4 and 6 always apply as continuous monitoring is expected of these principles. Thus, the Checklist and narrative in the ESMP Plan should be changed to reflect this. CAR 10: The risks and potential impacts are not adequately described and many of the risk determinations cannot be substantiated at this time because the sub-project sites, technologies and beneficiaries are not yet known since they may be part of the USPs. Moreover, The Indigenous Peoples rating of "Low" is not appropriate if 40.6% of the population identifies as Indigenous and where Indigenous Peoples and local communities hold or use approximately 48.6% of the land. (see para 149 - 154, Indigenous Peoples and Free, Prior and Informed Consent (FPIC). Please provide a more detailed description of all potential direct, indirect, transboundary, and cumulative impacts that could result from the proposed project/programme and for the principles related to Physical and Cultural Heritage and Lands and Soil Conservation, please put an X in the second column of the table and move the explanation to the third column of the table,

Resource Availability

Is the requested project / programme funding within the cap of the country?

Response: Cleared

Secretariat: Yes. The amount requested (USD 10,000,000) is within the cap of the country.

Is the Implementing Entity Management Fee at or below 8.5 per cent of the total project/programme budget before the fee?

Response: Not Cleared

Secretariat: The figures are rounded and add up. The IE fee is USD 783,410 which is 8.5 %. The PFG request is for USD 150,000 which is appropriate for a project of over USD 5 million. The Implementing Entity fee for the PFG of USD 11,751, which is appropriate. CAR 11: Please correct the amount of financing requested on the CN cover page to a whole number (i.e. 10,000,000), without decimals.

Are the Project/Programme Execution Costs at or below 9.5 per cent of the total project/programme budget (including the fee)?

Response: Not Cleared

Secretariat: The Project execution cost is USD 668,635, which is 7.25%, and therefore below the 9.5% ceiling. The figures are whole numbers and are consistent with the components table. CR 16: The Implementing Entity is also one of the Executing Entities. UNIDO will be responsible for the overall implementation of Components 1, 2, and 4. Where the Implementing Entity provides execution services, the execution cost for the portion it executes is limited to 1.5% of that portion. In preparing the detailed budget for the Fully Developed proposal, please provide the breakdown, identify the execution cost attributable to UNIDO, and ensure that it is within the 1.5% limit.

Response: Cleared

Secretariat: N/A

Eligibility of IE

Is the project/programme submitted through an eligible Implementing Entity that has been accredited by the Board?

Response: Cleared

Secretariat: Yes, UNIDO's accreditation is valid till 30 October 2027

CONCEPT NOTE PROPOSAL FOR SINGLE COUNTRY

PART I: PROJECT/PROGRAMME INFORMATION

Title of Project/Programme: Strengthening climate adaptation through sustainable cooling solutions for vulnerable communities in the Plurinational State of Bolivia (ADAPT COOL Bolivia)

Country: Bolivia

Thematic Focal Area: Multisector project

Type of Implementing Entity: Multilateral Implementing Entity

Implementing Entity: United Nations Industrial Development Organization (UNIDO)

Executing Entities: UNIDO, Santa Cruz Chamber of Industry, Commerce, Services and Tourism (CAINCO)

Amount of Financing Requested: 10,000,000 (in U.S Dollars Equivalent)

Project Formulation Grant Request (available to NIEs only): Yes ☒ No ☐

Amount of Requested financing for PFG: 150,0000 (in U.S Dollars Equivalent)

Letter of Endorsement (LOE) signed: Yes ☒ No ☐

NOTE: LOEs should be signed by the Designated Authority (DA). The signatory DA must be on file with the Adaptation Fund. To find the DA currently on file check this page: <https://www.adaptation-fund.org/apply-funding/designated-authorities>

Stage of Submission:

- ☒ This concept has been submitted before
- ☐ This is the first submission ever of the concept proposal

In case of a resubmission, please indicate the last submission date: 7/15/2026

Please note that concept note documents should not exceed 50 pages, including annexes.

Project/Programme Background and Context:

Provide brief information on the problem the proposed project/programme is aiming to solve. Outline the economic social, development and environmental context in which the project would operate.

Background and Context:

1. Bolivia is a developing economy characterised by a strong dependence on primary sectors, particularly hydrocarbons, mining, and agriculture, alongside a growing service sector in urban areas. Notwithstanding important progress in poverty reduction in recent decades, persistent structural disparities remain between urban and rural areas, reflected in limited infrastructure, constrained access to basic services, weak connectivity, and low productivity. These structural constraints are especially pronounced within agri-food systems.
2. Bolivia's agricultural sector plays a central role in the country's economy, rural livelihoods, and food security. Contributing approximately 17% of national GDP, it represents the second most important source of economic and social sustenance in rural areas. The sector provides direct employment to nearly two million people and supports the livelihoods of a large share of the rural population through more than 861,000 agricultural production units (UPAs) distributed across the country (Agricultural Census, 2013, Bolivia's NDC, 2025). Within the agricultural sector, inland fisheries and aquaculture remain important sources of income, nutrition and animal protein, particularly for rural and Indigenous communities. According to the Agricultural Census, approximately 105,379 agricultural production units (12.1% of all UPAs) participate in fishing activities, with the highest concentration located in Santa Cruz and Cochabamba. Commercial fisheries production reaches approximately 6,568 tonnes annually, contributing to local livelihoods and food security.
3. Bolivia's updated NDC stated that the sector is also highly vulnerable to climate change and climate variability. Increasing temperatures, changing precipitation patterns, and the growing frequency and intensity of extreme weather events, including hailstorms, frosts, droughts, floods, and pest outbreaks, are already affecting agricultural productivity, food security, and rural livelihoods. According to the Unit for Risk Management and Climate Change of the Ministry of Rural Development and Lands (UGRyCC-MDRyT), hailstorms, frosts, droughts, floods, and river overflows have been the most significant climate-related hazards affecting the agricultural sector over the last decade. These impacts are particularly severe for smallholder and family farmers, who depend on climate-sensitive crops and have limited adaptive capacity. Climate-related hazards are causing increasing losses in agricultural production. Hailstorms can damage up to 50% of annual potato and quinoa production in some areas, while prolonged droughts reduce water availability for irrigation and affect the productivity of strategic crops. Climate change is also contributing to the expansion of pests and diseases and increasing production risks across Bolivia's diverse agroecological regions. Fisheries and aquaculture are similarly exposed to climate risks. Rising temperatures, altered hydrological regimes, droughts, floods and increasing climate variability affect aquatic ecosystems, fish stocks, aquaculture production and the quality of fish products. Extreme heat and higher ambient temperatures also accelerate spoilage and reduce the shelf life of fish and other highly perishable foods, while floods and disruptions to transport networks can interrupt market access and food distribution. These impacts are particularly relevant in the Amazon, La Plata and Altiplano basins, where fisheries and aquaculture provide an important source of income, nutrition and food security for rural and Indigenous communities.
4. In response to these challenges, Bolivia's Nationally Determined Contributions (NDCs) highlight the need to strengthen resilience within agri-food systems. Sectoral Target 18 prioritises the adoption of sustainable agricultural practices, improved water

management, and enhanced adaptive capacities, while Sectoral Target 24 focuses on reducing post-harvest losses and improving the preservation of perishable products through strengthened storage, processing, and distribution systems, including cold chain infrastructure and logistics. Taken together, these priorities underscore the need for integrated interventions that address both production and post-harvest stages of the value chain. Similarly, Bolivia's National Adaptation Plan (NAP) process seeks to strengthen institutional capacities, enhance climate risk governance, and integrate adaptation into sectoral and territorial planning processes. Although still under elaboration (GIZ 2026), the NAP emphasises the importance of resilient food systems, territorial approaches to adaptation, and investment in climate-resilient productive infrastructure.

5. Deficiencies in Bolivia's cold chain systems constitute a critical vulnerability. Limited availability of pre-cooling infrastructure, refrigerated storage, cold transport, and temperature-controlled marketing systems results in significant losses of perishable products, including dairy, fruits, vegetables, and animal protein. These losses directly reduce producers' incomes, compromise food quality and safety, and constrain access to nutritious diets. Across the value chain, systemic gaps exist, including insufficient pre-cooling capacity at the production stage, inadequate aggregation and storage infrastructure outside major urban centres, lack of refrigerated transport, and weak commercialisation practices. These challenges are compounded by enabling constraints such as limited access to finance, insufficient technical capacity, reliance on inefficient technologies, and weak regulatory and standards frameworks.
6. In this context, strengthening climate-resilient cold chain systems represents a strategic adaptation opportunity to address one of the most critical and growing vulnerabilities affecting Bolivia's agri-food systems. By improving the preservation, storage, transport and distribution of perishable products, resilient cold chains can reduce climate-induced post-harvest losses, improve food quality and safety, enhance food security, and strengthen the resilience of vulnerable populations whose livelihoods depend on agriculture, fisheries and food-related value chains.
7. The proposed project, Strengthening Climate Adaptation through Sustainable Cooling Solutions for Vulnerable Communities in Bolivia (ADAPT COOL Bolivia), has been designed to address the technical, institutional, financial and capacity barriers that currently limit the adoption of climate-resilient cold chain systems. The project adopts a food-systems approach that combines policy and institutional strengthening, capacity development, deployment of climate-resilient cooling technologies and sustainable financing mechanisms to support long-term transformation of post-harvest systems in climate-vulnerable territories. The institutional framework supporting adaptation and agricultural development involves multiple actors with complementary roles. At the national level, the Ministry of Development Planning and Environment, through the Vice-Ministry of Environment, Biodiversity, Climate Change and Forest Management and Development, leads climate policy formulation and implementation, including the NAP and NDC processes. The Governmental Ozone Commission provides technical leadership on sustainable refrigeration technologies in alignment with international commitments. Sectoral responsibilities are shared with the Ministry of Rural Development and Lands, which promotes agricultural production—particularly family farming—and the Ministry of Productive Development and Plural Economy, which supports industrialisation and value chain development. At subnational level, departmental and municipal governments play a critical role in implementing policies and facilitating investments in productive infrastructure and services. Non-state actors, including the Food Bank of Bolivia and civil society organisations, contribute to food recovery and redistribution, although their impact is constrained by limited cold chain infrastructure and logistical capacity. Within this context, the proposed project would be implemented by UNIDO, providing technical oversight and ensuring compliance with Adaptation Fund requirements, in close coordination with the Government of Bolivia and private-sector

- partners.
8. Concessional financing from the Adaptation Fund is therefore essential to address these barriers, ensure climate additionality, and catalyse investment. This is consistent with Bolivia's NDC 3.0, which recognises that the implementation of climate adaptation priorities depends substantially on international climate finance, technology transfer and capacity development. Such support would enable the deployment of resilient and efficient cold chain systems, contributing to reduced vulnerability, strengthened adaptive capacity, and improved food security for vulnerable populations across Bolivia.

Economic, social and development context

9. The following table provides a territorial characterization of Bolivia's productive and climatic context, identifying the main agroecological regions prioritized for project intervention. Priority value chains have been selected based on their high perishability, sensitivity to temperature variations, and economic importance for vulnerable populations. These regions account for a large share of agricultural production and rural employment, with ~30–40% of the population dependent on family farming.

Table 1 Territorial characterization of the agroproductive regions prioritized in Bolivia.

Region	Departments Priorities	Products Strategic	Main Climatic and Logistic Problems
Altiplano	La Paz, Oruro, Potosi	Potato, quinoa	Recurrent frosts, high thermal variability, limited storage infrastructure, losses due to exposure to extreme conditions
Valleys	Cochabamba, Chuquisaca, Tarija	Fruit and vegetables	High post-harvest losses due to moderate-high temperatures, deficiencies in logistics and post-harvest handling
East / Amazon	Santa Cruz, Beni, Pando	Dairy, tropical fruits, freshwater fish	High temperatures, high humidity, accelerated deterioration of perishable products, interruptions in the cold chain

10. Bolivia also faces significant social challenges. Rural poverty remains considerably higher than in urban areas, reaching approximately 50.8% compared to 31.3% in cities. This reflects structural inequalities in access to services, productive infrastructure, technology and markets. In addition, a considerable proportion of the population faces challenges related to the availability, preservation, and access to nutritious food, particularly under increasing climate stress conditions, as depicted in Figure 1. It is estimated that around 14.1% of the population (approximately 1.6 million people) faces conditions of hunger or food insecurity, highlighting limitations in both food availability and access (FAO, 2020).
11. Its economy has historically been based on natural resources and the agricultural sector, which plays a critical role in employment, rural livelihoods, and the availability of food products for vulnerable populations. The agricultural sector accounts for 17% of Bolivia's Gross Domestic Product (GDP) (INE, 2024; Bolivia's NDC 2026-2030, 2025) and is the second-largest source of economic and social livelihoods in rural areas. This sector provides direct employment to nearly 2 million people living in rural zones, generating household income and contributing significantly to national food supply systems through 861,608 agricultural production units (UPAs) (Agricultural Census, INE 2013), distributed across the country and highly vulnerable to climate change. However, this growth has not translated into structural improvements in productivity or efficiency within agri-food value chains, which is reflected in significant losses throughout the supply chain.

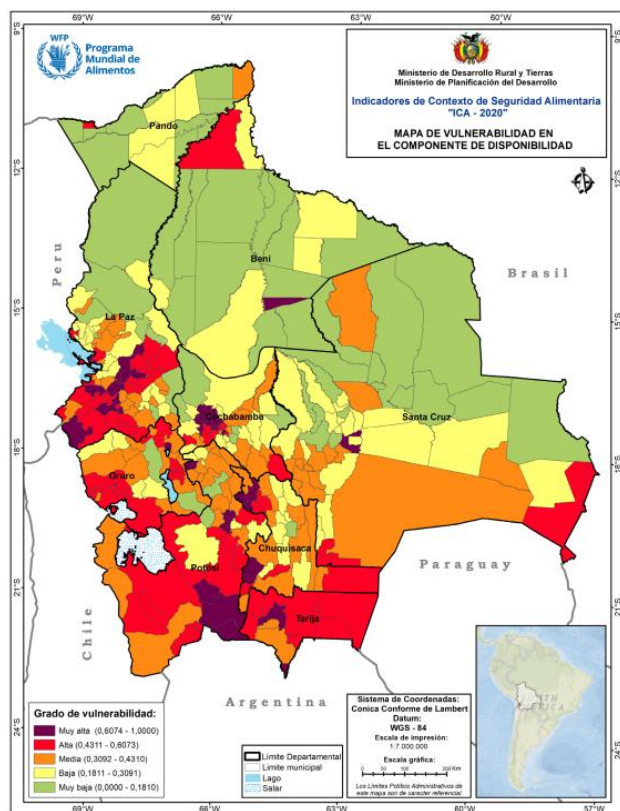


Figure 1 Food security vulnerability map

Source: Elaborated by WFP based on the integration of components (availability, access, use). of food security

Note: The north of Potosí, some municipalities of the Chaco, the south and east of Cochabamba present the highest values of food insecurity (level 5), values 3 and 4 constitute the majority of municipalities in Bolivia.

12. Bolivia's agricultural sector is concentrated across the Altiplano, inter-Andean valleys, and tropical lowlands, which together host approximately 861,608 agricultural production units, of which an estimated 96-98% are family farming operations. While Santa Cruz dominates large-scale agro-industrial production, the valleys and Altiplano are critical for the production of staple foods such as potatoes, maize, vegetables, and quinoa. Despite its importance for livelihoods and food security, the sector is characterized by low levels of technification, limited access to transport and logistics infrastructure, weak market connectivity, and a significant lack of storage and preservation systems. Cold chain infrastructure is particularly scarce in rural areas, limiting the preservation of perishable products and constraining efficient linkages between production zones and urban markets.
13. These structural limitations contribute to substantial post-harvest losses. Across Latin America, post-harvest losses are estimated at 20-30% of total food production, with particularly high losses for perishable commodities such as fruits, vegetables, dairy products, and meat. In Bolivia, rising temperatures and increasing climate variability further accelerate food deterioration, reducing producers' incomes, increasing food prices, and weakening food system resilience. These challenges are compounded by the fact that only around 62% of domestic food demand is met through national production, making food losses a significant factor behind import dependence and a key structural vulnerability affecting food availability and distribution, particularly in climate-exposed regions.

Environmental and Climate Context

14. Bolivia faces a high level of vulnerability to climate change, characterized by a sustained increase in temperature, a growing frequency and intensity of extreme weather events, and rising pressure on productive systems, particularly within the lowland agri-food

sector. This context represents a central element for the justification of the proposed project, as climate adaptation becomes a structural priority to preserve perishable products, maintain resilient food supply systems, and strengthen the climate resilience of value chains and vulnerable communities.

15. Available evidence indicates that the country is already experiencing a significant rise in temperature. At the national level, an average increase of approximately 1.1°C has been recorded, with regional variations ranging from 1 to 2.5°C in the Andean region and around 2°C in the lowlands. From a historical perspective, temperature has increased by about 1.2°C between 1890 and 2020, reflecting a warming trend that has accelerated in recent decades. More recent records show increases of up to 2.2°C, with extreme values observed in the Altiplano, where departments such as Potosí and La Paz have experienced increases of up to 4°C and 3°C, respectively. This pattern confirms the intensification of climate change and highlights its differentiated impacts across regions. In addition, More than 2.7 million children and adolescents (24% of the population) live in areas at high risk of floods and droughts (Bolivia's 2021-2030 NDCs update).
16. In parallel, Bolivia is highly exposed to extreme climatic events. The country records an average of approximately 160 events per year, including droughts, frosts, floods, and hailstorms, which directly affect agricultural production and food availability. Such conditions increase food security vulnerability, depicting the relation between food security vulnerability and floods and drought hazards. This situation is further exacerbated by projections indicating that by 2030, around 27% of the territory could face persistent drought conditions, while approximately 24% could be exposed to recurrent flooding, significantly increasing risks for productive systems.
17. Impacts on the agricultural sector are already evident. Recent events, such as the 2023 droughts, affected nearly 2 million producers across 7 of the country's 9 departments, causing significant crop losses and affecting extensive production areas. At a structural level, international studies estimate that strategic crops such as maize and soybeans could experience yield reductions of up to 40% under scenarios of water stress and rising temperatures, posing a direct threat to rural livelihoods, the stability of food supply systems, and the availability of agricultural products for vulnerable populations.
18. This climate context is compounded by structural weaknesses in the agri-food value chain, particularly at post-harvest stages. It is estimated that between 20% and 40% of perishable foods are lost due to limitations in storage, transport, and preservation. These losses are especially significant considering that national agricultural production reached approximately 19.7 million tons in the 2018–2019 season, from about 3.8 million hectares cultivated. Rising temperatures accelerate decomposition processes, reducing product shelf life and exacerbating these losses.
19. In addition, vulnerability analyses indicate that at least 71 municipalities (21% of 341 municipalities) fall into a very high vulnerability category. Municipalities in the departments of La Paz, Potosí, and Oruro are among the most vulnerable, as agriculture is predominantly family-based and the rural population is highly exposed and sensitive, with limited adaptive capacity to climate change impacts. In contrast, municipalities in Santa Cruz exhibit lower vulnerability due to higher adaptive capacity, including better access to agricultural equipment.

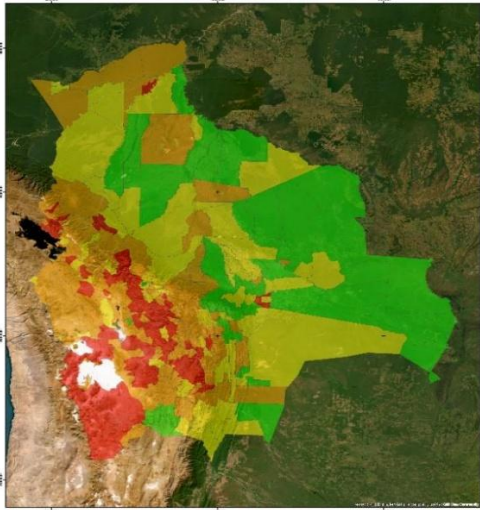


Figure 2 Vulnerability of the food sector by department in Bolivia

Source: National Map of Current Climate Change Vulnerability. Plurinational Authority of Mother Earth, 2022.

Note: Colors represent levels of vulnerability, where red indicates higher risk and green indicates lower risk.

The distribution reveals a high concentration of municipalities classified as highly and very highly vulnerable, particularly in the departments of La Paz, Cochabamba, Oruro, and Potosí, underscoring the need for targeted interventions.

20. According to the National Map of Vulnerability to Climate Change (Figure 2), Bolivia is among the countries most exposed to climate-related risks, with significant impacts on key sectors such as food, water, health, and infrastructure. This reinforces the urgency of implementing territorially differentiated adaptation measures. In this context, the country's NDC acknowledges that the climate crisis poses substantial risks to productive systems and prioritizes strengthening resilience while reducing the vulnerability of the most sensitive sectors, including agriculture. In particular, the proposed project directly contributes to national targets in the agricultural sector by enhancing the resilience of productive systems, strengthening the preservation and availability of perishable products under climate stress conditions, and reducing the vulnerability of rural populations to climate change. This is aligned with the objective of strengthening and diversifying resilient agri-food systems established in the NDCs. Furthermore, the initiative is consistent with the country's comprehensive adaptation approach, which seeks to increase adaptive capacity, reduce vulnerability, and promote sustainable production systems under the paradigm of Living Well in harmony with Mother Earth.

Project justification and climate adaptation rationale

21. In Bolivia, climate change is intensifying structural vulnerabilities in agri-food systems, increasing post-harvest losses, income instability, and food insecurity. The proposed project specifically addresses the additional adaptation needs arising from climate impacts on food preservation systems, rather than baseline infrastructure gaps. Rising temperatures, increased variability, and more frequent extreme events accelerate food spoilage and undermine traditional storage practices, making climate-resilient cold chains a necessary adaptation measure to maintain food quality, safety, and availability.
22. According to FAO (2019), approximately 12% of food produced in Latin America and the Caribbean is lost between the post-harvest and retail stages, with inadequate storage, refrigeration and transport infrastructure identified among the main drivers of food loss. Rising temperatures, increasing climate variability, and more frequent extreme weather events are expected to increase spoilage risks, reduce the shelf life of perishable products, and increase cooling requirements throughout food value chains. These effects disproportionately affect smallholder producers, women, Indigenous Peoples, and rural communities, who have limited access to cold chain services, financing, and adaptive

- technologies. Climate-induced losses reduce incomes, increase prices, and constrain access to nutritious food, exacerbating food insecurity and malnutrition.
23. Climate projections were assessed using CMIP6 multi-model ensemble outputs available through the World Bank Climate Change Knowledge Portal, consistent with the scenarios used in IPCC AR6. The project focuses on the near-term adaptation horizon (2021–2040), which is most relevant for project implementation and adaptation planning. Projected temperature increases are presented as the median value across the ensemble, together with the P10 and P90 values, which represent the uncertainty range within which 80% of model projections fall. Across all target departments, the projections indicate a robust warming trend under both SSP2-4.5 and SSP5-8.5 scenarios, with projected median temperature increases ranging from approximately 0.75°C to 1.02°C by 2040 relative to the 1995–2014 baseline.

Table 2 Projected Temperature Change (°C) in Target Departments for 2021–2040 under CMIP6 SSP2-4.5 and SSP5-8.5 Scenarios

Department in Bolivia	SSP	Median	P10 (°C)	P90 (°C)
Beni	SSP2-4.5	0.86	0.58	1.32
Beni	SSP5-8.5	1	0.66	1.64
Cochabamba	SSP2-4.5	0.79	0.54	1.11
Cochabamba	SSP5-8.5	0.95	0.66	1.23
Chuquisaca	SSP2-4.5	0.82	0.56	1.14
Chuquisaca	SSP5-8.5	0.87	0.71	1.19
La Paz	SSP2-4.5	0.82	0.54	1.13
La Paz	SSP5-8.5	0.94	0.59	1.28
Oruro	SSP2-4.5	0.93	0.6	1.22
Oruro	SSP5-8.5	1.02	0.63	1.4
Pando	SSP2-4.5	0.75	0.47	1.34
Pando	SSP5-8.5	0.9	0.59	1.69
Potosí	SSP2-4.5	0.91	0.57	1.35
Potosí	SSP5-8.5	1.02	0.7	1.48
Santa Cruz	SSP2-4.5	0.89	0.57	1.38
Santa Cruz	SSP5-8.5	1.02	0.62	1.46
Tarija	SSP2-4.5	0.79	0.51	1.1
Tarija	SSP5-8.5	0.92	0.6	1.15

Note: Values represent projected changes in mean annual temperature relative to the 1995–2014 baseline. The median corresponds to the ensemble median across CMIP6 climate models. P10 and P90 represent the uncertainty range within which 80% of model projections fall. Source: World Bank Climate Change Knowledge Portal (CMIP6 multi-model ensemble)

24. The projected warming has direct implications for the preservation, storage, transport and distribution of perishable products. Higher ambient temperatures accelerate food deterioration, reduce shelf life, and increase cooling requirements across food value chains. Inadequate refrigeration is a major contributor to food loss and cold-chain systems are critical for preserving food quality, safety, and nutritional value (UNEP & FAO, 2022).
- In the Altiplano departments (La Paz, Oruro and Potosí), projected temperature increases, increasing climate variability and heightened drought risk are expected to place additional pressure on family farming systems dependent on potato and quinoa production. Climate assessments included in Bolivia’s NDC indicate that rising temperatures and changing precipitation patterns are likely to increase water stress and agricultural vulnerability in these regions.
 - In the valley departments (Cochabamba, Chuquisaca and Tarija), rising temperatures are expected to increase spoilage risks for fruits and vegetables and raise demand for post-harvest cooling and storage solutions. FAO and UNEP note that perishable foods are particularly vulnerable to quality deterioration and losses where refrigeration and temperature-controlled logistics are insufficient (UNEP & FAO, 2022).
 - In the eastern lowlands and Amazonian departments (Santa Cruz, Beni and Pando), increasing temperatures, high humidity and greater climate variability are expected to intensify risks for dairy products, fisheries products and tropical fruits. Climate

- projections and risk assessments further indicate increasing exposure to floods, droughts and extreme weather events that may disrupt transport, logistics and food distribution systems (World Bank, 2021).
25. These projected changes reinforce the need for climate-resilient cold-chain infrastructure as a targeted adaptation measure to preserve food quality and safety, reduce post-harvest losses and strengthen the resilience of food systems and vulnerable populations under future climate conditions (UNEP & FAO, 2022).
 26. In this context, strengthening climate-resilient cold chains constitutes a targeted adaptation intervention, enabling temperature control across value chains, reducing climate exposure, preserving food quality and safety, and stabilizing livelihoods. This directly enhances the resilience of food systems and supports sustained food availability under increasing climate stress.
 27. The project addresses this challenge through an integrated adaptation approach that includes:
 - The establishment of an enabling and conducive environment for climate resilient cold chains, through climate informed market and value chain analysis, identification of priority regions and vulnerable beneficiary groups, policy and regulatory strengthening, promotion of relevant ISO standards and green certifications, and integration of environmental and social safeguards (ESS). These actions align public and private sector efforts, reduce institutional and market barriers, and ensure that cold chain solutions respond to the needs and constraints of smallholders, women, Indigenous Peoples, and other climate vulnerable actors.
 - The strengthening of technical, organizational, and financial capacities of local actors, particularly vulnerable producers, community organizations, women led enterprises, and Indigenous groups, enabling them to operate, maintain, and manage climate resilient cold chain systems over the long term. By improving skills in operation and maintenance, business and financial management, and access to financing, the project enhances local ownership, livelihood resilience, and equitable access to safe and nutritious food, ensuring that adaptation benefits reach those most affected by climate impacts. These interventions will make it possible to strengthen the cold chain systems across food supply networks, increasing their capacity to respond to climate variability while supporting resilient livelihoods and the preservation and availability of perishable products in vulnerable territories.
 - The deployment of climate resilient cold chain infrastructure and services, including energy efficient refrigeration technologies based on refrigerants with low Global Warming Potential (GWP)—such as ammonia, carbon dioxide, and hydrocarbons, as appropriate—supported through technical assistance for the adoption of proven technologies and sustainable financing mechanisms. These investments prioritize climate vulnerable regions and value chains, reducing food losses, income instability, and supply disruptions affecting small producers, SMEs, and food insecure populations, including those exposed to unreliable electricity supply and extreme heat.
 28. The project will deliver direct and measurable adaptation benefits, including:
 - Reduction of climate-related post-harvest losses by 15-25% in supported value chains and intervention areas¹.

¹ The target of 15-25% reduction in post-harvest losses is based on three considerations. First, FAO estimates that losses of perishable products in Latin America and the Caribbean commonly reach 20-30% or more, largely due to inadequate cold-chain infrastructure; in Bolivia, for example, post-harvest losses are exacerbated by the limited availability of refrigerated storage and transport. Second, evidence from FAO, UNEP shows that improved refrigeration, cold storage and refrigerated transport can significantly reduce losses in perishable food value chains. International benchmarks (IIR, cited in GIZ, Food Security and Cold Chains, 2016) further indicate that improving access to refrigeration in developing countries could prevent the spoilage of up to 23% of perishable food production, while the absence of cold-chain infrastructure has been associated with very high losses of fruits and vegetables in comparable contexts. Third, the project applies the target conservatively only to the volumes handled by the supported sub-projects, rather than to national production. The proposed 15-25% range is therefore consistent with, and in some cases below, documented loss-reduction outcomes associated with

- Improved income stability and market access for beneficiary smallholder producers, producer organizations, and SMEs through reduced post-harvest losses and improved product quality. Increase of at least 20% in the volume of food recovered and redistributed by participating food recovery organizations, such as the Food Bank of Bolivia (BAB), through improved cold storage and handling capacity².
 - Enhanced participation and leadership of women in climate-resilient food value chains through targeted training, access to technologies, financing opportunities, and participation promotion in governance structures.
29. Despite strong adaptation potential, adoption is constrained by high upfront costs, limited access to finance, low private sector participation, and technical capacity gaps. Adaptation Fund support is therefore critical to address these barriers, cover incremental adaptation costs, and enable implementation in high-risk, underserved areas through a comprehensive approach combining infrastructure, capacity building, and sustainable business models.
 30. UNIDO brings extensive experience as an Implementing Entity of the Multilateral Fund, with a long-standing portfolio focused primarily on sectoral interventions in refrigeration and air-conditioning (RAC), servicing, manufacturing transitions, and policy frameworks related to ozone-depleting substances and high-GWP refrigerants. While these interventions have traditionally concentrated on RAC applications in industrial and commercial settings, the proposed project responds to an identified gap at the intersection of cooling, food systems, and climate change adaptation—particularly for vulnerable populations that depend on agri-food value chains and are increasingly exposed to rising temperatures and post-harvest losses. Climate-resilient cooling in food cold chains remains under-supported by existing adaptation finance in Bolivia, despite its critical role in safeguarding food security, livelihoods, and resilience. Building on its technical expertise in sustainable cooling and its established relationships with national authorities, private-sector actors, and technical institutions, UNIDO is well positioned to extend this experience to the food cold chain context. These existing institutional and technical linkages—particularly with stakeholders in the refrigeration sector, policy bodies, and private-sector platforms, will facilitate effective implementation, reduce start-up risks, and enable beneficiaries to access both technical assistance and financing for climate-resilient cooling solutions.
 31. The project aligns with Bolivia's national adaptation priorities and international commitments, including the Montreal Protocol and Kigali Amendment, by promoting sustainable cooling solutions that deliver both adaptation and mitigation co-benefits.

Project/Programme Objectives:

List the main objectives of the project/programme.

32. The **overall objective** is to increase the climate resilience of agri-food systems in Bolivia by reducing climate-induced post-harvest losses through the deployment of climate-resilient cold chain solutions, thereby improving food security, livelihoods, and access to safe and nutritious food for vulnerable populations.

cold-chain interventions. Actual results will be measured against site-specific baselines through the indicator "percentage reduction in post-harvest losses in intervention areas."

² The target is informed by the operational experience of the BAB, which rescued and redistributed 369,950 kg of food in 2025, reaching 45,922 people through 269 social institutions. A significant share of the food recovered by BAB originates from farmers, wholesale markets and food-sector companies, where inadequate cold-chain infrastructure contributes to the loss of perishable products before they can be recovered and redistributed. By improving cold storage, refrigerated handling and related logistics, the project is expected to increase the volume of food that can be recovered in good condition and redirected to vulnerable populations. The target of at least 20% increase in food redistribution is therefore considered a conservative estimate for participating organizations such as BAB and will be confirmed during the PFG phase through the establishment of project-specific baselines and monitoring arrangements.

33. The project contributes to the Adaptation Fund Results Framework by: strengthening institutional capacity to reduce climate-related risks and enable climate-resilient cold chain development (Outcomes 2 and 7); increasing awareness, knowledge, and adaptive capacities among vulnerable producers, SMEs, women, Indigenous Peoples, and communities (Outcome 3); improving the resilience of productive infrastructure and services through the deployment of climate-resilient cold chain systems (Outcome 4); and generating knowledge, evidence, and learning to support replication and scaling of adaptation solutions (Outcome 3).
34. **Specific objective 1 – Enabling Environment:** Strengthen policy, regulatory, and institutional frameworks to enable climate-resilient cold chain investments, through climate-informed planning, improved standards, and enhanced public–private coordination, targeting vulnerable regions and populations.
35. **Specific objective 2 – Adaptive Capacity and Inclusive Participation:** Enhance the adaptive capacity of smallholders, SMEs, women, and Indigenous Peoples to adopt, operate, and sustain climate-resilient cold chain systems, improving livelihoods and long-term resilience.
36. **Specific objective 3 – Climate-Resilient cold chain system transformation and sustainable finance:** Scale up climate-resilient cold chain systems and services, supported by sustainable financing mechanisms, to reduce climate-induced losses, stabilize food supply, and protect vulnerable livelihoods.
37. **Specific objective 4 - Knowledge and Adaptive Learning:** Strengthen monitoring, knowledge management, and learning systems to support adaptive implementation, inform decision-making, and enable scaling and replication of climate-resilient solutions.

Project/Programme Components and Financing:

Fill in the table presenting the relationships among project components, activities, expected concrete outputs, and the corresponding budgets. If necessary, please refer to the attached instructions for a detailed description of each term.

For the case of a programme, individual components are likely to refer to specific sub-sets of stakeholders, regions and/or sectors that can be addressed through a set of well defined interventions / projects.

Project/ Programme Components	Expected Concrete Outputs	Expected Outcomes	Amount (US\$)
1. Enabling Environment	Output 1.1: Climate-informed cold chain systems planning and prioritization completed	Outcome 1: Enabling policy, institutional, and market environment established to support climate-resilient cold chains and food loss reduction	400,000
	Output 1.2: Policy, regulatory, and institutional framework for resilient cold chains systems strengthened		400,000
2. Adaptive Capacity and Inclusive Participation	Output 2.1: Adaptive, operational, and management capacities for cold chain and post-harvest handling strengthened and adopted	Outcome 2: Vulnerable producers, SMEs, and communities—particularly women, Indigenous Peoples, and smallholders—have strengthened capacities to adopt, operate, and sustain	350,000
	Output 2.2: Access to finance, and investment readiness of local actors enhanced		400,000

	Output 2.3: Organizational and business capacities of local actors strengthened	climate-resilient cold chain systems and practices.	150,000
3. Climate-Resilient cold chain system transformation and sustainable finance	Output 3.1: Technical and Financing Facility operational, enabling deployment of resilient cold chain across priority value chains and vulnerable regions.	Outcome 3: Deployment and sustainable operation of climate-resilient cold chain systems reduce climate-related losses in agri-food systems	1,000,000
	Output 3.2: Sustainable financing mechanisms for climate-resilient cold chain investments are established and operationalized		5,000,000
4. Knowledge and Adaptive Learning	Output 4.1: Community awareness, adoption of climate-resilient post-harvest practices, and knowledge-sharing networks strengthened	Outcome 4: Evidence, learning and stakeholder awareness support the replication and scaling of climate-resilient cooling solutions.	347,955
	Output 4.2: Monitoring, evaluation, learning, and knowledge management systems operational and supporting adaptive management and replication.		500,000
5. Project component total			8,547,955
6. Project/Programme Execution cost			668,635
7. Total Project/Programme Cost			9,216,590
8. Project/Programme Cycle Management Fee charged by the Implementing Entity (if applicable)			783,410
Amount of Financing Requested (USD\$)			10,000,000

Projected Calendar:

Indicate the dates of the following milestones for the proposed project/programme

Milestones	Expected Dates
Start of Project/Programme Implementation	April, 2028
Mid-term Review (if planned)	June 2030
Project/Programme Closing	March, 2033
Terminal Evaluation	June, 2033

PART II: PROJECT / PROGRAMME JUSTIFICATION

A. Describe the project/programme components, particularly focusing on the concrete adaptation activities of the project, and how these activities contribute to climate resilience. For the case of a programme, show how the combination of individual projects will contribute to the overall increase in resilience.

38. The present project is structured around an integrated set of components that combine enabling interventions, climate-resilient cold chain systems, capacity building, and financing mechanisms, with the objective of addressing post-harvest losses and the climate vulnerability of agri-food systems in Bolivia in a systemic manner. These interventions primarily target vulnerable populations, including small-scale producers, rural and Indigenous communities, and women heads of household, who require support to strengthen capacities along the value chain of the agricultural, livestock, and fisheries products they handle and bring to market.
39. Cold chain systems are no longer optional efficiency improvements but essential adaptation measures required to maintain food quality, reduce climate-induced losses, and ensure system resilience under rising temperature conditions. The project approach recognizes that gaps in infrastructure, access to appropriate technologies, financial services, and technical capacities limit the ability of vulnerable populations to adapt to climate variability and the increasing frequency of extreme events. In this regard, the project promotes an integrated intervention that combines efficient technological solutions—including climate-resilient cold chain systems—with processes for organizational strengthening, improved access to finance, and market integration, under an inclusive, territorial, gender-responsive, and culturally sensitive approach. Theory of Change. The Theory of Change underpinning the project is based on the premise that climate change is increasing post-harvest losses and disrupting food systems through rising temperatures, climate variability, droughts, floods, and other extreme events. These impacts disproportionately affect smallholder producers, women, Indigenous Peoples, and vulnerable rural communities, whose adaptive capacity is constrained by technical, financial, institutional, and social barriers. The project assumes that if: (i) an enabling policy, institutional, and market environment for climate-resilient cold chains is established; (ii) vulnerable food-system actors strengthen the technical, organizational, and financial capacities needed to adopt and sustain sustainable cooling solutions; (iii) climate-resilient cold chain systems are deployed and operationalized in priority territories; and (iv) knowledge, awareness, monitoring, and adaptive learning mechanisms are strengthened, then climate-induced post-harvest losses will be reduced, the quality and availability of perishable foods will be improved, and the resilience of livelihoods and food systems will be strengthened under current and future climate conditions. This pathway contributes to the project's overall impact of strengthening the climate resilience of Bolivia's agri-food systems, improving food security and nutrition, stabilizing livelihoods, and increasing access to safe and nutritious food for vulnerable populations. Achievement of these outcomes depends on key assumptions, including the continued viability of climate-resilient cooling technologies under projected climate conditions, sustained engagement of public and private stakeholders, adoption of improved practices by beneficiaries, and the establishment of sustainable business models that support long-term operation of cold chain systems. Figure 3 presents the project's Theory of Change.

ADAPT COOL Bolivia Theory of Change

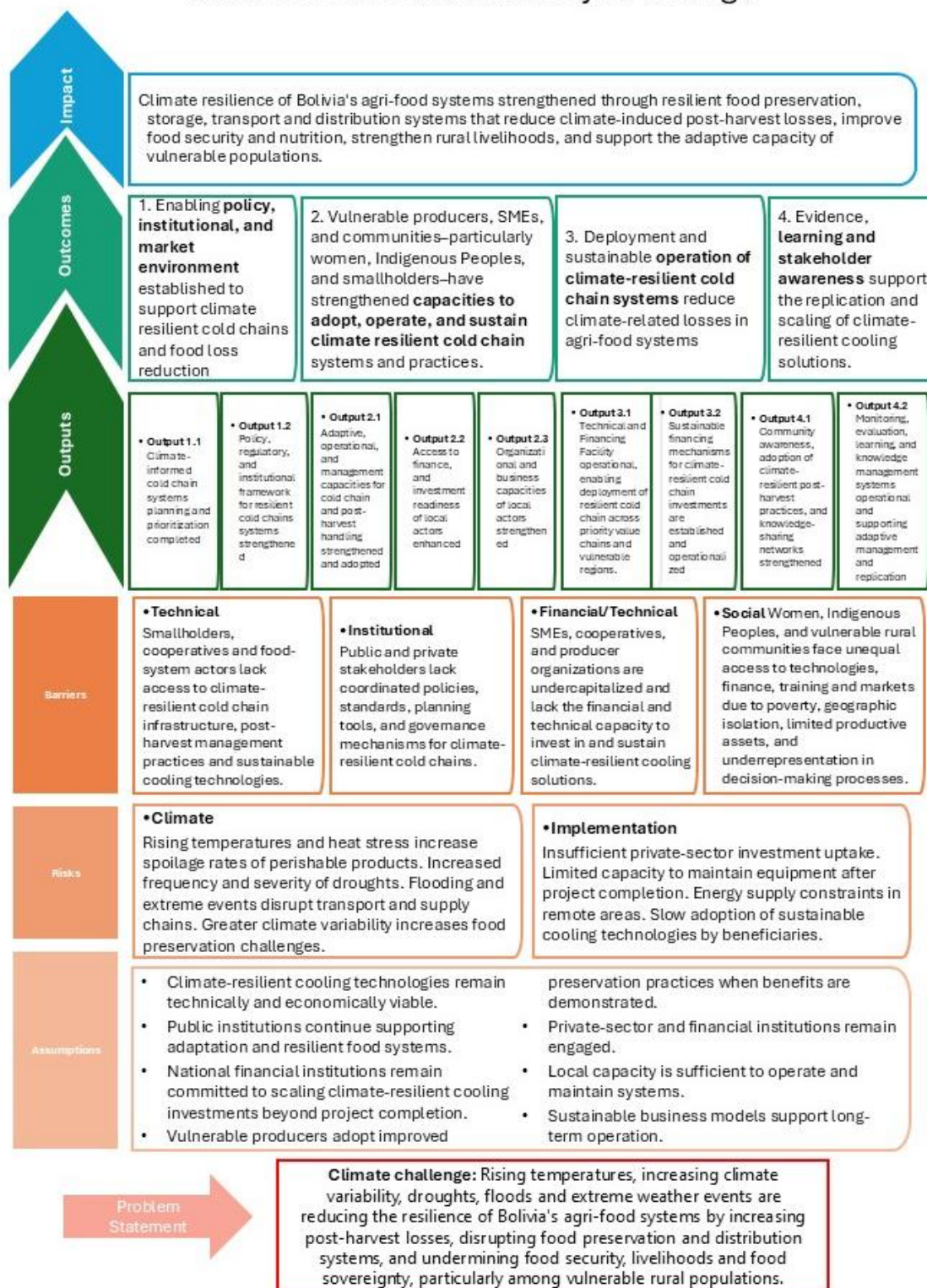


Figure 3 Adapt Cool Theory of Change

40. Component 1: Enabling Environment

41. Component 1 establishes the structural, institutional, and technical foundations required for the development of climate-resilient cold chain systems in Bolivia. This component responds to the need to create an enabling environment that supports climate-informed planning, stakeholder coordination, strengthening of the regulatory framework, and capacity development to ensure the effective implementation of adaptation solutions.
42. In the context of high climate vulnerability affecting agri-food systems in the country—particularly in regions such as the Altiplano, Valleys, and Amazon—this component addresses existing gaps in information, governance, regulation, and technical knowledge.
43. *Objective of the Component:* To strengthen the enabling environment for the development and implementation of climate-resilient cold chain systems, in order to enhance the adaptive capacity of vulnerable populations, reduce climate risks in agri-food systems, and minimize post-harvest losses, thereby strengthening the resilience and stability of food supply systems under climate stress conditions.
44. *Target Population:* The component targets key actors within agri-food systems, with a priority focus on vulnerable populations, including:
- Public institutions at national and subnational levels responsible for agricultural, environmental, and productive development policies.
 - Private sector actors involved in cold chain solutions, logistics, and commercialization.
 - Value chain actors (aggregators, transporters, distributors, markets, and food banks).
 - Smallholder farmers, artisanal fishers, and family-based production units.
 - Rural and Indigenous communities highly exposed to climate risks.
 - Producer organizations, cooperatives, and local associations.
45. The outputs and activities proposed in component 1 are described below:

Table 3 Outputs, Activities, and Indicators for Component 1.

Output	Activities and indicators
Output 1.1: Climate-informed cold chain systems planning and prioritization completed	✓ Prioritized technologies and intervention models defined along the cold chain (including production, aggregation, pre-cooling, storage, transport, and distribution) ✓ Climate-resilient and inclusive temperature-controlled food preservation and resilient cold distribution systems established and operationalized, integrating producers, wholesale markets, retailers, and food banks.
Output 1.2: Policy, regulatory, and institutional framework for resilient cold chains strengthened	✓ Comprehensive review of existing policies, regulations, and incentives, including analysis of alignment with climate adaptation, energy efficiency, and resilient food system objectives. ✓ Development of policy and regulatory recommendations for climate-resilient cold chains, in coordination with public and private stakeholders, incorporating adaptation targets and implementation mechanisms. ✓ Integration of climate adaptation considerations into planning instruments, aligned with Bolivia's NDCs (Targets 18 and 24) ✓ Identification and promotion of standards, certifications, and sustainability labels, including ISO standards, energy efficiency, and cold chain quality ✓ Development of technical guidelines for the private sector, facilitating regulatory compliance and the adoption of climate-resilient and energy-efficient technologies ✓ Establishment and operation of multisectoral coordination platforms, strengthening governance and institutional articulation

46. Component 2. Adaptive Capacity and Inclusive Participation

47. Component 2 focuses on strengthening the human, organizational, and financial capacities required to ensure the sustainability and effective operation of climate-resilient cold chain systems in Bolivia. This component addresses existing gaps in technical knowledge, operational management, organizational coordination, and access to

- financing, particularly among local actors involved in post-harvest handling, storage, transport, and distribution stages.
48. This component adopts an inclusive approach, with a particular focus on vulnerable populations, including small-scale producers, rural and Indigenous communities, women, and local actors with limited access to technical and financial services. It also incorporates culturally and linguistically appropriate strategies to ensure effective and equitable participation.
 49. *General objective:* To comprehensively strengthen the adaptive, technical, operational, organizational, and financial capacities of cold chain and post-harvest system actors through an inclusive and territorial approach, ensuring the sustainable, resilient, and efficient management of infrastructure, improving decision-making, and facilitating access to economic and financing opportunities.
 50. *Target population:* The component primarily targets key actors within the agri-food value chain, including:
 - Small-scale agricultural, fisheries, and livestock producers, particularly those in conditions of climate and socio-economic vulnerability.
 - Producer organizations, cooperatives, and local associations.
 - Operators and administrators of aggregation, storage, and distribution centers.
 - Local technicians and personnel responsible for the installation, operation, and maintenance of refrigeration systems.
 - Micro, small, and medium-sized enterprises (MSMEs) linked to the cold chain.
 - Local financial institutions interested in developing sector-adapted financial products.
 - Private sector actors, including supermarkets, agro-industry, and logistics operators.
 51. The outputs and activities proposed under Component 2 are described below:

Table 4 Outputs, Activities, and Indicators for Component 2.

Output	Activities and indicators
Output 2.1: Adaptive, operational, and management capacities for cold chain and post-harvest handling strengthened and adopted	✓ Development and implementation of training on post-harvest management under increasing temperature conditions and logistics (producers and aggregation center staff), prioritizing vulnerable populations and adapted to cultural characteristics. ✓ Development and implementation of activities to strengthen operational capacities on safe and efficient operation, monitoring of key variables, and application of standard operating procedures (operators and system administrators), with an inclusive and culturally adapted approach. 200 operators trained; ✓ Development and implementation of technical training activities on diagnostics, maintenance, and safe handling of natural refrigerants (CO₂, NH₃, hydrocarbons) according to the systems installed, with an inclusive and culturally adapted approach. ✓ Development and implementation of activities to integrate occupational safety practices and environmental safeguards in cold chain operations (all actors), with an inclusive and equitable access approach.
Output 2.2: Access to finance, and investment readiness of local actors enhanced	✓ Financial literacy and understanding financing mechanisms improved through training programs tailored to different types of actors (producers, cooperatives, MSMEs). ✓ Strengthened linkages between local actors and financial institutions through dialogue platforms, business roundtables, and technical support schemes. ✓ Replicable investment models developed (i.e., ESCO, revolving funds, credit lines with supermarket chains as guarantors, among others), adapted to local contexts and priority sectors. ✓ Private sector partnerships supporting cold chain investments, including anchor companies (supermarkets, agro-industry, logistics). ✓ Incentive mechanisms implemented for food recovery and loss and waste reduction, integrating value chain actors and food banks.
Output 2.3: Organizational and business	✓ Producer organizations, cooperatives, and local enterprises strengthened for the collective management and governance of shared cold chain infrastructure through formalized administration, operation, and maintenance schemes.

capacities of local actors strengthened	✓ Sustainable business models, tariff schemes, and cost-recovery mechanisms designed and implemented, considering territorial conditions, product type, and users' ability to pay. ✓ Business, financial, and operational management capacities strengthened, including planning, access to finance, climate risk management, and cold chain administration.
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52. Overall, Component 2 represents a fundamental pillar for ensuring the long-term sustainability of the project by enabling local actors not only to access resilient infrastructure but also to develop the necessary capacities to operate, manage, and scale it autonomously.
- 53. *Component 3: Climate-resilient cold chain system transformation and sustainable finance***
54. This component drives the transformation of the cold chain in Bolivia as a concrete climate change adaptation measure, through the development, financing, and sustainable operation of climate-resilient cooking solutions adapted to territorial and productive conditions. In alignment with the Adaptation Fund framework, it focuses on strengthening the adaptive capacity of agri-food systems and reducing their vulnerability to climate risks such as droughts, frosts, floods, and temperature variability, which directly affect food preservation, quality, and availability.
55. The project adopts a full cold chain systems approach, ensuring continuity from production to final distribution, including aggregation, storage, transport, distribution, and food recovery systems, as disruptions at any stage result in significant losses, particularly under increasing thermal stress conditions.
56. To achieve this, the component is structured around three mutually reinforcing pillars. First, a Climate-Resilient Cooling Facility will provide financing for eligible beneficiaries to access and deploy priority cold-chain technologies, including cold storage, pre-cooling systems, milk cooling systems, fisheries cooling solutions, refrigerated transport, food-bank refrigeration infrastructure, and other context-appropriate technologies. Second, beneficiaries will receive targeted technical assistance to ensure the effective adoption and long-term operation of supported technologies, including needs identification, technology selection and sizing, site assessment, investment and operating cost analysis, installation, commissioning, operation and maintenance, and user training. Third, the project will support the establishment of sustainable financing mechanisms through partnerships with national financial institutions to facilitate access to affordable financing for proven cold-chain and post-harvest technologies, including the assessment of concessional credit lines, revolving mechanisms, and other suitable financial instruments where feasible.
57. This approach will not only reduce post-harvest losses and improve value chain efficiency, but also strengthen the preservation and availability of perishable products and the livelihoods of vulnerable populations, ensuring the technical, economic, and environmental sustainability of interventions.
58. The outputs, activities, and indicators proposed under Component 3 are presented in Table 5.

Table 5 Outputs, Activities, and Indicators for Component 3

Output	Activities and indicators
Output 3.1: Technical and Financing Facility operational, enabling deployment of resilient cold chain across priority value chains and vulnerable regions.	✓ Establishment and operationalization of a competitive technical and financing facility managed by the Executing Entity, namely CAINCO, with clear eligibility criteria, performance-based disbursement conditions, and prioritization of vulnerable territories. ✓ Facilitation of access to financing for SMEs and local actors for upgrading cold chain systems, including co-financing schemes and technical screening.

Output 3.2: Sustainable financing mechanisms for climate-resilient cold chain investments are established and operationalized	✓ Establishment of strategic partnerships with national financial institutions to design and operationalize innovative financing mechanisms that improve SME access to credit for climate-resilient cold chain investments in Bolivia.
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59. The budget allocated to technology investment derives from a preliminary analysis of proven, commercially available cold chain and post-harvest technologies, their indicative cost ranges and possible configurations. The technologies considered prioritise high energy efficiency, technically proven solutions, natural or low-GWP refrigerants, and appropriate safety, operation and maintenance conditions. The indicative portfolio below shows what could be procured and for whom; it is not a definitive procurement commitment, and the final combination will be defined during detailed project preparation (PFG phase).

Table 6 Preliminary analysis of proven, commercially available cold chain and post-harvest technologies

Technology	Application / value chain	Target beneficiary	Indicative investment range (USD)	Source / reference
Walk-in cold room / aggregation cold storage	Potato, vegetables, fruits – aggregation centres	Cooperatives and producer associations	80,000 – 120,000	Project preliminary budget (UNIDO)
Pre-cooling unit (forced-air / hydro-cooling)	Fruits and vegetables	Producer organisations	40,000 – 70,000	Project preliminary budget (UNIDO)
Modular / containerised cold room (solar-ready)	Multi-product, intermediate zones	Cooperatives, logistics nodes	60,000 – 90,000	Project preliminary budget; GIZ (2016)
Small solar-powered cold room (off-grid)	Vegetables, dairy, fisheries	Smallholders, women, off-grid groups	20,000 – 40,000	GIZ (2016)
Solar PV + storage (enabling)	All (unreliable grid)	Sub-project energy backup	20,000 – 30,000	Project preliminary budget (UNIDO)
Refrigerated transport (reefer van/truck)	Inter-node logistics and distribution	Logistics nodes, distribution actors	60,000 – 80,000	Market references (to be validated)
Bulk milk cooling tank	Dairy	Dairy cooperatives (valleys/Altiplano)	15,000 – 30,000	GIZ (2016)
Flake-ice machine + insulated boxes	Fisheries	Artisanal fishers (Beni, lakes)	25,000 – 35,000	GIZ (2016)
Aggregation / market cold equipment	Multi-product distribution	Markets, nodes	30,000 – 50,000	Project preliminary budget (UNIDO)

60. Cost ranges are indicative and will be verified individually against their sources during preparation. All investments are for the adoption/deployment of existing, proven technologies – the project does not finance the development, piloting or demonstration of new technologies.
61. Three indicative investment scenarios³ illustrate how the portfolio could be configured. They are indicative only: the final mix will be established during detailed preparation, considering value chains, territorial needs, beneficiary characteristics, participation of smallholders, women and vulnerable groups, product volume, post-harvest losses, energy availability, technical capacity, economic viability and operational sustainability.

Table 7 Indicative investment scenarios

Indicative scenario	Emphasis	Indicative technology mix	Indicative reach (approx., to be refined)
A – Balanced	Wide regional coverage across value chains	Mix of aggregation cold rooms, pre-cooling, modular and solar cold rooms, milk tanks and ice machines	~4,000–4,500 direct producers; ~40–45% women; higher aggregate cold-chain volume
B – Decentralised and inclusive	Larger number of small units close to producers	Greater weight on small solar cold rooms, milk tanks, ice machines and modular units	More units and broader outreach to smallholders, local organisations, women and rural communities; lower

³ These scenarios are presented as indicative investment scenarios and do not constitute a final decision or procurement list. Beneficiary figures are planning assumptions to be confirmed during preparation; rather than assuming a single average per sub-project, beneficiary ranges will be established by type of investment and scenario. Scenario C is not technically superior to the others; each represents a different balance between coverage, inclusion and volume.

			aggregate volume
C – Higher-capacity / consolidation	Greater share for higher-capacity infrastructure	Larger cold storage and aggregation centres, pre-cooling and refrigerated transport, with some decentralised solutions	Fewer, larger facilities serving larger cooperatives; highest product volume under cold chain

62. Component 4: Knowledge and Adaptive Learning

63. This component establishes an integrated system for monitoring, evaluation, knowledge management, and community awareness, aligned with the requirements of the Adaptation Fund and UNIDO. It functions as a cross-cutting pillar of the programme, linking evidence-based tracking and learning processes with outreach, communication, and capacity-building actions aimed at promoting the adoption of climate-resilient practices in cold chain and post-harvest management. Its purpose is to ensure systematic monitoring of progress, results, and impacts, while strengthening adaptive management, accountability, and knowledge generation. At the same time, it supports the dissemination and uptake of good practices among vulnerable communities through culturally and linguistically appropriate approaches, fostering inclusive participation, local ownership, and the scaling of sustainable cooling solutions.
64. *Objective:* To establish and operationalize an integrated monitoring, evaluation, knowledge management, and community awareness system that enables the measurement of project performance, ensures compliance with Adaptation Fund and UNIDO requirements, promotes the generation and dissemination of evidence, and fosters the adoption, replication, and scaling of climate-resilient cold chain and post-harvest practices.
65. *Target population:* The component targets multiple key stakeholders involved in the implementation, monitoring, and use of project results, including:
- Public institutions responsible for climate, agri-food, and productive development policies;
 - Producer organizations, cooperatives, and local actors benefiting from the project;
 - Private sector actors linked to the cold chain and agri-food systems;
 - Financial institutions interested in replicable investment models;
 - Academia, research centers, and technical cooperation organizations;
 - Local communities and vulnerable populations as indirect beneficiaries, through access to information, good practices, and adaptive solutions.
66. This multisectoral approach ensures that the knowledge generated is accessible, relevant, and useful to strengthen climate resilience in agri-food systems and reduce post-harvest losses in the country.
67. The outputs and activities proposed under Component 4 are described below:

Table 8 Outputs, Activities, and Indicators for Component 4.

Output	Activities and indicators
Output 4.1: Community awareness, adoption of climate-resilient post-harvest practices, and knowledge-sharing networks strengthened	✓ Communities applying improved post-harvest handling and food management practices, including climate-adapted techniques and loss reduction measures ✓ Strengthened local knowledge networks and trained community promoters acting as multipliers ✓ Awareness materials developed and a national platform on sustainable cooling in food systems implemented and operational ✓ Awareness-raising campaigns implemented on quality, food safety, and climate-resilient cold chain practices, by product, actor, and region, and adapted to cultural conditions and local languages.

Output 4.2: Monitoring, evaluation, learning, and knowledge management system operational and supporting adaptive management and replication.	✓ Periodic technical, financial, and results reports prepared and submitted in accordance with Adaptation Fund and UNIDO requirements ✓ Knowledge products, lessons learned, and good practices documented and disseminated at national and sub-national levels ✓ Knowledge-sharing activities conducted to support replication, scaling, and policy uptake of climate-resilient cold chain solutions.
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68. In the Bolivian context—characterized by high cultural, territorial, and climatic diversity, as well as the presence of communities with limited access to information and services—it is essential to implement relevant, inclusive, and culturally appropriate communication strategies. These strategies will enable the translation of project objectives into concrete actions at the community level, prioritizing inclusive participation, a gender-responsive approach, cultural relevance, and local ownership.

B. Describe how the project/programme provides economic, social and environmental benefits, with particular reference to the most vulnerable communities, and vulnerable groups within communities, including gender considerations. Describe how the project/programme will avoid or mitigate negative impacts, in compliance with the Environmental and Social Policy and Gender Policy of the Adaptation Fund.

69. The project will deliver integrated economic, social, and environmental benefits by strengthening climate-resilient cold chain systems in Bolivia’s agri-food sector, with a particular focus on vulnerable populations, including smallholder farmers, Indigenous Peoples, women, and rural communities exposed to climate risks and food insecurity.
70. *Economic benefits:*
71. The project will enhance the economic resilience and livelihoods of vulnerable producers and value-chain actors by reducing climate-induced inefficiencies in post-harvest systems. By introducing climate-resilient cold chain infrastructure (pre-cooling, storage, transport, and distribution), the project is expected to reduce post-harvest losses by 15–25%, directly increasing the volume of marketable products and stabilizing incomes. The target of 15–25% reduction in post-harvest losses is based on: (i) FAO indicating post-harvest losses of approximately 20–40% for perishable products in value chains lacking adequate cold-chain infrastructure; (ii) international evidence showing that pre-cooling, refrigerated storage, and refrigerated transport can substantially reduce spoilage rates and extend shelf life for fruits, vegetables, dairy and other perishable products, particularly in developing-country food systems where losses are concentrated in the post-harvest stages; and (iii) a conservative application of loss reductions only to the volume handled through project-supported interventions rather than to total agricultural production.
72. For illustrative purposes, assuming that approximately 50,000 tonnes of perishable products per year benefit from improved cold-chain systems, a baseline loss rate of 15–20%, and a conservative 20% reduction in those losses, the project could prevent approximately 1,500–2,000 tonnes of food losses annually. Applying indicative producer prices of USD 500–700 per tonne, this corresponds to approximately USD 0.75–1.4 million per year in avoided losses, contributing to higher and more stable incomes for participating producers. These values are preliminary and will be validated through detailed value-chain assessments and cost-benefit analyses during the PFG phase.
73. Improved preservation will enable producers—particularly smallholders operating in remote areas—to delay sales, access higher-value markets, and negotiate better prices, thereby reducing dependence on distress sales. In parallel, the project will strengthen market linkages through partnerships with private-sector actors (e.g., supermarkets, agro-industry, logistics companies), facilitating integration into formal and more competitive

- value chains.
74. Access to finance will be expanded through inclusive and innovative financial mechanisms (e.g., revolving funds, leasing schemes, blended finance), addressing key barriers faced by SMEs and producer organizations. In addition, strengthened technical, organizational, and business capacities will improve productivity, quality standards, and financial management, ensuring the long-term economic sustainability of cold chain systems.
 75. These benefits are particularly significant for vulnerable rural households, as reduced losses and improved commercialization translate into increased and more stable incomes, enhanced resilience to climate shocks, and reduced economic vulnerability.
 76. *Social benefits:*
 77. The project will generate substantial social and equity benefits, particularly for populations experiencing high levels of climate vulnerability and food insecurity. A key outcome will be improved food security and nutrition, as reduced losses and strengthened distribution systems increase the availability, safety, and quality of perishable foods. The project will also support food banks and community distribution systems, increasing the redistribution of nutritious food to vulnerable populations by at least 20%⁴.
 78. Based on the proposed Component 2 focused on capacity-building, and Component 3 creating an investment envelope (USD 6 million) with expected 30 financed subprojects, the project is expected to benefit approximately 4,000–6,000 direct beneficiaries and 15,000–25,000 indirect beneficiaries, including smallholder farmers, artisanal fishers, women producers, Indigenous Peoples, rural youth, producer organisations, cooperatives and MSMEs. At least 40% of direct beneficiaries will be women (approximately 1,600-2,400 people), approximately 40% Indigenous Peoples, 70% smallholder and family producers (approximately 2,800-4,200 people), and 20% rural youth (approximately 800-1,200 people). Improved cold-chain capacity is also expected to strengthen food recovery, storage and redistribution systems, improving access to nutritious food in vulnerable territories. This is particularly relevant in Bolivia, where 116 municipalities (34% of the total) are classified as having high or very high food-security vulnerability, affecting approximately 2.39 million people (24% of the population) according to the WFP Integrated Context Analysis.⁵
 79. The project adopts a gender-responsive and inclusive approach, aligned with the Adaptation Fund Gender Policy. Women—who play a central role in production, post-harvest handling, and food commercialization—will be specifically targeted through: (I) Dedicated participation targets (minimum 40% participation in training and governance structures), (II) Tailored capacity-building programmes, (III) Priority access to financing windows for women-led enterprises and cooperatives, and (IV) Support for leadership roles in cold chain management and governance systems. These actions aim to enhance women's economic empowerment, decision-making power, and adaptive capacity, while reducing gender gaps in access to resources and opportunities.
 80. Furthermore, the project ensures the meaningful inclusion of Indigenous Peoples and marginalized groups through culturally appropriate, linguistically adapted engagement strategies, promoting equitable access to benefits and strengthening community ownership of adaptation solutions.

⁴ This target follows the assumption that post-harvest losses for perishable products are estimated between 20% and 40% in value chains affected by inadequate storage, transport and preservation infrastructure. By reducing a portion of these losses through improved refrigeration, cold storage and refrigerated transport, the project will increase the volume of food that can be safely preserved and redirected to vulnerable populations rather than being lost. The final baseline and redistribution targets will be confirmed during the PFG phase through consultations with participating organizations and detailed assessments of food recovery and redistribution systems.

⁵ All beneficiary figures and economic, social and environmental benefit estimates are preliminary and will be refined during the PFG phase using baseline surveys, value-chain assessments, stakeholder consultations and detailed cost-benefit analyses.

81. *Environmental benefits:*
82. Environmentally, the project promotes low-emission, sustainable cooling solutions that contribute to both climate adaptation and mitigation objectives. It will prioritize energy-efficient refrigeration technologies and the adoption of natural refrigerants (such as CO₂, ammonia, and hydrocarbons) with low or zero Global Warming Potential (GWP), in line with Bolivia's commitments under the Montreal Protocol and Kigali Amendment.
83. Additionally, the integration of renewable energy solutions (where feasible) will reduce reliance on fossil fuels and enhance the resilience of cold chain systems in areas with unreliable electricity access. By reducing food loss, the project will also decrease embedded emissions associated with wasted production, transport, and resource use (water, land, energy).
84. Overall, the project contributes to environmentally sustainable, climate-resilient agri-food systems, reducing pressure on natural resources while strengthening adaptive capacity.
85. *ESS and Gender Policy compliance:*
86. The project will comply fully with the Adaptation Fund's Environmental and Social Policy and Gender Policy. All activities will undergo environmental and social screening, and an Environmental and Social Management Plan (ESMP) will guide risk mitigation, monitoring, and compliance. Key measures will include resource efficiency, safe handling of equipment and refrigerants, and occupational health and safety standards.
87. Inclusive stakeholder engagement, including free, prior, and informed consultation with Indigenous Peoples, will be ensured throughout implementation, supported by a grievance redress mechanism. A Gender Action Plan will promote equitable access to resources, participation, and leadership opportunities, while mitigating risks such as exclusion or increased workloads. Overall, the project adopts a preventive and adaptive safeguards approach, ensuring that environmental sustainability, social inclusion, and gender equality are integrated across all activities. The project will not lead to maladaptation and will not increase the vulnerability of beneficiaries or non-beneficiaries nor reduce their capacity to adapt.

C. Describe or provide an analysis of the cost-effectiveness of the proposed project/programme.

88. The project demonstrates a high level of cost-effectiveness by simultaneously addressing multiple structural constraints within food systems—particularly post-harvest losses, logistical inefficiencies, and limited market access—through integrated interventions that generate sustained economic, social, and environmental benefits over time.
89. First, investments in resilient cold chain infrastructure enable a substantial reduction in food losses along the value chain. These losses represent a significant economic burden for small producers and the broader food system; therefore, reducing them results in a direct recovery of economic value without requiring increased production.
90. Second, the project prioritizes the use and strengthening of existing infrastructure (including aggregation centers, logistics networks, and Food Banks), thereby reducing initial investment costs and improving overall resource efficiency. This approach avoids duplication, accelerates implementation, and enhances operational sustainability by building on already functional systems that are adapted and scaled rather than constructed from scratch.
91. Additionally, the integration of energy-efficient technologies and renewable energy solutions (such as solar-powered systems and low-global-warming-potential refrigerants) reduces long-term operational costs, particularly in rural areas with limited or expensive access to energy. This improves the financial viability of investments while reducing dependency on future subsidies, thereby enhancing overall project sustainability. Renewable energy integration supports adaptation by ensuring reliable operation of cold chain systems in contexts of unstable electricity supply under climate stress conditions.
92. The capacity-building component is a key contributor to cost-effectiveness, as it ensures

- that infrastructure investments are properly operated and maintained by local stakeholders. This reduces the risk of technological failure, extends equipment lifespan, and avoids additional costs associated with repairs or replacement. Moreover, the development of management models and organizational capacities enables more efficient and autonomous system operation.
93. Furthermore, strengthening Food Banks and distribution systems allows for the recovery and redistribution of food that would otherwise be wasted, channeling it to vulnerable populations. This mechanism generates high social returns at low marginal cost by leveraging existing surpluses and improving overall system efficiency without requiring significant increases in production.
 94. The financial component further enhances cost-effectiveness by facilitating access to financing for vulnerable actors through tailored mechanisms (such as microcredit, leasing, and revolving funds), enabling the scaling of solutions without relying exclusively on public funding or donor resources. This approach mobilizes private investment and promotes financial sustainability beyond the project lifecycle.
 95. A preliminary quantitative assessment further illustrates the potential economic benefits of the proposed investments. Assuming that approximately 50,000 tonnes of perishable products per year benefit from improved cold-chain systems, an indicative baseline post-harvest loss rate of 30%, and a conservative 20% reduction in those losses, the project could avoid approximately 3,000 tonnes of food losses annually. The assumed volume is based on an indicative portfolio of approximately 30 financed subprojects, including aggregation centres, cold-storage facilities, dairy cooling systems, fisheries cooling systems and refrigerated transport solutions, with an average throughput of approximately 1,500-2,000 tonnes per year per subproject. The resulting annual volume under improved cold-chain management therefore represents only around 1.5% of Bolivia's annual production of perishable products. Using indicative producer prices of USD 500-700 per tonne, the avoided losses correspond to approximately USD 1.5-2.1 million per year in recovered value. These benefits are illustrative and will be validated through detailed value-chain assessments and cost-benefit analyses during the Project Formulation Grant (PFG) phase.
 96. The project was also assessed against two alternative approaches. Alternative A, consisting primarily of investments in agricultural production without addressing post-harvest losses, would increase food production but would not address the growing losses associated with climate change, resulting in continuing inefficiencies and reduced food availability. Alternative B, based on conventional refrigeration systems using high-GWP refrigerants and grid-powered solutions only, would involve higher operating costs, greater exposure to energy supply disruptions and reduced suitability for remote and climate-vulnerable regions. In contrast, the proposed approach combines climate-resilient cooling technologies, sustainable refrigerants, decentralized and renewable-energy-based solutions where appropriate, capacity development and sustainable financing mechanisms. As a result, it is expected to provide a more cost-effective and climate-resilient response to the identified adaptation challenge while generating additional social, environmental and food-security benefits. A full comparison of alternatives will be undertaken during the PFG phase as part of the detailed cost-benefit analysis.
 97. Finally, the territorial and targeted approach—focused on highly vulnerable populations—ensures that resources are allocated where they yield the greatest marginal benefits in terms of climate resilience, preservation and availability of perishable products, resilient livelihoods, and poverty reduction. This maximizes impact per unit of investment, in alignment with the efficiency principles of the Adaptation Fund. Overall, the project is cost-effective because it: (i) reduces losses rather than requiring increased production; (ii) leverages existing infrastructure and systems; (iii) lowers operational costs through efficient technologies; (iv) strengthens local capacities to ensure sustainability; and (v) delivers economic, social, and environmental co-benefits through a single integrated

investment.

D. Describe how the project/programme is consistent with national or sub-national sustainable development strategies, including, where appropriate, national adaptation plan (NAP), national or sub-national development plans, poverty reduction strategies, national communications, or national adaptation programs of action, or other relevant instruments, where they exist.

98. The proposed project is strongly aligned with Bolivia's NDC 3.0, 2026-2035, which identifies climate adaptation as a national priority and highlights the vulnerability of agricultural and food systems to increasing temperatures, droughts, floods, extreme events, and climate variability. The NDC prioritizes strengthening resilient productive systems, reducing climate-related losses, improving food security, enhancing risk management, and increasing the resilience of vulnerable populations.
99. The project is further aligned with Bolivia's Plurinational Climate Change Policy (PPCC, 2023), which provides the country's overarching climate policy framework and promotes adaptation, resilience-building, sustainable productive systems, and risk reduction in climate-sensitive sectors. By strengthening cold chain systems and reducing vulnerabilities associated with increasing temperatures and climate variability, the project contributes to the PPCC's objectives of enhancing adaptive capacity and strengthening climate resilience in productive and food systems.
100. Bolivia is currently developing its National Adaptation Plan (NAP) with support from the Green Climate Fund and technical assistance from GIZ. While the NAP has not yet been formally adopted, the process emphasizes strengthening adaptation planning, climate risk governance, resilient infrastructure, and adaptation in productive sectors. ADAPT-COOL will coordinate with the national adaptation planning process and incorporate relevant priorities and guidance emerging from the NAP during project implementation.
101. The project is also consistent with national priorities for productive development and food security. In particular, it supports the objectives of the Strategic Plan 2026-2030 "Bolivia Productiva y Resiliente", which promotes resilient productive systems, strengthened agro-productive value chains, improved logistics and market access, technological innovation, and sustainable rural development. ADAPT-COOL complements investments in agricultural production by addressing critical post-harvest bottlenecks related to storage, refrigeration, preservation, and distribution, thereby protecting the value of production already achieved and improving market integration.
102. The project is further aligned with Law No. 144 on the Community Agricultural Productive Revolution, which promotes food security and sovereignty, productive infrastructure, and resilient agricultural systems, as well as Law No. 338 on Sustainable Family Farming, which supports community-based and family farming organizations. In addition, the project contributes to the objectives of Bolivia's Food and Nutrition Policy (DS N.º 2167), which seeks to improve food availability and access, reduce food losses, and strengthen food security and nutrition outcomes.
103. The project is implemented within the framework established by Law No. 777 on the Comprehensive State Planning System (SPIE), which governs the articulation of national, sectoral, territorial, and institutional planning instruments. Bolivia is currently transitioning toward the new national planning cycle (2026-2030); accordingly, the project will maintain consistency with newly approved planning instruments as they become operational and will verify alignment with relevant territorial planning instruments at the subproject level once investment locations are defined.
104. Finally, the project's sustainable cooling approach is consistent with Bolivia's commitments under the Montreal Protocol and the Kigali Amendment. The project will promote energy-efficient cooling technologies and prioritize low-global-warming-potential refrigerants and sustainable cooling practices, where technically, economically, and operationally feasible, while ensuring appropriate safety, maintenance, and lifecycle

management measures.

E. Describe how the project/programme meets relevant national technical standards, where applicable, such as standards for environmental assessment, building codes, etc., and complies with the Environmental and Social Policy of the Adaptation Fund.

105. The project will comply with applicable national legal, regulatory, and technical requirements related to environmental management, territorial planning, food safety, refrigeration systems, occupational health and safety, Indigenous Peoples, and sustainable cooling technologies. As summarized in Table 10, all proposed subprojects will undergo a screening process to identify applicable permitting, licensing, environmental, social, and technical requirements. In this context, UNIDO and CAINCO, through the Technical and Financing Facility, will use these requirements during the appraisal process to inform, guide, and advise potential beneficiaries before and during subproject application and development. While responsibility for obtaining and maintaining compliance with applicable national regulations remains with the subproject beneficiaries, the Facility will verify compliance requirements during subproject screening, approval, and implementation. In line with the Adaptation Fund Environmental and Social Policy, all project activities will also be screened for environmental and social risks and impacts and, consistent with the project's Category B classification, appropriate safeguard instruments, including Environmental and Social Impact Assessments (ESIAs) and Environmental and Social Management Plans (ESMPs), will be prepared as required. During the PFG phase, a Gender Action Plan (GAP), measures for the inclusion of Indigenous Peoples, and location-specific compliance and safeguard requirements will be further developed and integrated into project implementation arrangements for the priority territories and investments selected.

Table 9 National Regulatory Requirements Applicable to Project Activities

Regulatory Area	Main Regulation / Reference	Competent Authority	Steps required for compliance
Territorial Planning and Land Use	Law No. 777 (SPIE); PTDI/PGTC; land-use planning instruments; Law No. 031	SPIE Governing Authority; Autonomous Departmental and Municipal Governments	All subprojects will be screened to verify consistency with applicable territorial planning instruments, land-use regulations and municipal requirements before approval.
Environmental Licensing	Environmental Law No. 1333; DS No. 24176 and amendments	National or Departmental Environmental Authority	Requires screening and determination of the applicable environmental instrument (FNCA, IRAP, EEIA, PPM-PASA, etc.). Environmental categorization, ESIA/ESMP preparation and environmental authorization will be completed before implementation.
Protected Areas	Environmental Law No. 1333; SERNAP procedures	SERNAP and relevant subnational authorities	Site screening will verify whether investments are located within or near protected areas. Required approvals and environmental measures will be obtained prior to implementation.
Land Tenure and Rural Properties	Laws No. 1715 and 3545; DS No. 29215	INRA	Ownership, land tenure status and legal rights to use project sites will be verified prior to investment approval.
Agricultural Health and Food Safety	Law No. 830; SENASAG regulations	SENASAG	Cold storage, processing, transport and food handling activities will comply with applicable food safety, hygiene, storage, traceability and

			sanitary requirements.
Food Transport	Law No. 830 and specific SENASAG regulations	SENASAG and competent transport authorities	Refrigerated transport financed by the project will comply with vehicle registration, temperature-control and food-safety requirements.
Waste Management	Law No. 755; DS No. 2954	Environmental authorities and local governments	Waste management measures will be applied, including appropriate handling and disposal of refrigerants, oils, batteries, packaging and RAC equipment.
Risk Management and Climate Resilience	Law No. 602; DS No. 2342	National and subnational risk-management authorities	Climate and disaster risk assessments will be incorporated into site selection, infrastructure design and operational planning.
Occupational Health and Safety	Decree Law No. 16998 and applicable OHS regulations	Ministry of Labour	Installation and operation of cold-chain equipment will comply with occupational health and safety requirements, including training, PPE and safety procedures, when applicable.
Electrical Installations	NB 777:2024	IBNORCA and competent electricity authorities	Electrical installations will comply with national technical and safety requirements prior to commissioning.
Refrigerants and Controlled Substances	DS No. 27421; DS No. 27562; CGO regulations	Governmental Ozone Commission (CGO)	The project will prioritize low-GWP refrigerants and ensure compliance with national controls on refrigerants, HCFCs and HFCs.
Refrigeration Technicians and Companies	RENTRAA regulations	CGO	Installation and servicing of refrigeration systems will be performed by qualified and certified technicians and service providers.
Importation of Refrigeration Equipment	DS No. 572; IBMETRO procedures	IBMETRO, National Customs Authority, CGO	Imported refrigeration equipment will comply with applicable IBMETRO certification requirements, customs procedures, and national controls on controlled refrigerants and equipment.
Indigenous Peoples and Consultation	Constitution; Law No. 1257 (ILO 169); Law No. 3760	Competent authorities and Indigenous authorities	Indigenous Peoples screening, culturally appropriate consultations and FPIC procedures will be implemented through the ESMP and project safeguard procedures, in line with AF ESP.

F. Describe if there is duplication of project/programme with other funding sources, if any.

106. A review of major climate adaptation initiatives currently under implementation in Bolivia was undertaken to identify potential areas of overlap, complementarity and opportunities for collaboration. The analysis confirms that while several programmes support resilient agricultural production, irrigation infrastructure, climate adaptation, producer organisations, innovation ecosystems and sustainable refrigeration, no existing initiative addresses climate-resilient cold chains through an integrated approach combining food recovery systems, technical assistance and sustainable financing mechanisms.

Table 10 Relevant projects/initiatives identified by Bolivia's RENAPP implemented in Bolivia

Project	Years	Donor / Implementing Agency	Budget (USD)	Main Objective	Relationship with ADAPT-COOL
Programme for Country Partnership for Bolivia	2026-2030	UNIDO	21,873	Support the efforts in the transformation of the productive matrix and promotion of sustainable and inclusive industrial development in priority sectors.	Directly contributes to the PCP's vision of promoting sustainable, resilient and competitive productive systems while supporting climate adaptation, food security, and value-chain development.
Portfolio of Montreal Protocol ⁶	Ongoing-2031	UNIDO / CGO/ RENTRAA Framework	1,1 million	Promote transition to low-GWP refrigerants, strengthen regulations and certify refrigeration technicians in line with the Montreal Protocol and Kigali Amendment.	Direct technical complementarity. Supports environmentally sustainable refrigeration technologies, certified technicians and long-term operation and maintenance of cooling systems financed by ADAPT-COOL.
Food Bank of Bolivia Strengthening and Logistics Expansion Initiatives	Ongoing	Food Bank of Bolivia and private sector	N/A	Recover and redistribute food to vulnerable populations while strengthening logistics and storage capacities.	Strong complementarity with Component 3. ADAPT-COOL aims to address identified cold-chain and storage limitations, improving food recovery and redistribution systems.
RECEM Valles: Increasing the Climate Resilience of Vulnerable Rural Communities and Agroecosystems in the Valles Region	2024-2029	GCF / FAO	63.3 million	Strengthen climate resilience through ecosystem-based adaptation, climate-smart agriculture, irrigation, climate information services, and adaptive financing mechanisms.	Strong complementarity. Works on climate-resilient production systems and adaptation but does not address post-harvest management or cold-chain infrastructure. Potential source of beneficiaries, producer organizations and territorial coordination.
ACCESOS Rural and AGROSUSTENTAR Programme	Ongoing / 2032	IFAD / APROCAM (Bolivian Gov)	51.1 million	Co-finance climate adaptation subprojects, strengthen rural markets and value chains, and improve livelihoods of smallholder producers through technical assistance and productive investments.	High complementarity and beneficiary overlap. A potential source of organized producer groups and co-investment opportunities. No dedicated cold-chain component.
PAR III - Resilient Food Systems Innovation Project	Ongoing-	World Bank / EMPODERA R - MDRyT	300 million	Finance productive infrastructure, productive alliances, climate-smart agriculture and market integration of rural producers.	Territorial and beneficiary synergies. Potential coordination of investments and producer organizations. Complements ADAPT-COOL by addressing production systems rather than post-harvest cold-chain infrastructure.
Resilient Water Management for Family and Community	2024-2030	World Bank	N/A	Improve water security through watershed protection, irrigation efficiency and climate-resilient water infrastructure for rural	Complements upstream production systems and strengthens climate resilience of agricultural production. Does not address post-harvest losses or

⁶ Projects within UNIDO's Montreal Protocol portfolio in Bolivia: 230320 - Preparation of a national inventory of banks of used or unwanted controlled substances; 180341 - HCFC phase-out management plan (Stage II); 210185 - Kigali Implementation Plan Stage I; 230345 - Pilot project to maintain and/or enhance the energy efficiency of replacement technologies and equipment in the context of HFC phase-down (non-investment activities).

Irrigation				communities.	food distribution systems.
Advanced Irrigation Programme / Water and Irrigation for Bolivia	Ongoing	CAF	35 million	Expand climate-resilient irrigation infrastructure, strengthen water-user organizations and improve agricultural productivity.	Complements ADAPT-COOL by increasing production volumes that subsequently require improved storage and cold-chain management. Potential geographic coordination opportunity.
Agro-INNOVATEC Innovation Platform	2024-2026	UNDP, GIZ/Euroclima, Ayuda en Acción, BDP-SAM	N/A	Support innovation and entrepreneurship for climate adaptation in agriculture, including agrometeorology, renewable energy, regenerative agriculture and digital solutions.	Potential source of scalable technologies and locally validated solutions applicable to sustainable cooling and post-harvest management.
Competitive Fund for Producer Organizations and Climate Resilience (FFF Mechanism)	Ongoing	FAO / MDRyT	300,000	Provide direct financing to producer organizations for climate resilience, sustainable landscape management and gender-responsive initiatives.	Potential complement through beneficiary organizations, pilot interventions and community-level scaling mechanisms.
Strengthening Climate-Resilient Agriculture in Bolivia	Ongoing	AFD / CIPCA / Secours Catholique	N/A	Promote climate-resilient agroecological production systems, strengthen Indigenous and smallholder livelihoods, and support knowledge generation for climate adaptation.	Complementary through climate-resilient production models and community-based adaptation approaches. Collaboration opportunities regarding knowledge generation for climate adaptation.

Note: The amounts and implementation status are based on information publicly available up to August 2026 compiled by RENAPP and shall be verified directly with each implementing body before being cited in the full proposal to the Adaptation Fund.

G. If applicable, describe the learning and knowledge management component to capture and disseminate lessons learned.

107. The project incorporates a robust learning and knowledge management component aimed at capturing, systematizing, and disseminating lessons learned, best practices, and results generated throughout implementation, in order to facilitate the replicability, scalability, and sustainability of interventions.
108. First, component 4 establishes specific monitoring, evaluation, and knowledge management functions, led by the implementing entity. This enables the generation of systematic evidence on project performance, the identification of key lessons, and the documentation of relevant experiences across different territorial contexts. This information will be used to inform decision-making during implementation and to continuously improve the effectiveness of interventions
109. The capacity-building component also plays a central role in knowledge management through training processes, technical assistance, and hands-on learning activities targeting producers, operators, technicians, and local organizations, through component 2, whereby component 1 focuses more on public stakeholders. This approach promotes local ownership of knowledge, facilitates its application in real-world contexts, and contributes to the sustainability of results.
110. In addition, the dissemination and awareness-raising component enhances knowledge sharing through community campaigns, participatory workshops, training of local facilitators, and the development of accessible and culturally appropriate educational materials. It also includes the development of technical tools and knowledge products, such as guidelines, operational manuals, post-harvest and cold chain management protocols, and management models, which will be made publicly available on the national platform on Sustainable Cooling in Food Systems and UNIDO website. These products

not only support project implementation but also serve as key inputs for knowledge transfer to other stakeholders, territories, and programmes. Their design and dissemination will incorporate an intercultural approach, considering the cultural, linguistic, and contextual specificities of each region and target population, in order to ensure their relevance, accessibility, and effective uptake by vulnerable groups, including rural communities, women, and indigenous peoples.

111. Furthermore, spaces for exchange and dialogue among stakeholders, including communities, the public sector, the private sector, and civil society organizations, will be promoted to facilitate collective learning, the identification of innovations, and the dissemination of successful experiences. These spaces will also strengthen system governance and support the integration of knowledge into public policies. Overall, this comprehensive knowledge management approach ensures that the project's lessons learned not only benefit direct participants but also generate broader and more sustainable impacts over time.
112. The project will adopt an adaptive learning approach whereby training activities, awareness campaigns, and knowledge products will be periodically evaluated through participant feedback surveys, stakeholder consultations, focus group discussions, and user engagement monitoring. Feedback received will be systematically incorporated into the revision of training materials, technical guidance, communication products, and dissemination strategies to improve their effectiveness, relevance, and accessibility for different beneficiary groups. UNIDO will support this process through the application of established monitoring, evaluation, learning, and capacity-development methodologies, including standardized participant feedback templates, training evaluation tools, knowledge capture formats, and lessons-learned processes to ensure continuous improvement throughout implementation.

H. Describe the consultative process, including the list of stakeholders consulted, undertaken during project preparation, with particular reference to vulnerable groups, including gender considerations, in compliance with the Environmental and Social Policy and Gender Policy of the Adaptation Fund.

113. In this initial phase, preliminary consultations and coordination mechanisms have been undertaken with key stakeholders from both the public and private sectors to inform the conceptual design of the proposal. In particular, technical exchanges and consultations have been conducted with the Directorate of Climate Change, and within the Vice Ministry of Environment, Biodiversity, Climate Change and Forest Management and Development, including the Governmental Ozone Commission, and with the Chamber of Industry, Commerce, Services and Tourism of Santa Cruz (CAINCO). These stakeholders have provided strategic inputs for the identification of priorities, opportunities for coordination, and the feasibility of the proposed interventions. In addition, UNIDO has provided guidance and support in its role as implementing entity. These consultations have enabled the definition of key elements for the initial project structuring, as outlined in the table below. Records of consultations are provided in Annex I.

Table 11 Preliminary consultations undertaken during concept development from April - May 2026

Date	Institution(s)	Participants	Gender	Main Issues Discussed	Influence on Project Design
02 April 2026	CGO, VMA, UNIDO	5 participants (4 CGO/VMA, 1 UNIDO)	2 women, 3 men	Climate-resilient cold chains, adaptation priorities, sustainable refrigeration, energy efficiency, territorial approach, post-harvest losses	Reinforced positioning of resilient cold chains as a climate adaptation measure; inclusion of low-GWP refrigeration, adaptation focus, territorial approach, and reduction of post-harvest losses.

23 April 2026	CGO, VMA, UNIDO	5 participants (4 CGO/VMA, 1 UNIDO)	2 women, 3 men	Capacity gaps, operation and maintenance needs, technology selection criteria, financing barriers, natural refrigerants, sustainability of investments	Strengthened Component 2 (capacity building), added focus on technical training, financing access, operation and maintenance, and climate-friendly technologies.
05 May 2026	CGO, VMA, UNIDO (including review of exchanges with CAINCO)	4 participants (3 CGO/VMA, 1 UNIDO)	2 women, 2 men	Public-private partnerships, financing mechanisms, governance structure, gender considerations, vulnerable groups, private sector engagement	Strengthened Component 3 financing facility, inclusion of CAINCO, public-private partnerships, women and vulnerable groups considerations, and governance arrangements.

114. However, by means of the Project Formulation Grant phase, a more comprehensive, in-depth, and structured consultation process will be undertaken. This process will ensure more active and systematic engagement of additional key stakeholders, including producer organizations, cooperatives, rural and indigenous communities (IP consultations), women producers, as well as the Food Bank of Bolivia and social organizations involved in food distribution. This approach will ensure the effective incorporation of their needs, knowledge, and priorities, while strengthening gender equality and social inclusion considerations.
115. After the Project Formulation Grant phase, the documentation related to the consultation process will be made available, including the identification of stakeholders consulted, methodologies applied, consultation timelines, and key inputs received. This process will be carried out in full compliance with the Environmental and Social Policy and the Gender Policy of the Adaptation Fund.

I. Provide justification for funding requested, focusing on the full cost of adaptation reasoning.

116. The requested financing is justified by the need to cover the **full cost of adaptation** required to address climate-induced risks affecting Bolivia's agri-food systems, particularly in highly vulnerable regions such as the Altiplano, Valleys, and Eastern/Amazon areas. In these regions, rising temperatures, climate variability, extreme events, and logistical disruptions are already increasing post-harvest losses, reducing food quality, and limiting access to food, disproportionately affecting smallholder farmers, Indigenous Peoples, and rural communities.
117. Under the **baseline scenario**, food systems will continue to operate with limited and fragmented cold chain infrastructure that is not designed to withstand increasing climate stress. Preservation relies largely on traditional practices with insufficient refrigeration capacity, weak thermal protection, and unreliable energy supply. Future climate conditions are expected to exacerbate these constraints, leading to higher food losses, reduced incomes, and increased food insecurity. Baseline investments would likely remain focused on conventional infrastructure gaps, without integrating climate risk considerations, territorial adaptation approaches, or technologies suited to higher temperatures and variability. As such, they would not be sufficient to ensure the functionality of food systems under projected climate conditions.
118. The proposed project represents the **adaptation scenario**, introducing climate-resilient cold chain systems specifically designed to withstand current and future climate risks. These include energy-efficient and low-GWP refrigeration technologies, decentralised and renewable energy solutions, climate-resilient logistics, and infrastructure adapted to diverse agroecological conditions. The project also integrates climate risk analysis, environmental and social safeguards, and capacity-building measures to ensure the sustainability of investments.
119. The difference between these two scenarios constitutes the **incremental cost of**

adaptation, which cannot be financed through conventional development funding. These costs include, inter alia:

- climate-resilient and energy-efficient cooling technologies;
- renewable and decentralised energy systems to address power instability;
- infrastructure adapted to extreme temperatures and climate variability;
- climate-informed logistics and territorial solutions;
- technical capacities for operation and maintenance under changing climate conditions; and
- integration of climate risk assessments and environmental and social safeguards.

120. These adaptation-specific investments are essential to ensure the long-term performance and resilience of cold chain systems under climate change, delivering direct benefits such as reduced post-harvest losses, improved food availability, and stabilized livelihoods. Additional costs also arise from creating an enabling environment for adaptation, including policy strengthening, standards, coordination mechanisms, and inclusive financing models that allow vulnerable actors to adopt climate-resilient technologies. Knowledge management and learning systems further support sustainability and scalability. Without Adaptation Fund support, these measures would not be implemented due to high upfront investment costs, limited access to finance, and high perceived risks, particularly in underserved and climate-vulnerable regions. Adaptation Fund resources are therefore critical to cover incremental adaptation costs; de-risk investments and catalyse private sector participation; and ensure equitable access to adaptation solutions for vulnerable populations.
121. The requested USD 10 million represents the **minimum investment required to deliver a comprehensive and scalable adaptation response** across priority regions and value chains. Climate-resilient cold chain systems are inherently capital-intensive, due to the need for energy-efficient refrigeration, integration of renewable and decentralized energy solutions, and infrastructure adapted to extreme temperatures and remote conditions. This funding level ensures deployment of end-to-end cold chain solutions, combined with financing mechanisms, capacity building, and policy support necessary to sustain adaptation benefits. The proposed amount therefore reflects an optimal balance between impact, feasibility, and value for money, ensuring meaningful resilience gains while maintaining strong implementation performance.
122. By targeting regions and populations with the highest exposure and vulnerability, the project maximises the effectiveness of adaptation finance, contributing to reduced food losses, improved incomes, and strengthened resilience of Bolivia's food systems under current and future climate conditions.
123. The project does not rely on co-financing from other donors for the achievement of its outcomes and outputs. All project activities, including the implementation of demonstration sub-projects, technical assistance, capacity-building activities, knowledge products, and monitoring and evaluation, are expected to be financed through the Adaptation Fund. Therefore, the project is fully capable of delivering its intended results independently of any parallel project or external funding source. Nonetheless, the project will benefit from important synergies with UNIDO's ongoing portfolio in Bolivia, particularly projects implemented under the Montreal Protocol and the Kigali Amendment. Through these initiatives, UNIDO has established strong partnerships with national institutions, producer organizations, technical training centers, research institutions, private-sector stakeholders, and the National Ozone Unit. The project will be able to leverage existing stakeholder networks, technical expertise, national and international specialists, institutional coordination mechanisms, and lessons learned from previous interventions, thereby enhancing implementation efficiency and outreach. The project is also aligned with the UNIDO Programme for Country Partnership (PCP) for the Plurinational State of Bolivia 2026-2030, which seeks to support Bolivia's efforts to transform its productive matrix and promote sustainable and inclusive industrial development in priority sectors.

The PCP provides a broader strategic framework for engagement with national institutions and development partners and facilitates alignment with national development priorities.

J. Describe how the sustainability of the project/programme outcomes has been taken into account when designing the project/programme.

124. The sustainability of the program's results has been incorporated as a cross-cutting criterion from the design phase, through an approach that integrates technical, financial, institutional, social, and environmental dimensions of sustainability. In particular:
125. **Technical and operational sustainability.** Climate-resilient cold-chain equipment financed through the project's Technical and Financing Facility (Component 3) will be procured and managed by CAINCO, acting as the Executing Entity, in accordance with UNIDO procurement and project implementation procedures. Beneficiaries will be selected through the competitive facility mechanism and will enter into agreements defining their responsibilities regarding asset use, operation, maintenance, and reporting. Following installation and commissioning, beneficiaries will receive technical training on the operation, maintenance, and safe use of the equipment. In addition, Component 2 will strengthen local technical capacities through the training of refrigeration technicians and service providers, ensuring that beneficiaries have access to qualified maintenance services throughout the lifetime of the equipment. Ownership transfer arrangements will follow an approach similar to that applied by UNIDO under Montreal Protocol projects. Once the equipment has been delivered, installed, commissioned, and verified as operational, a formal asset transfer process will be undertaken. An asset transfer and acceptance certificate will be signed between CAINCO, the relevant government counterpart (CGO/VMA), and the final beneficiary, transferring ownership of the equipment to the beneficiary.
126. **Capacity development and local ownership.** The project adopts a comprehensive capacity development approach through technical training programs, continuous technical assistance, and organizational strengthening, aimed at fostering effective ownership among producers, operators, and communities. Training activities will focus on building competencies in operation, preventive maintenance, and post-harvest management, as well as in the efficient management of infrastructure and cold chain systems. This approach enhances long-term sustainability by strengthening the technical and organizational autonomy of local actors, enabling them to manage the implemented systems efficiently and sustainably.
127. **Financial sustainability.** Financial sustainability will be promoted through inclusive financing mechanisms designed to ensure affordability, cost recovery, and scalability. In collaboration with CAINCO and national financial institutions, the project will support the development of financing mechanisms for climate-resilient cold chain investments, including options such as revolving funds and tailored credit facilities. Approximately USD 1 million will be used to catalyse investments among vulnerable producers, cooperatives, SMEs and food recovery organisations, while partnerships with at least two financial institutions will seek to mobilise an additional USD 1 million in loans. By embedding cold-chain finance within national financial institutions, the project will create a sustainable pathway for continued adoption and scaling of resilient cooling solutions beyond the project lifetime.
128. **Institutional sustainability and governance.** Institutional continuity will be achieved by embedding project coordination within existing institutions rather than creating a stand-alone mechanism. The project will build on the established collaboration among the Vice Ministry of Environment, Biodiversity, Climate Change and Forest Management and Development (VMA), the Governmental Ozone Commission (CGO), and UNIDO.
129. The project's multisectoral coordination platform (Component 1) will be convened by

- UNIDO, the VMA and CGO, with active participation from CAINCO, producer organizations, financial institutions, and other stakeholders. During implementation, coordination will be supported by a project coordinator embedded within the VMA, helping to institutionalize processes and ensure government ownership. To formalize collaboration beyond the project period, the participating institutions will explore the signature of a Memorandum of Understanding (MoU) or similar cooperation instrument defining roles, responsibilities, and continued collaboration on sustainable cold chain development.
130. The choice of CAINCO as Executing Entity (Component 3) is a key institutional sustainability measure. As Bolivia's leading private-sector organization, CAINCO will continue to promote business engagement, facilitate access to financing opportunities, organize forums and knowledge exchanges, and connect companies with financial institutions and development partners after project completion. This will help maintain momentum for investment and replication of climate-resilient cold chain solutions.
 131. In addition, the national platform on Sustainable Cooling in Food Systems will remain available beyond the project lifetime. It will be integrated into the digital infrastructure of either the VMA or CAINCO to ensure long-term accessibility and local use, serving as a repository for technical guidance, case studies, lessons learned, financing opportunities, and information on sustainable cooling technologies, supporting continued knowledge sharing and stakeholder engagement after project closure.
 132. **Social sustainability and inclusive participation.** The project promotes inclusive, equitable, and meaningful participation of women, Indigenous Peoples, and vulnerable communities across all stages of implementation, including training, governance, decision-making, and management processes. Targeted measures will promote equitable access to technologies, finance, and economic opportunities while strengthening local organisational capacities. ESS will be systematically applied to ensure that interventions are socially inclusive, culturally appropriate, and environmentally sound.
 133. **Awareness-raising and behavioral change.** The communication and education component strengthens knowledge, attitudes, and practices related to climate resilience and resilient food systems, and climate-adapted post-harvest management, fostering sustained behavioral changes among beneficiaries and consolidating long-term impacts.
 134. **Knowledge generation, replication, and scaling.** The monitoring and evaluation system will generate evidence on the effectiveness of climate-resilient cold chain solutions and community-based food distribution systems. Lessons learned, technical guidelines, and best practices will be documented and disseminated among national and regional stakeholders.
 135. **Environmental sustainability.** Climate-resilient infrastructure and improved post-harvest management practices will contribute to reducing food loss and waste, increasing resource efficiency, and lowering greenhouse gas emissions associated with such losses. Where feasible, the project will prioritize energy-efficient refrigeration technologies and the use of refrigerants with low GWP that do not deplete the ozone layer, thereby reducing negative impacts on the climate and the atmosphere.
 136. Overall, these elements ensure that project results are not only sustained over time, but can also be scaled up and replicated, contributing consistently to climate resilience and resilient food systems, and the preservation and availability of perishable products in Bolivia.

K. Provide an overview of the environmental and social impacts and risks identified as being relevant to the project/programme.

137. The project has undergone an initial environmental and social risk (E&S) assessments in line with Adaptation Fund's Environmental and Social (E&S) Policy and Gender Policy and UNIDO Environmental and Social Safeguards Policy and Procedures. As a result, the project has been classified as a category B project. The proposed project is likely to

have small impacts on human populations or the environment. Likely impacts will be few in number, site-specific, and few if any will be irreversible. As per the AF policy an Environmental Social Impact Assessment (ESIA) will be developed which will inform the Environmental and Social Management Plan (ESMP) prepared for the project. The initial screening of risks against AF 15 principles is presented in the table below.

Table 12 Preliminary Environmental and Social Risk Screening Against the 15 Adaptation Fund Principles

Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
<i>Compliance with the Law</i>		Risk: Low In Bolivia, environmental assessment requirements are defined under Law No. 1333, which classifies activities into four categories based on their potential impacts. Most subprojects (e.g. small-scale cold storage, refrigeration systems, upgrading of existing facilities) are expected to fall under Categories 2 and 3, requiring either specific EIAs or Environmental Management Plans. Mitigation: During the PFG phase, an Environmental and Social Management Plan (ESMP) will be developed to provide a framework for screening, categorisation, mitigation, and compliance of all subprojects, ensuring full alignment with national regulations and UNIDO ESSPP requirements. Compliance with applicable environmental, construction, electrical, refrigeration, occupational safety, food-safety and municipal regulations will be verified during project implementation and monitored throughout the project lifecycle. All subprojects will undergo environmental and social screening to determine applicable permitting, licensing, and regulatory requirements prior to approval.
<i>Access and Equity</i>		Risk: Low Risk of unequal access to project benefits, particularly among remote, low-income, or underserved populations. Mitigation: The project will apply targeting criteria prioritising vulnerable territories, inclusive financing mechanisms (USP), and proactive outreach strategies. These measures will be further detailed in the ESMP and operational manual during the PFG phase to ensure equitable participation across all subprojects.
<i>Marginalized and Vulnerable Groups</i>		Risk: Low Smallholder farmers, women, and Indigenous Peoples may face barriers to participation due to structural inequalities. Mitigation: The project integrates targeted outreach, inclusive capacity-building, and culturally appropriate approaches, including prioritisation in beneficiary selection. These measures will be systematised during the PFG phase within the ESMP and Gender Action Plan, ensuring consistent application across USPs.
<i>Human Rights</i>		Risk: Very Low The project is expected to generate positive impacts through improved food security, livelihoods, and access to climate-resilient infrastructure. Mitigation: Continuous monitoring will ensure that project activities remain consistent with human rights principles, including non-discrimination, equitable access to project benefits, meaningful participation, and grievance redress

		mechanisms.
<i>Gender Equality and Women's Empowerment</i>		Risk: Low Risk of unequal participation in access to resources and decision-making. Mitigation: A gender-responsive approach will ensure at least 40% participation of women, supported by a Gender Action Plan (GAP) to be developed during the PFG phase. The GAP will define targets, indicators, and accountability mechanisms applicable to all subprojects.
<i>Core Labour Rights</i>		Risk: Low Risks include exposure to refrigerants, electrical hazards, and equipment handling during installation and maintenance. Mitigation: • Engagement of certified and qualified technicians • Compliance with ISO 5149 and international OHS standards • Implementation of strict occupational health and safety (OHS) protocols • Structured capacity-building, where certified technicians train local operators UNIDO will leverage its experience from the Montreal Protocol and Kigali Amendment, including established safety protocols, certification systems, and technical training networks. Compliance with labour rights, occupational health and safety requirements, contractor management procedures, and working conditions will be monitored throughout project implementation and incorporated into contractor agreements, procurement procedures, and supervision arrangements. These provisions will be further detailed during the PFG phase within the ESMP, defining minimum OHS standards and procedures for all subprojects. All activities will comply with national labour legislation and ILO standards, ensuring non-discrimination, fair treatment, and safe working conditions.
<i>Indigenous Peoples</i>		Risk: Medium Indigenous Peoples are present throughout the proposed intervention areas and may represent a significant proportion of project beneficiaries. Potential risks include inadequate consultation, insufficient consideration of traditional practices and governance structures, inequitable access to project benefits, and unintended impacts associated with the siting and operation of cold-chain infrastructure. Mitigation: • Application of Free, Prior and Informed Consent (FPIC) principles • Culturally appropriate engagement processes • Screening of all USPs and investment sites for Indigenous Peoples presence and potential impacts; • Dedicated Indigenous Peoples assessment during the PFG phase OS 4 requirements will be fully operationalised through the ESMP, which will establish a framework for consultation, inclusion, benefit-sharing, and FPIC compliance across all subprojects (USPs).

<i>Involuntary Resettlement</i>	X	No land acquisition or resettlement is expected, as infrastructure will be small-scale and implemented on existing sites.
<i>Protection of Natural Habitats</i>	X	The project does not involve habitat conversion or large-scale construction. Activities will be implemented in existing agricultural or urban areas. Site screening will ensure avoidance of sensitive ecosystems.
<i>Conservation of Biological Diversity</i>	X	No negative impacts on biodiversity are expected. The project may generate indirect positive effects by reducing pressure on production systems through decreased food loss.
<i>Climate Change</i>		Risk: Low Potential risk of maladaptation or use of inefficient technologies. Mitigation: Integration of climate-informed design criteria, resilient technologies, and climate risk screening. These requirements will be embedded in the ESMP and USP selection criteria during the PFG phase.
<i>Pollution Prevention and Resource Efficiency</i>		Risk: Low to Moderate Risks relate to refrigerant use, emissions, and energy consumption. Mitigation: • Deployment of energy-efficient technologies (ISO 50001 alignment) • Use of low-GWP refrigerants, consistent with the Montreal Protocol and Kigali Amendment • Implementation of safe refrigerant handling, storage, and disposal procedures • Promotion of renewable and decentralised energy solutions • Potential impacts associated with refrigerant leakage, waste equipment, batteries, lubricants, and end-of-life disposal will be assessed during USP screening. Activities will be implemented by certified technicians, ensuring adherence to established safety and environmental standards. UNIDO will leverage its extensive experience under the Montreal Protocol, including established technical networks, certification schemes, and operational procedures. These measures will be formalised in the ESMP during the PFG phase, serving as a reference framework for resource efficiency and pollution prevention across all subprojects.
<i>Public Health</i>		Risk: Low Risks relate to food safety, cold chain failure, and exposure to refrigerants. Mitigation: • Compliance with national and international food safety standards • Application of refrigeration safety standards (e.g. ISO 5149) • Delivery of training programmes on safe food handling and system operation • Ensuring all systems are operated by trained personnel and certified technicians These requirements will be included in the ESMP and capacity-building framework. Hazard Analysis and Critical Control Point (HACCP) principles and applicable food-safety protocols will be promoted where relevant.

<i>Physical and Cultural Heritage</i>		Risk: Very Low The final locations of project-supported infrastructure are not yet known. While no impacts are currently anticipated, given that this is not an infrastructure project and technology solutions are to be requested by the communities (instead of governments selecting location), there remains a minor possibility that future investment sites could be located near physical or cultural heritage assets. Mitigation: Screening of all USPs and investment sites for Indigenous Peoples presence and potential impacts;
<i>Lands and Soil Conservation</i>		Risk: Low No significant impacts on land or soil resources are expected, as the project does not involve land-use change, large-scale construction, or activities affecting soil integrity. Interventions are limited to installation of small-scale infrastructure within existing sites. Mitigation: • Environmental screening of all investment sites; • Preference for existing facilities and previously disturbed land; • Avoidance of activities involving land conversion; • Inclusion of land management measures within the ESMP where relevant, including continuous monitoring.

138. Partially Unidentified Sub Projects (USPs)

139. The third component of the project will be implemented through a technical and financing facility—referred to by the Adaptation Fund as Unidentified Sub-Projects (USPs)—which will provide competitive financing to eligible beneficiaries for the deployment and upgrading of climate-resilient cold chain solutions. Given the context-specific nature of cold chain systems, which vary according to value chains, climatic conditions, and market structures, a flexible USP approach is necessary to identify demand-driven and scalable adaptation investments. USPs are expected to include, inter alia, deployment of pre-cooling and cold storage systems; climate-resilient cold transport solutions; cooling systems for fisheries and dairy sectors in vulnerable communities; strengthening of food banks and community-based distribution systems (*Section A, paras. 72-74 for detailed information*). All interventions will prioritise energy-efficient technologies and low-global-warming-potential refrigerants, including natural refrigerants where feasible, and will be designed to operate effectively under projected climate conditions. The facility will target small-scale producers, cooperatives, MSMEs, agri-food value chain actors, food banks, and community organisations operating in climate-vulnerable territories. Particular emphasis will be placed on rural and Indigenous populations, women-led enterprises, and actors in fisheries and dairy sectors with limited access to infrastructure and finance. Where redistribution of recovered food is envisaged, the project will seek engagement with relevant food redistribution organisations, including the Food Bank of Bolivia, where appropriate; any redistribution targets will be confirmed subject to such engagement.
140. As final beneficiaries cannot be fully identified at this stage, sub-projects will be selected through a transparent and competitive call for proposals. This process will be implemented by CAINCO under the technical supervision and fiduciary oversight of UNIDO. A Steering Committee comprising representatives from the Vice-Ministry of Environment (VMA), UNIDO, and CAINCO will oversee evaluation and selection, based on technical, financial, environmental, and social criteria, with particular emphasis on climate adaptation relevance, gender responsiveness, and inclusion of vulnerable groups.
141. An Environmental and Social Management Plan (ESMP) will be developed during the Project Formulation Grant (PFG) phase to guide screening, risk management, and monitoring of sub-projects, as well as to define supervision arrangements for implementation. In parallel, the PFG phase will include a detailed assessment of priority

technologies, climate-vulnerable geographic areas, and target beneficiary groups. This will inform the design of financing windows and ensure that investments are aligned with national adaptation priorities and local needs.

142. Indigenous Peoples and Free, Prior and Informed Consent (FPIC)

143. As of 2025, LandMark estimates that Indigenous Peoples and local communities hold or use approximately 48.6% of the country's land (52.55 million hectares), although only 33.4% is formally recognized by the government. In parallel, an estimated 38.7% of the population self-identifies as Indigenous (2024 National Census), encompassing 36 distinct Indigenous Peoples officially recognized at the national level. These figures highlight the significant presence of Indigenous communities and underscore the critical importance of ensuring their rights—particularly the application of Free, Prior and Informed Consent (FPIC)—in land governance and development processes.

144. The project is fully consistent with the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) and will ensure respect for Indigenous Peoples' rights throughout design, implementation, and monitoring. In particular, it will operationalize the principle of Free, Prior and Informed Consent (FPIC) in line with the Adaptation Fund's Environmental and Social Policy.

145. During the Project Formulation Grant (PFG) phase, a dedicated Indigenous Peoples assessment will be conducted to identify the needs, roles and priorities of Bolivian Indigenous communities. Based on this assessment, culturally appropriate consultation processes will be carried out in accessible formats and local languages, ensuring that Indigenous Peoples can meaningfully participate in decision-making and provide or withhold their consent to project activities.

146. During implementation, Indigenous Peoples will be actively engaged as partners in adaptation actions through targeted capacity-building, participation in governance structures, and inclusion in community-based mechanisms. The project will ensure equitable access to benefits and incorporate traditional knowledge into climate-resilient solutions. A culturally appropriate grievance redress mechanism will also be established.

147. The project is expected to generate positive impacts by strengthening adaptive capacity, improving resilience of livelihoods, and enhancing food security, while respecting cultural practices and knowledge systems. Overall, the project embeds FPIC and inclusive approaches across all phases, ensuring alignment with UNDRIP and contributing to Indigenous Peoples' rights and self-determined development.

148. Gender Assessment

149. Gender inequalities in access to cold chain technologies and infrastructure constitute a significant barrier to effective climate adaptation in agri-food systems. Women are disproportionately involved in post-harvest activities—where cooling and preservation are critical—yet often lack access to productive assets, finance, technical support, and decision-making processes. This mismatch reduces the effectiveness of cold chain interventions and increases climate-related losses.

150. A preliminary Gender Assessment (Annex II) indicates that women, particularly in rural and Indigenous communities, face intersecting constraints, including limited access to infrastructure and financial services, underrepresentation in governance structures, and disproportionate unpaid care and post-harvest responsibilities. While women are concentrated in lower-value segments of value chains, they remain largely excluded from higher-value activities such as infrastructure ownership, logistics, and market integration. As a result, climate-related inefficiencies disproportionately affect their incomes, livelihoods, and food security. In response, the project adopts a gender-responsive approach aimed at improving women's access to, control over, and participation in climate-resilient cold chain systems. It will prioritise support for women-led enterprises and cooperatives, strengthen technical and entrepreneurial capacities, and promote their integration into higher-value segments of agri-food value chains.

151. During the Project Formulation Grant (PFG) phase, this analysis will be deepened through

a comprehensive gender assessment, including sex-disaggregated and intersectional data collection, value chain analysis, and stakeholder consultations. Participatory and gender-responsive methodologies will ensure that the specific needs and constraints of women and men are captured, with minimum participation thresholds to guarantee meaningful inclusion. The results will inform a Gender Action Plan (GAP) with clear targets, indicators, and accountability mechanisms to ensure systematic integration of gender equality and women's empowerment across the project.

152. **Environmental and Social Category of the Project/Programme:** Category B

PART III: IMPLEMENTATION ARRANGEMENTS

153. The present project is governed by the provisions of the Standard Basic Cooperation Agreement between the Plurinational State of Bolivia and UNIDO, signed on 1 December 1988. As endorsed by the Government of Bolivia, the project will be implemented with **UNIDO acting as the Implementing Entity (IE)**, providing overall technical oversight, fiduciary management, and ensuring compliance with Adaptation Fund requirements. At the national level, the project will be anchored within the **Vice-Ministry of Environment, Biodiversity, Climate Change and Forest Management and Development (VMA)**, which will serve as the main governmental counterpart and provide strategic direction, policy alignment, and coordination across public institutions.
154. The rationale for this implementation arrangement is based on UNIDO's long-standing experience and established presence in Bolivia, particularly through the successful implementation of projects under the Montreal Protocol. Over several years, UNIDO has worked closely with national institutions—including the Governmental Ozone Commission (CGO) and the Vice-Ministry of Environment—to support the phase-out of ozone-depleting substances and the transition towards sustainable cooling technologies. Through these interventions, UNIDO has developed strong technical expertise, built institutional relationships, and gained in-depth knowledge of the national regulatory framework, private sector landscape, and operational conditions related to refrigeration and cooling systems. This experience is directly relevant to the proposed project, which builds on similar technical domains and stakeholder networks. Furthermore, UNIDO's engagement under the Montreal Protocol has strengthened local capacities in areas such as refrigerant management, policy development, and private sector engagement, providing a solid foundation for expanding into climate adaptation through cold chain systems. Given the limited experience of national entities in implementing Adaptation Fund projects, UNIDO will provide execution and technical support to ensure compliance with AF requirements, while simultaneously strengthening national capacities to enable effective implementation and support future climate finance initiatives.
155. A key feature of the project's implementation structure is the establishment of a General Coordinator position, recruited by UNIDO and embedded within VMA. The General Coordinator will act as the central coordination point for all project activities and will facilitate day-to-day engagement between public institutions, private sector actors, and community stakeholders. This arrangement ensures strong country ownership while maintaining alignment with national adaptation priorities and institutional frameworks. The General Coordinator will lead coordination with national and subnational government institutions for policy-related actions; ensure close collaboration with CAINCO for private-sector-led activities; oversee capacity-building and training activities in coordination with local institutions and producer organizations; and support the implementation of awareness-raising actions tailored to territorial and cultural contexts.
- 156. Execution Arrangements**
157. UNIDO will be responsible for the overall implementation of Components 1, 2, and 4, including the establishment of the enabling environment, capacity-building and inclusive participation activities, as well as monitoring, evaluation, and knowledge management. In this role, UNIDO will ensure technical oversight, compliance with Adaptation Fund requirements, integration of environmental and social safeguards, and alignment with national adaptation priorities. The Santa Cruz Chamber of Industry, Commerce, Services and Tourism (CAINCO) will act as the Executing Entity for Component 3, focusing on the deployment and financing of climate-resilient cold chain infrastructure through the management of the facility and private sector engagement mechanisms. CAINCO will be responsible for the operational implementation of the competitive financing mechanism, including the disbursement of funds, engagement with beneficiaries, and coordination with private sector actors. This approach ensures accountability, efficiency, and alignment

of financial flows with adaptation outcomes.

158. Project Steering Committee

159. A Project Steering Committee (PSC) will be established to provide strategic oversight and guidance throughout implementation. The PSC will be chaired by the VMA and will include representatives from UNIDO and CAINCO. The PSC will meet on a regular basis (at least twice per year) and will be responsible for:

- I. Providing strategic guidance and advisory support to the project;
- II. Reviewing and approving annual workplans;
- III. Monitoring overall project progress and alignment with national priorities;
- IV. Addressing key project implementation issues and facilitating coordination among stakeholders.

160. Technical and Operational Oversight

161. UNIDO will ensure: (i) Overall technical supervision and quality assurance; (ii) Compliance with the Adaptation Fund's Environmental and Social Policy, Gender Policy, and fiduciary standards; (iii) Monitoring, evaluation, and reporting in line with AF requirements; and (IV) Integration of environmental and social safeguards and climate adaptation principles throughout project implementation. In addition, the project will engage local partners, technical institutions, and service providers to support the delivery of activities at the territorial level, ensuring that interventions are context-specific, inclusive, and responsive to local needs.

A. Demonstrate how the project/programme aligns with the Results Framework of the Adaptation Fund

Project Outcome(s)	Project Indicator(s)	Fund Outcome	Fund Outcome Indicator	Grant Amount (USD)
Outcome 1: Enabling policy, institutional, and market environment is established to support climate-resilient cold chains and food loss reduction	Number of institutions (public and private) applying climate-resilient cold chain standards and guidelines Number of policies, strategies, or regulatory instruments integrating climate resilience in food systems and cold chains	OUTCOME 2 Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses	Indicator 2: Institutions with strengthened capacity to understand and better address climate risks and resilience	400,000
		OUTCOME 7 Improved policies and regulations that promote and enforce resilience measures	Indicator 7: Policies, strategies, and/or plans adopted, implemented, and/or enforced that integrate climate risk and resilience considerations [#, disaggregated by scale, by policy step, and by sector]	400,000
Outcome 2: Vulnerable producers, SMEs, and communities—particularly women, Indigenous	Number of beneficiaries (disaggregated by gender, Indigenous Peoples) trained in climate-resilient cold chain practices Percentage of trained beneficiaries	OUTCOME 3 Strengthened awareness and ownership of adaptation and climate risk reduction	Indicator 3A: People with strengthened awareness of climate change risks and how to	900,000

Peoples, and smallholders—have strengthened capacities to adopt, operate, and sustain climate-resilient cold chain systems and practices.	applying improved cold chain and post-harvest management practices	processes	better address them	
Outcome 3: Deployment and sustainable operation of climate-resilient cold chain systems reduce climate-related losses in agri-food systems	Number of climate-resilient cold chain infrastructure systems installed and operational (e.g., storage, aggregation points) Percentage reduction in post-harvest losses in targeted value chains attributable to project interventions	OUTCOME 4: Increased adaptive capacity within relevant development sector services and infrastructure assets	Indicator 4: Physical assets improved or constructed to withstand climate variability and change	6,000,000
Outcome 4: Evidence, learning and stakeholder awareness support the replication and scaling of climate-resilient cooling solutions.	Number of technical guidelines developed (target: ≥3) Number of platforms established (target: ≥2) Number of coordination meetings held per year (target: ≥4 per platform) Number of stakeholders using project-generated knowledge products (guidelines, tools, platforms)	OUTCOME 3: Strengthened awareness and ownership of adaptation and climate risk reduction processes	Indicator 3A: People with strengthened awareness of climate change risks and how to better address them	847,955

Project Outputs(s)	Project Output Indicator(s)	Fund Output	Fund Output Indicator	Grant Amount (USD)
Output 1.1: Climate-informed cold chain systems planning and prioritization completed	Number of intervention models defined (target: ≥3) Number of operational food recovery and redistribution systems established (target: ≥3 pilot systems). Percentage of systems applying standardized handling, storage, and redistribution protocols (target: 100%). Dissemination products developed and circulated (e.g., technical guidelines, maps) (e.g., technical guidelines, route maps) (target: ≥3).	Output 2.1: Strengthened capacity of institutions to understand and better address climate risks	Indicator 2.1: Institutions supported to strengthen capacity to understand and address climate risks and resilience	400,000
Output 1.2: Policy, regulatory, and institutional framework for resilient cold chains systems strengthened	Number of policy recommendations developed (target: ≥3) Number of regulatory roadmaps developed (target: ≥2) Number of planning instruments aligned with NDCs (target: ≥3) Percentage of interventions explicitly contributing to NDC/NAP targets (target: 100%)	Output 7.1: Improved integration of climate-resilience strategies into country development plans	Indicator 7.1A: Policies, strategies, and/or plans developed or adjusted to integrate climate risk and resilience considerations	400,000

	- Number of standards and certifications identified and prioritized (target: ≥6) - Number of technical guidelines or documents developed (target: ≥6) - Number of stakeholders trained on standards (target: ≥100) - Percentage of private sector actors adopting guidelines (target: ≥50% in pilot phase) - Number of companies receiving technical assistance (target: ≥20) - Number of platforms established (target: ≥2)			
Output 2.1: Adaptive, operational, and management capacities for cold chain and post-harvest handling strengthened and adopted	• ≥10 workshops conducted in prioritized territories; • ≥200 producers and aggregation center staff trained; • ≥40% women's participation; • 200 operators trained; • ≥30% participation from vulnerable groups. • ≥150 technicians from local communities trained • ≥80% with verified competencies • ≥30% women's participation in training processes • ≥70% of systems maintain records of maintenance and refrigerant management;	Output 3.1: Targeted population groups participating in adaptation and risk reduction awareness activities	Indicator 3.1: People participating in activities to improve awareness of climate risks and how to address them	350,000
Output 2.2: Access to finance, and investment readiness of local actors enhanced	▪ ≥300 actors trained (at least 40% women); • ≥5 formal agreements or linkages established between local actors and financial institutions; • ≥3 financial institutions actively engaged. • ≥3 financial models designed and disseminated; • ≥2 models implemented in pilot phase; • ≥3 public-private partnerships established; • ≥3 incentive mechanisms designed and implemented;	Output 3.1: Targeted population groups participating in adaptation and risk reduction awareness activities	Indicator 3.1: People participating in activities to improve awareness of climate risks and how to address them	400,000
Output 2.3: Organizational and business capacities of local actors strengthened	▪ ≥10 organizations with formalized and operational governance structures; ▪ ≥40% participation of women in organizational structures. • ≥8 business models implemented and operational; • ≥80% of cold chain systems applying tariff schemes;	Output 3.1: Targeted population groups participating in adaptation and risk reduction awareness activities	Indicator 3.1: People participating in activities to improve awareness of climate risks and how to address them	150,000

	• ≥70% operational cost recovery (O&M) in supported infrastructure; • ≥50% of models incorporate incentives for climate-resilient practices. • ≥150 actors trained (producers, operators, cooperatives), with ≥40% women; • % of participants apply financial management and planning tools;			
Output 3.1: Technical and Financing Facility operational, enabling deployment of resilient cold chain across priority value chains and vulnerable regions.	• Technical and financing facility established and operational • Total funds committed and disbursed (target: ≥USD 5 million; ≥80% disbursed) • Number of calls for proposals launched (target: 3-6) • Number of SMEs/local actors technically and financially supported through the Facility (target: ≥30) • Number of aggregation centers equipped/upgraded with pre-cooling and cold storage systems (target: ≥12) • Number of cooling systems installed and operational in the fisheries sector (target: ≥10) • Number of cooling systems installed and operational in the dairy sector (target: ≥10) • Number of beneficiary producers/users by sector (target: ≥300 total; disaggregated by fisheries and dairy) • Number of food banks/community systems equipped with cold storage infrastructure (target: ≥10)	Output 4.1: <i>Vulnerable development sector services and infrastructure assets strengthened in response to climate change impacts, including variability</i>	Indicator 4.1: Development sector services strengthened to respond to climate variability and change	5,000,000
Output 3.2: Sustainable financing mechanisms for climate-resilient cold chain investments are established and operationalized	• Number of financing mechanisms developed or adapted for climate-resilient cold chain investments (target: ≥2) • Number of partnership agreements signed with financial institutions (target: ≥2) • Total value of loans mobilized for climate-resilient cold chain investments (target: ≥USD 1 million) • Number of financial institutions integrating cold-chain investments into their lending portfolio (target: ≥2)	Output 4.1: <i>Vulnerable development sector services and infrastructure assets strengthened in response to climate change impacts, including variability</i>	Indicator 4.1: Development sector services strengthened to respond to climate variability and change	1,000,000
Output 4.1: Community awareness,	• ≥ 60% of trained producers/communities apply at least 3 improved practices	Output 3.2: <i>Strengthened capacity of national</i>	Indicator 3.2: Climate resilience knowledge	347,955

adoption of climate-resilient post-harvest practices, and knowledge-sharing networks strengthened	• ≥ 40% participation of women in the adoption of practices. • ≥ 10 local knowledge networks established or strengthened • ≥ 50 community promoters trained • At least 30% of promoters are women or belong to Indigenous Peoples. • ≥ 10 technical and awareness materials developed (including accessible, multilingual, and culturally appropriate formats) • Platform operational with periodic updates (≥ 2 per year). • ≥ 5 campaigns implemented at local and national levels	and subnational stakeholders and entities to capture and disseminate knowledge and learning	products and/or tools developed and shared with stakeholders	
Output 4.2: Monitoring, evaluation, learning, and knowledge management systems operational and supporting adaptive management and replication.	• Number of knowledge products developed (target: ≥5).. • Number of knowledge-sharing events conducted (target: ≥5).	Output 3.2: Strengthened capacity of national and subnational stakeholders and entities to capture and disseminate knowledge and learning	Indicator 3.2: Climate resilience knowledge products and/or tools developed and shared with stakeholders	500,000

¹ The AF utilized OECD/DAC terminology for its results framework. Project proponents may use different terminology but the overall principle should still apply

PART IV: ENDORSEMENT BY GOVERNMENT AND CERTIFICATION BY THE IMPLEMENTING ENTITY

A. Record of endorsement on behalf of the government²

Provide the name and position of the government official and indicate date of endorsement. If this is a regional project/programme, list the endorsing officials all the participating countries. The endorsement letter(s) should be attached as an annex to the project/programme proposal. Please attach the endorsement letter(s) with this template; add as many participating governments if a regional project/programme:

José Fernando Romero Pinto Minister of Development Planning and the Environment	Date: (July, 06, 2026)
---	------------------------

B. Implementing Entity certification

Provide the name and signature of the Implementing Entity Coordinator and the date of signature. Provide also the project/programme contact person's name, telephone number and email address

I certify that this proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans (.....list here.....) and subject to the approval by the Adaptation Fund Board, commit to implementing the project/programme in compliance with the Environmental and Social Policy and the Gender Policy of the Adaptation Fund and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.

 Ms. Ganna Onysko Senior GEF, GCF, AF Coordinator Division of Funding Partner Relations Directorate of Global Partnerships and External Relations United Nations Industrial Development Organization - UNIDO Implementing Entity Coordinator	
Date: September 8, 2026	Tel. and email: G.ONYSKO@unido.org
Project Contact Person: Valeria Arroyave Cardozo, Industrial Development Officer, United Nations Industrial Development Organization - UNIDO	
Tel. And Email: V.ARROYAVECARDOZO@unido.org ; g.onysko@unido.org	
CC: gef@unido.org / glo@unido.org / f.haidara@unido.org	

⁶ Each Party shall designate and communicate to the secretariat the authority that will endorse on behalf of the national government the projects and programmes proposed by the implementing entities.



MINISTERIO
DE PLANIFICACIÓN DEL
DESARROLLO Y MEDIO AMBIENTE

La Paz, - 6 JUL. 2026

MPDyMA/VMABCCGDF/CGO-NE 00108/2026

0916

To: The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat
Email: Secretariat@Adaptation-Fund.org
Fax: 202 522 3240/5

Subject: Endorsement for "Strengthening Climate Adaptation through Sustainable Cooling Solutions for Vulnerable Communities in Bolivia (ADAPT COOL Bolivia)"

Dear Members of the Adaptation Fund Board,

In my capacity as designated authority for the Adaptation Fund in the Plurinational State of Bolivia, I confirm that the above national project proposal is in accordance with the government's national priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in Bolivia.

Accordingly, I am pleased to endorse the above project proposal with support from the Adaptation Fund. If approved, the project/programme will be implemented by the United Nations Industrial Development Organization (UNIDO) and executed by the Santa Cruz Chamber of Industry, Commerce, Services and Tourism (CAINCO).

Sincerely,



MPDyMA-I-06545/2026
JFRP/DELH/JEAA/Vladimir Viza
C.c.

1721
José Fernando Romero Pinto
MINISTRO DE PLANIFICACIÓN DEL DESARROLLO
Y MEDIO AMBIENTE



Project Formulation Grant (PFG)

Submission Date: 08/09/2026

Adaptation Fund Project ID:

Country/ies: Plurinational State of Bolivia

Title of Project/Programme: Strengthening climate adaptation through sustainable cooling solutions for vulnerable communities in the Plurinational State of Bolivia (ADAPT COOL Bolivia)

Type of IE (NIE/MIE): Multilateral Implementing Entity

Implementing Entity: United Nations Industrial Development Organization (UNIDO)

Executing Entity/ies: UNIDO

A. Project Preparation Timeframe

Start date of PFG	November 2026
Completion date of PFG	September 2027

B. Proposed Project Preparation Activities (\$)

Describe the PFG activities and justifications:

Proposed Project Preparation Activities	Output of the PFG Activities	USD Amount
1. Conduct national cold chain market and systems assessment, including climate risk analysis and value chain diagnostics	• Integrated national assessment report covering climate risks, cold chain gaps, and market dynamics (Component 1) • Identification of prioritised value chains, geographic areas, and target populations • Technology identification and prioritization and feasibility framework • Economic and financial analysis (cost–benefit, business models) • Evidence base for USP/grant facility design (Component 3) • Final report translated into Spanish	60,000
2. Design the small grants facility (USP) and develop financing and operational mechanisms	• Fully defined USP financing mechanism aligned with AF requirements (Component 3) • Draft operational manual (eligibility, fiduciary procedures, disbursement modalities) • Selection and evaluation framework incorporating climate, gender, and ESS criteria • Preliminary pipeline of eligible subprojects types	5,000
3. Conduct gender, environmental and social assessments and develop safeguard instruments (ESMP & GAP)	• Gender Assessment • Gender Action Plan (GAP) with targets and indicators (Component 2, cross-cutting) • Environmental and Social Management Plan (ESMP) establishing a framework for screening	28,000

	and managing subprojects (USPs) • Indigenous Peoples assessment and FPIC-based consultations • Compliance framework with Adaptation Fund ESS requirements	
4. Develop results framework and monitoring, evaluation and learning (MEL) system	• AF-compliant results framework aligned with project components • Monitoring, evaluation and reporting plan (Component 4)	5,249
5. Develop knowledge management and scaling strategy	• Knowledge management strategy to capture lessons learned (Component 4) • Scaling and replication strategy, including policy uptake pathways	3,000
6. Conduct stakeholder consultations, institutional assessments and define implementation arrangements	• Stakeholder consultation reports (including Indigenous Peoples and vulnerable groups) • Assessment of executing entities' technical, fiduciary and ESS capacity • Final implementation and governance arrangements (Components 1 & 4)	15,000
7. Prepare and finalise the Adaptation Fund full proposal	• Complete AF Full Proposal, including technical annexes (ESMP, GAP, feasibility studies, etc.), ready for submission	15,000
8. Undertake expert missions and field visits	• Technical inputs, validation, and field-based evidence supporting all PFG outputs	7,000
Total Project Formulation Grant		138,249
<i>Implementing Entity management fee (Agency fee 8.5%)</i>	• IE admin and technical support for project development, monitoring and supervision. • Compliance assurance.	11,751
Total Project Formulation Grant		150,000

The PFG activities are designed to generate the technical, institutional, and safeguard foundations required for the development of a full proposal, including the establishment of an ESMP framework for unidentified sub-projects.

C. Implementing Entity

This request has been prepared in accordance with the Adaptation Fund Board's procedures and meets the Adaptation Fund's criteria for project identification and formulation

Implementing Entity Coordinator, IE Name	Signature	Date (Month, day, year)	Project Contact Person	Telephone	Email Address
Ms. Ganna Onysko Senior GEF, GCF, AF		8 Sep 2026	Valeria Arroyave Cardozo, Industrial		G.ONYSKO@unido.org ; V.ARROYAVECARDOZO@unido.org

Coordinator Division of Funding Partner Relations Directorate of Global Partnerships and External Relations, United Nations Industrial Development Organization - UNIDO			Development Officer, United Nations Industrial Development Organization - UNIDO		
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Annex I - Preliminary consultations undertaken during concept development from April - May 2026

1. Records of technical exchange and consultation between UNIDO and the Vice Ministry of Environment, Biodiversity, Climate Change and Forest Management and Development, including the Governmental Ozone Commission on 02 April 2026

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CONCLUSIÓN DE LA REUNIÓN

Durante la reunión se presentó de manera preliminar la iniciativa "Strengthening Climate Adaptation through Sustainable Cooling Solutions for Vulnerable Communities in Bolivia – ADAPT-COOL Bolivia", orientada a fortalecer la resiliencia climática de los sistemas agroalimentarios mediante el desarrollo y fortalecimiento de soluciones sostenibles y resilientes de cadena de frío.

Se analizó que el incremento de las temperaturas, la variabilidad climática y la mayor frecuencia de eventos extremos vienen incrementando la vulnerabilidad de los sistemas agroalimentarios, afectando no solamente la producción, sino también las etapas de conservación, almacenamiento, transporte y distribución de productos perecederos. En este contexto, se identificó la necesidad de fortalecer los sistemas de cadena de frío como una medida de adaptación que contribuya a reducir pérdidas poscosecha, mejorar la conservación y disponibilidad de alimentos y fortalecer la capacidad adaptativa de los actores vinculados a las cadenas agroalimentarias.

La Comisión Gubernamental del Ozono destacó la importancia de que las soluciones de enfriamiento que se consideren en el proyecto incorporen criterios de eficiencia energética, sostenibilidad ambiental y refrigeración sostenible, aprovechando la experiencia técnica desarrollada en Bolivia en el marco del Protocolo de Montreal y los procesos nacionales de transición hacia tecnologías de menor impacto climático.

Asimismo, se señaló la importancia de que la propuesta mantenga una clara vinculación con las prioridades nacionales de adaptación al cambio climático y con los instrumentos nacionales relacionados con el fortalecimiento de la resiliencia de los sistemas productivos y la reducción de pérdidas de productos perecederos.

Durante el intercambio se recomendó abordar la cadena de frío desde una perspectiva integral, considerando las distintas etapas de la cadena agroalimentaria, incluyendo producción, acopio, preenfriamiento, almacenamiento, transporte y distribución. También se consideró importante que las

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COMITÉ INTERMINISTERIAL DEL
OZONO

soluciones a ser desarrolladas posteriormente respondan a las diferentes condiciones climáticas, territoriales y productivas existentes en el país.

Como resultado de la reunión, los criterios planteados fueron considerados como insumos para la estructuración inicial del proyecto, reforzándose particularmente los siguientes elementos:

- la consideración de la cadena de frío resiliente como una medida concreta de adaptación al cambio climático;
- la vinculación de las intervenciones con la reducción de pérdidas poscosecha y el fortalecimiento de la resiliencia de los sistemas agroalimentarios;
- la incorporación transversal de criterios de eficiencia energética y sostenibilidad ambiental;
- la consideración de tecnologías de refrigeración de bajo impacto climático;
- la necesidad de adoptar un enfoque territorial que permita posteriormente definir soluciones apropiadas para las distintas condiciones productivas y climáticas del país; y
- la necesidad de mantener mecanismos de coordinación entre las instituciones públicas competentes, ONUDI y los demás actores que participen en las siguientes etapas de formulación.

Se acordó continuar con el desarrollo conceptual de la propuesta y profundizar, en posteriores reuniones técnicas, el análisis de los componentes, tecnologías, necesidades de fortalecimiento de capacidades, mecanismos de implementación y criterios para la priorización de las futuras intervenciones.

Asimismo, se reconoció que esta reunión constituye parte de una etapa preliminar de consulta y coordinación institucional, por lo que los aspectos identificados deberán ser complementados durante la preparación de la propuesta completa mediante un proceso de consulta más amplio y estructurado con los actores y potenciales beneficiarios del proyecto.



María Teresa Rodríguez
Ministra de Planificación del Desarrollo y Medio Ambiente



Carlos Rodríguez
Ministro de Planificación del Desarrollo y Medio Ambiente



Juan Carlos Rodríguez
Ministro de Planificación del Desarrollo y Medio Ambiente



María Teresa Rodríguez
Ministra de Planificación del Desarrollo y Medio Ambiente

Comité Interministerial del Ozono

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Oficina Comisionar Gubernamental del Ozono – La Paz Bolivia																																	
FECHA INICIO: 9:30 AM																																	
Presentar de manera preliminar la iniciativa "Strengthening Climate Adaptation through Sustainable Cooling Solutions for Vulnerable Communities in Bolivia – ADAPT-COOL Bolivia" y recoger criterios técnicos e institucionales de la Comisión Gubernamental del Ozono para la identificación de prioridades, oportunidades de coordinación y elementos relevantes para la estructuración conceptual del proyecto.																																	
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2. Records of technical exchange and consultation between UNIDO and the Vice Ministry of Environment, Biodiversity, Climate Change and Forest Management and Development, including the Governmental Ozone Commission, on 23 April 2026



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ACTA DE REUNIÓN

TEMA: Presentación inicial e identificación de prioridades para la formulación del proyecto ADAPT-COOL Bolivia	D	M	A
LUGAR: Oficina ONUDI - La Paz Bolivia	23	abril	2026
HORA DE INICIO: 14:30 AM			

OBJETIVO: Revisar técnicamente la estructura preliminar del proyecto ADAPT-COOL Bolivia y recoger criterios de la Comisión Gubernamental del Ozono respecto a la factibilidad de las intervenciones propuestas, las tecnologías de refrigeración sostenible, la eficiencia energética, el fortalecimiento de capacidades y las condiciones necesarias para garantizar la sostenibilidad de las soluciones de cadena de frío.

N°	NOMBRES	DEPENDENCIA	CELULAR	CORREO	FIRMA
1	Vladimir Alex. Viter Caceres	Comisión Gub. Ozono	69514282	v.viter@comisiongub.bo	
2	Jorge Gonzalez Romeros	ONU	76772329	jgonzalez@onu-bo	
3	Victor A. Bustamante Cervellio	Comisión Gub. Ozono	6072822	v.bustamante@comisiongub.bo	
4	Marcelo P. Torres Cruz	CGO	7544611	m.torres@comisiongub.bo	
5	Fabrizio Montecorre Padilla	CGO	7171602	f.montecorre@comisiongub.bo	

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CONCLUSIÓN DE LA REUNIÓN

En seguimiento a la presentación preliminar y a los primeros intercambios desarrollados para la formulación de "Strengthening Climate Adaptation through Sustainable Cooling Solutions for Vulnerable Communities in Bolivia - ADAPT-COOL Bolivia", se realizó una revisión técnica de las principales líneas de intervención consideradas para el proyecto.

Durante la reunión se analizó que las brechas existentes en los sistemas de cadena de frío en Bolivia no se limitan únicamente a la falta de infraestructura, sino que también están relacionadas con capacidades técnicas insuficientes, limitaciones para la adecuada operación y mantenimiento de los sistemas, acceso restringido a tecnologías apropiadas, baja eficiencia energética y dificultades de acceso a mecanismos de financiamiento.

En este sentido, la Comisión Gubernamental del Ozono recomendó que el proyecto adopte un enfoque integral, de manera que las inversiones en infraestructura de cadena de frío sean acompañadas por acciones de fortalecimiento de capacidades técnicas, operativas, organizacionales y de gestión que permitan garantizar su funcionamiento y sostenibilidad en el tiempo.

En materia tecnológica, la ONUDI destacó la importancia de priorizar soluciones energéticamente eficientes y de bajo impacto climático, promoviendo, cuando resulte técnica y económicamente viable, tecnologías que utilicen refrigerantes de bajo potencial de calentamiento global y refrigerantes naturales, en coherencia con las políticas y procesos de transición tecnológica impulsados en Bolivia en el marco del Protocolo de Montreal y la Enmienda de Kigali.

Asimismo, se señaló que la selección de las tecnologías deberá considerar criterios de seguridad, eficiencia energética, condiciones climáticas y productivas de cada territorio, disponibilidad de capacidades técnicas locales y viabilidad para su operación y mantenimiento.

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Se analizaron preliminarmente diferentes etapas de la cadena de frío susceptibles de fortalecimiento, incluyendo sistemas de preenfriamiento, centros de acopio, almacenamiento refrigerado, transporte bajo condiciones controladas y sistemas de conservación y distribución de productos perecederos.

También se consideró la importancia de trabajar con soluciones diferenciadas en función de las características territoriales del país, reconociendo que las necesidades y condiciones de implementación pueden variar entre el Altiplano, los Valles y las regiones del Oriente y Amazonia.

Se destacó especialmente la necesidad de fortalecer las capacidades de técnicos y operadores responsables de la instalación, operación, diagnóstico y mantenimiento de equipos de refrigeración, considerando que la sostenibilidad de la infraestructura dependerá también de la existencia de capacidades locales suficientes.

Como resultado del intercambio, se consideró pertinente fortalecer dentro de la estructuración del proyecto los siguientes elementos:

- incorporación de acciones específicas de fortalecimiento de capacidades técnicas, operativas y de gestión asociadas a las inversiones en infraestructura;
- consideración de criterios de eficiencia energética y sostenibilidad ambiental para la selección de tecnologías;
- incorporación de tecnologías con refrigerantes de bajo GWP y, cuando resulte técnicamente aplicable, refrigerantes naturales;
- análisis previo de la viabilidad técnica, económica, ambiental y climática de las soluciones;
- fortalecimiento de capacidades locales para instalación, operación y mantenimiento;
- consideración de las distintas etapas de la cadena de frío, desde el acopio y preenfriamiento hasta el almacenamiento, transporte y distribución;
- incorporación de mecanismos que faciliten el acceso a financiamiento e innovación para la adopción de soluciones de cadena de frío; y
- articulación entre infraestructura, capacidades, financiamiento y sostenibilidad tecnológica como elementos complementarios de una misma estrategia de adaptación.

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PRESIDENTE Y VICEPRESIDENTE
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Dr. Jorge Gonzalez Romeros
COORDINADOR GENERAL
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3. Records of technical exchange and consultation between UNIDO and the Vice Ministry of Environment, Biodiversity, Climate Change and Forest Management and Development, including the Governmental Ozone Commission, and with the Chamber of Industry, Commerce, Services and Tourism of Santa Cruz (CAINCO), on 05 May 2026

MINISTERIO DE PLANIFICACIÓN DEL DESARROLLO Y MEDIO AMBIENTE

COMISIÓN GUBERNAMENTAL DEL OZONO

ACTA DE REUNIÓN

TEMA: Coordinación institucional, articulación público-privada y consideraciones sociales y de género para la estructuración del proyecto ADAPT-COOL Bolivia

LUGAR: Oficina Comisión Gubernamental del Ozono – La Paz Bolivia

HORA DE INICIO: 10:00 AM

	D	M	A
	05	mayo	2026

OBJETIVO: Revisar los avances en la estructuración institucional del proyecto ADAPT-COOL Bolivia, incluyendo las acciones de coordinación desarrolladas con actores del sector privado, y analizar las consideraciones sociales, de género e inclusión que deberán ser profundizadas durante la preparación de la propuesta completa.

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CONCLUSIÓN DE LA REUNIÓN

Se revisaron los avances alcanzados en la estructuración conceptual e institucional de la propuesta, así como los mecanismos de coordinación necesarios para articular las capacidades del sector público, ONUDI, el sector privado y los futuros actores territoriales y productivos vinculados con las cadenas agroalimentarias.

ONUDI informó a la Comisión Gubernamental del Ozono sobre las reuniones e intercambios sostenidos con la Cámara de Industria, Comercio, Servicios y Turismo de Santa Cruz – CAINCO, orientados a analizar oportunidades de participación del sector privado, mecanismos de articulación con actores de las cadenas de valor y alternativas para facilitar la implementación y sostenibilidad de las futuras inversiones en infraestructura de cadena de frío.

Se informó que durante estos intercambios con CAINCO se había analizado la importancia de aprovechar su capacidad de articulación con empresas, proveedores de tecnología, actores agroindustriales, operadores logísticos, instituciones financieras y organizaciones sociales, originarios y campesinas, con el propósito de facilitar la participación del sector privado dentro del proyecto y contribuir a la sostenibilidad y posterior escalamiento de las soluciones implementadas.

Asimismo, ONUDI informó que en las conversaciones con CAINCO se habían considerado, entre otros, los siguientes elementos:

- la necesidad de articular las soluciones de cadena de frío con las cadenas de valor agroalimentarias y sus actores, enfatizando población vulnerable;
- la participación del sector privado en la identificación, desarrollo e implementación de soluciones técnicamente y económicamente viables;
- el establecimiento de mecanismos de colaboración y alianzas público-privadas;
- la necesidad de facilitar el acceso de productores, organizaciones y MIPYMES a mecanismos de financiamiento para la adopción o mejora de tecnologías de cadena de frío;

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- la posibilidad de desarrollar mecanismos de cofinanciamiento e instrumentos que contribuyan a movilizar recursos adicionales;
- la necesidad de vincular proveedores de tecnología, empresas, instituciones financieras y potenciales beneficiarios;
- la importancia de promover modelos de implementación que permitan sostenibilidad económica, operación adecuada y posibilidades de réplica; y
- el potencial de CAINCO para facilitar la participación del sector privado y apoyar la ejecución de las intervenciones relacionadas con infraestructura y financiamiento.

Tomando en consideración estos avances, se discutió una estructura de gobernanza en la cual el Viceministerio de Medio Ambiente, Biodiversidad, Cambio Climático y de Gestión y Desarrollo Forestal, a través de la Comisión Gubernamental del Ozono, contribuya a la orientación estratégica del proyecto, a su alineación con las prioridades nacionales de adaptación al cambio climático y refrigeración sostenible y a la articulación interinstitucional.

Por su parte, ONUDI asumirá la supervisión técnica y metodológica general y el cumplimiento de los requerimientos del Fondo de Adaptación, mientras que CAINCO podría desempeñar un rol relevante en la articulación del sector privado y en la implementación de las actividades relacionadas con el desarrollo, financiamiento y despliegue de soluciones de cadena de frío resiliente.

La CGO consideró pertinente el esquema de articulación planteado y destacó la importancia de mantener mecanismos claros de coordinación entre los actores participantes, procurando que las soluciones desarrolladas respondan tanto a las prioridades nacionales de adaptación como a las necesidades reales de los territorios y cadenas productivas.

Durante la reunión se analizó asimismo que la población potencialmente beneficiaria del proyecto presenta distintos niveles de vulnerabilidad climática y socioeconómica. Se destacó particularmente la necesidad de considerar a pequeños productores, organizaciones y cooperativas, comunidades rurales e indígenas, mujeres productoras y otros actores con acceso limitado a infraestructura, tecnología, capacitación y financiamiento.

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Se señaló que las mujeres desempeñan un papel relevante en diferentes etapas de las cadenas agroalimentarias, incluyendo producción, manejo poscosecha, conservación y comercialización de alimentos. En este sentido, se recomendó que la siguiente fase de formulación permita identificar de manera específica las barreras que enfrentan para acceder a infraestructura, tecnologías, financiamiento, capacitación y espacios de toma de decisiones.

En consecuencia, se consideró necesario desarrollar durante una eventual preparación de la propuesta completa un proceso de consulta más amplia, profundo y estructurado que incorpore a los actores vulnerables.

Como resultado de la reunión y de las acciones de coordinación reportadas, se consideraron como elementos relevantes para la estructuración del proyecto:

- consolidar un mecanismo de coordinación entre Gobierno, ONUDI y sector privado;
- mantener al Viceministerio, a través de la CGO, como referente de orientación estratégica y articulación institucional;
- fortalecer la participación del sector privado mediante la articulación con CAINCO;
- incorporar mecanismos de financiamiento, innovación y alianzas público-privadas dentro del componente de infraestructura;
- reforzar el enfoque territorial, inclusivo y sensible al género y a los territorios indígenas originarios campesinos;
- considerar de manera específica las necesidades de mujeres, comunidades rurales e indígenas y otros grupos vulnerables;

Finalmente, se acordó continuar la coordinación entre ONUDI y la CGO durante la preparación y presentación de la propuesta, así como mantener informada a la instancia nacional sobre los avances de articulación con CAINCO y otros actores relevantes.

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Annex II - Preliminary Gender Assessment (GA)

Strengthening Climate Adaptation through Sustainable Cooling Solutions (ADAPT COOL Bolivia)

I. Introduction

This preliminary Gender Assessment (GA) has been prepared in accordance with the Adaptation Fund Gender Policy. It assesses gender dynamics relevant to climate vulnerability, rural livelihoods, and cold chain systems in Bolivia, focusing on differences in access to resources, economic opportunities, technologies, and decision-making processes. It identifies key gender-related barriers and opportunities that will inform the project's gender-responsive design.

The assessment provides an initial analytical foundation and will be further strengthened during the Project Formulation Grant (PFG) phase through value chain analysis, stakeholder consultations, and primary data collection, culminating in the preparation of a Gender Action Plan.

II. Gender Equality Context in Bolivia

Bolivia has made important progress in gender equality through a relatively strong legal framework and high levels of women's political representation. However, significant inequalities persist, particularly among rural and Indigenous women.

Women participate actively in the labour market, with a labour-force participation rate of 72.9%, compared with 84.4% for men (World Bank, 2025). However, approximately 83% of employed women work in the informal economy, compared with 80% of men (UN Women, 2023), limiting access to stable income, social protection, finance, and productive investments.

Women play an important role in Bolivia's agri-food systems, particularly in small-scale production, post-harvest handling, processing, and local food distribution. Despite their contributions, they continue to face barriers to accessing land, infrastructure, technologies, financial services, and markets. These challenges are compounded by limited participation in decision-making processes and a disproportionate burden of unpaid care work.

According to 2024 Population Census, 38.7% of Bolivia's population self-identifies as Indigenous, native, peasant, or Afro-Bolivian. Indigenous women experience additional constraints linked to poverty, remoteness, and reduced access to services and economic opportunities.

III. Gender, Climate Change and Agricultural Systems

Climate change is increasing pressure on Bolivia's agri-food systems through rising temperatures, changing rainfall patterns, and more frequent extreme weather events. Existing gender inequalities influence how climate risks are experienced and managed.

Women are particularly exposed because they are heavily involved in climate-sensitive agricultural activities and post-harvest management. Climate-related losses of perishable products directly affect their incomes, livelihoods, and household food security. Limited access to refrigeration, cold storage, and temperature-controlled transport further restricts their ability to reduce losses and respond effectively to climate-related shocks.

Women's adaptive capacity is also constrained by lower access to finance, climate-resilient technologies, technical training, and market opportunities. These barriers reduce their ability to invest in adaptation measures and participate in higher-value segments of agri-food value chains.

IV. Relevance to the Proposed Project

Structural bottlenecks in Bolivia's agri-food systems, particularly in market access, infrastructure, and logistics, disproportionately affect women producers (World Bank, 2019). Deficiencies in refrigeration, storage, and transport contribute to post-harvest losses and reduced product value, directly affecting women's incomes and food provisioning roles. The project will address these constraints by improving access to climate-resilient cold chain solutions, reducing losses, strengthening market access and income stability, and enhancing food security. Through targeted financing, capacity-building, and inclusive governance mechanisms, the project will promote women's equitable access to resources, technologies, and decision-making processes, thereby strengthening their adaptive capacity and resilience to climate change.

V. Gender Risks and Mitigation Measures

Without targeted measures, women may face lower access to financing, technologies, training opportunities, and productive assets supported by the project.

To address these risks, the project will apply inclusive beneficiary selection criteria that prioritize women-led enterprises and vulnerable groups, conduct targeted outreach through women's and Indigenous organizations, promote women's participation in decision-making processes, and implement gender-sensitive monitoring using sex-disaggregated indicators.

VI. Opportunities for Women's Empowerment

The project offers significant opportunities to advance gender equality while strengthening climate resilience. Improved cold chain infrastructure will reduce post-harvest losses, enhance product quality, and facilitate women's access to higher-value markets, thereby increasing income stability. Addressing gender gaps in access to productive resources can also generate broader economic benefits, as closing these gaps has been shown to increase agricultural output in developing countries. In addition, targeted capacity-building will enhance women's technical and entrepreneurial skills, supporting their participation in higher-value segments of the cold chain. Improved food preservation and distribution will further strengthen food security and nutrition. Overall, gender-responsive cold chain interventions generate important co-benefits for climate adaptation, economic development, and social inclusion.

VII. Gender-Responsive Approach in Project Design

Gender considerations will be systematically integrated across project design and implementation, drawing on international good practices in gender-responsive cold chain and cooling initiatives. The project will ensure inclusive participation by establishing minimum thresholds (e.g. at least 40% women beneficiaries) and implementing proactive outreach strategies targeting women, including Indigenous women and women-led enterprises.

To address structural barriers, the project will prioritise women-led enterprises, cooperatives, and actors engaged in post-harvest handling and local distribution through dedicated financing windows. Financial mechanisms will be tailored to women's needs, addressing constraints such as limited collateral, lower financial literacy, and restricted access to formal credit, and will be complemented by technical assistance to facilitate uptake. Capacity-building programmes will be designed to be accessible, context-specific, and culturally appropriate, including flexible delivery formats and practical training on cold chain operation and maintenance. At the same time, the project will promote women's participation in governance and decision-making structures related to cold chain infrastructure and services, strengthening their agency and influence over investments and operations.

Gender-responsive indicators will be integrated into the results framework, including measures related to women's access to financing, participation in training, involvement in decision-making, and changes in income and post-harvest losses, supported by a monitoring and evaluation system that collects sex-disaggregated and intersectional data and tracks differential outcomes. Finally, project design will explicitly consider potential impacts on women's time use and workload, ensuring that interventions promote equitable benefit-sharing and contribute to improving working conditions. Together, these measures will support the effective, inclusive, and sustainable participation of women in climate-resilient cold chain systems.

VIII. Further Development during the PFG Phase

During the PFG phase, this assessment will be expanded through:

- detailed gender mapping across value chains and cold chain systems;
- identification of priority technologies and investment areas from a gender perspective;
- consultation with women producers, Indigenous organisations, and women-led enterprises;
- establishment of baseline data and measurable indicators;
- development of a Gender Action Plan aligned with the Adaptation Fund Gender Policy.

IX. Conclusion

Gender inequality remains a critical determinant of vulnerability to climate change in Bolivia's agri-food systems. Women, particularly those in rural and Indigenous communities, face structural barriers that reduce their adaptive capacity and access to opportunities. By addressing these inequalities through targeted, gender-responsive interventions, the project has strong potential to enhance women's resilience, economic empowerment, and participation in climate adaptation processes, while contributing to more inclusive and sustainable food systems.