

PLAN VIVO PROJECT DESIGN DOCUMENT

BOLITREES: QUECHUA MEDICINAL HERBS AND (AGRO)FORESTRY IN THE CENTRAL BOLIVIAN ANDES

Bolivia

Version 2.0
PV Climate V5
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Doña Frolinda collecting Wira Wira medicinal herbs

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Overview

Project Title:	BOLITREES: QUECHUA MEDICINAL HERBS AND (AGRO)FORESTRY IN THE CENTRAL BOLIVIAN ANDES
Location:	Bolivia, department of Cochabamba, centred around and starting from Tarata.
Version:	2.0
Project Coordinator:	Climate Lab & Misk'i Kausay
Validator:	MUTU International
Validation Date:	21-22 October 2023
Project Intervention(s):	Woodland restoration and agroforestry: silvopastoral woodlands and fruit orchards (full list of specific project interventions is provided in §3.6).
Project Participants:	The project initial aim is to work with two Quechua communities in the inter-Andean valley of Cochabamba, Tarata: Yana Rumi and Tunasani. The project aims for organic growth, by including more and more interested rural communities in the future.
Project Area:	The project initial aim is to establish woodland restoration and agroforestry across ca. 1000 hectares in Tarata. Over time, the project area will be gradually extended to scale-up the project impact.
Project Period:	A crediting period of 35 years is applicable. The project started in 2024 with the first planting and environmental activities, and the crediting period will end in 2059. Thereafter, the project will keep monitoring for another 15 years, bringing the total project period to 50 years.
Methodology:	Methodology PM001: Agriculture and Forestry Carbon Benefit Assessment Methodology
Expected Carbon Benefit:	This is a nature-based carbon removal project. The restoration for silvopastoral forest plots removes 319 tCO ₂ e/ha while the planting of fruit orchards removes 345 tCO ₂ e/ha.
Expected Ecosystem Benefit:	Restoration using native species leads to increased biodiversity and vegetation cover with decreased sheet erosion rates and less land degradation on the steep slopes of the Central Bolivian Andes.
Expected Livelihood Benefit:	Improved smallholder income from agroforestry and sales of non-timber forest products such as natural fruits, apiculture products and leaves (traditional medicines).

1 General Information

1.1 Project Interventions

The Bolitrees project aims to strengthen the agroecological balance in the Quechua communities of the Interandean Bolivian valleys, centred around Cochabamba, by supporting woodland restoration and agroforestry. Particular aims are (i) to stimulate woodland restoration on degraded slopes; (ii) to foster a shift towards agroforestry; (iii) to assist carbon storage in the supported woodlands and agroforestry plots through sustainable management, protection and enrichment planting and (iv) to increase natural ecosystem resources (medicinal and aromatic plants, apiculture and agroforestry products). The project will follow the Plan Vivo model to guarantee the overall sustainability of the project.

Further, project interventions should lead to the following specific project objectives:

- A social shift towards the protection and restoration of woodland areas on the slopes.
- Restoring the natural ecosystem by enrichment planting with native tree species.
- Improved smallholder income from agroforestry and sales of non-timber forest products such as natural fruits, apiculture products and leaves (traditional medicines).
- Improved resilience and productivity of croplands downslope of woodland areas in restoration, through increased blue and green water availability and soil moisture by rainwater.
- Increased biodiversity and vegetation cover with decreased sheet erosion rates and less land degradation.
- Reviving traditional Quechua knowledge in ecosystem balance and NTFPs.
- Sequestration of carbon, mainly through increases in soil carbon and above-ground biomass.

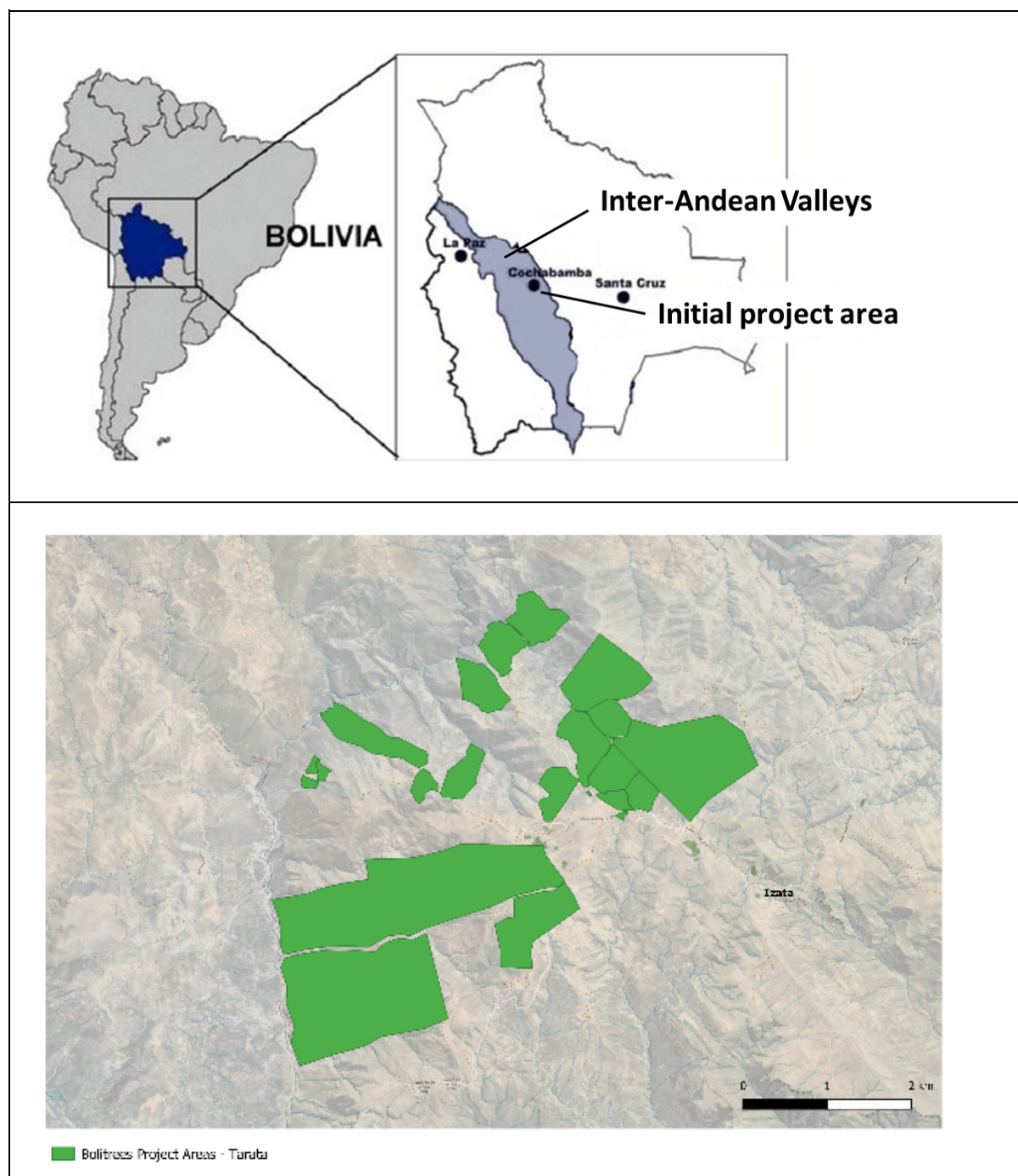
At least 60% of income from the sale of Plan Vivo Certificates will directly benefit the Project Participants and other Local Stakeholders, but the livelihood gains will even exceed these Plan Vivo-related benefits (sale of Plan Vivo Certificates and employment). In particular, all (100% of the) sales of the non-timber forest products including the fruits, the apiculture products and the leaves (traditional medicines) will add direct value to the Project Participants. Indeed, it is the establishment of a local non-timber forest productive economy that will guide the project on the long term. The project initial aim is to establish woodland restoration and agroforestry plots across ca. 1000 hectares in Cochabamba, Tarata. The inter-Andean valleys around Cochabamba have a high potential for reforestation and forest regeneration with environmental co-benefits, such as water infiltration, biodiversity increase and economic income from non-timber forest products (e.g. medicinal plants, fruits and apiculture).

Over time the project area will be gradually extended into neighbouring areas to scale up the project impact.

1.2 Management Rights

1.2.1 Project Boundaries

In Annex 1, we present shapefiles and maps showing the boundaries of the project region and initial project areas. The initial project area is located in Tarata; the project region is the Bolivian Interandean valley.



Project region and initial project area (regional map adjusted from Kessler, C. A. "Decisive key-factors influencing farm households' soil and water conservation investments." Applied Geography 26.1 (2006): 40-60).

1.2.2 Land and Carbon Rights

The legal ownership for rural land in Bolivia is governed by INRA (“Instituto Nacional de Reforma Agraria”) for individuals or communities. All project areas have been cleared by INRA for individual farmers or communities (see annex 3 for an example INRA letter).

Agrarian syndicates are largely responsible to be managing community resources ranging from land, forests, and water, to resolving conflict. The agrarian syndicates were formed by the state during the land redistribution reforms of 1952; over time they have come to function as the central community organization group (Grootaert & Narayan, 2001).

The agrarian syndicate (union) does not have much to do with the labor union, because it is a type of traditional association unified by obligations and rights around the family-communal land position and local political responsibilities (Machicado, 2010). The number of memberships in agrarian syndicates varies by community. For example, in the community of Tunasani there are 39 syndicate members while the community of Yana Rumi has 24 syndicate members. An agrarian syndicate is a social and productive organization managed by the community to regulate internal relations and external links. The usufruct rights of the land belong to the community.

The Bolivian state clearly endorsed and supports carbon credit issuance. The legal framework for Article 6 trading is to be finalised in the near future, and the BoliTrees project will follow the requirements in the legal framework very closely. The project will comply with all the legal requirements. To date, the Plurinational Authority of Mother Earth (APMT), constituted in Law 300: Art. 53, as a strategic and self-governing public law entity with autonomy of administrative, technical, and economic management, under the guardianship of the Ministry of Environment and Water, granted the project a formal Certificate of Registration (Annex 15) with registration number No. APMT – MC – CR – 01/2025. By means of the Technical Report APMT/DMC/INF/00083/25, the Registration of the project proceeded before the APMT, through the Directorate of the Joint Mechanism of Mitigation and Adaptation for the integral and sustainable management of forests and Mother Earth, within the framework of the Regulation for Registration and Adscription of Initiatives, Projects, and Programs in Climate Change, and was formally approved by the APMT on 28/04/2025.

The standard format of the project agreement is shown in annex 12.

Table 1.2.2 Land and Carbon Rights

Project Area	Ownership and user rights status	Carbon rights	Evidence
Tarata – woodland restoration	The community resources (land, forest, water) are managed by agrarian syndicates to resolve conflict (Agrarian Reform Law (Decree Law No. 3464) of August 2, 1953, and Constitución Política del Estado - 2009)	The Plurinational Authority of Mother Earth (APMT), constituted in Law 300: Art. 53, as a strategic and self-governing public law entity with autonomy of administrative, technical, and economic management, under the	INRA Covenant

Tarata - agroforestry plots	Land tenured by individual citizen (private smallholder plot)	guardianship of the Ministry of Environment and Water, granted the project a formal Certificate of Registration (Annex 15)	INRA Covenant
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2 Stakeholder Engagement

2.1 Stakeholder Analysis

2.1.1 Stakeholder Identification

We completed table 2.1.1 to identify and describe the main stakeholder groups that could influence or be affected by the project. We included the likely impact, influence and engagement of each stakeholder group and stated whether they are considered local stakeholders or secondary stakeholders.

The socio-economic conditions and structure of the local stakeholders are described in detail in §2.3 and §2.4.

Table 2.1.1 Stakeholder Analysis

Stakeholder Group	Stakeholder Type	Impact*	Influence	Engagement
Participating communities (starting with 2 agrarian syndicates): starting with 20 smallholders from Tarata	Local stakeholder	Highly positively impacted by the project (e.g. natural fruits, apiculture products and leaves (traditional medicines))	High positive influence on the project through project agreement, community meetings and project co-design	Long-term commitment secured through community meetings, trainings, technical implementation and socio-environmental reinvestments
Individual participants engaged in agroforestry: starting with 20 smallholders from Tarata	Local stakeholder	Highly positively impacted by project (e.g. natural fruits, apiculture products and leaves (traditional medicines))	High positive influence on the project through project agreement, community meetings and project co-design	Long-term commitment secured through agroforestry, training, project agreement, and fruit harvest benefits
Low-level government (municipality of Tarata)	Secondary stakeholder	Moderately positively impacted by the project (e.g. benefiting from this socioecological project in and	Moderate positive influence on the project through general and legal support	Long-term commitment secured through cooperation agreements, aligning

		beyond the Municipality)		interventions and experiences
Instituto Tecnológico Berto Nicoli	Secondary stakeholder	Negligible impact by the project (as located in Cochabamba)	Moderate positive influence on the project (through technical and scientific advice)	Provide advice and technical support in agroforestry practices
CETM	Secondary stakeholder	Negligible impact by the project	Moderate positive influence on the project (through sociotechnical advice)	Provide advice and support to strengthen gender balance in all project interventions
High-level government	Secondary stakeholder	Negligible impact by the project	Moderate positive influence on the project (through legal support)	Involvement through registration letter

*No material negative impacts are associated with the presence of the project, see Annex 10b

2.1.2 Indigenous Peoples and Local Communities

We completed Table 2.1.2 to identify the local communities that have usufruct rights to land and resources in the project areas, while describing their governance structure and decision-making processes and the involvement of women and vulnerable groups.

Table 2.1.2: Indigenous Peoples and Local Communities

Indigenous Peoples or local communities*	Rights to land or resources in the project area(s)	Governance structure	Involvement of women and marginalised groups	Engagement
Quechua communities with usufruct rights to land in all project areas	Common usufruct rights are granted by INRA.	The community members are organized as affiliates to the agrarian syndicate. The syndicate elects a representative through a democratic election (under rotation) and makes decisions through a	Women take part in the agrarian syndicate and the <i>bartolina</i> (woman spokesperson under rotation) actively represents their voice in the discussions	Engaged through project agreements, community meetings, trainings, project interventions and payment of costs

		communal assembly.		
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* In line with CEPAL recommendations the project did not distinguish the “Mestizos” as a separate indigenous group, to avoid ambiguous classifications.

2.1.3 Disputed Land or Resources

The introduction of Eucalyptus and Pinus woodlots throughout Bolivia puts pressure on the indigenous forests. Eucalyptus is a rapidly growing tree species: after merely three years the stem is more than 3m high and 10cm in diameter. This makes it particularly useful in construction work. Meanwhile, Pinus wood is particularly suitable for furniture constructions.

Nevertheless, these exotic plantations come with significant environmental drawbacks. Eucalyptus trees have a very high water consumption (Belachew and Minale, 2025), which causes a lowering of the water table in the landscape, and the toxic Eucalyptus foliage hinder undergrowth, making the landscape more sensitive to soil erosion. The native forests are diminishing in favour of exotic plantations, which negatively affects biodiversity, ecosystem resilience and local knowledge.

The competition for groundwater and the allocation of fertile soils form sources of upland-lowland disputes (not in the project communities, but occasionally in the inter-Andean valleys when upland dams are constructed). The project will foster a switch-back towards the restoration of native forests, by employing indigenous Quechua knowledge and supporting income alternatives by tapping into non-timber forest products/medicinal plants.

2.2 Project Coordination and Management

Misk'i Kausay and Climate Lab are the project coordinator organisations that will take responsibility for the project (see Table 2.2). Climate Lab will act as the Plan Vivo ‘project coordinator’ with the overall responsibility.

We refer to Annex 2 for legal documentation and information (with in appendix information sheets of both organisations). The partnership is sufficiently experienced in engagement with indigenous and vulnerable peoples in the project region. Both organisations signed a partnership agreement.

Climate Lab will take care of the higher-level project activities, such as financing, developing project management guidelines, monitoring plan, and integrated assessment of the project impact. Misk'i Kausay is responsible for managing the project activities on the ground, including administrative bureaucracies and working with the direct beneficiaries of the project who will undertake the activities of the project on the ground. These include farmers, agrarian syndicates, or any parts of the community who can contribute to the project starting from seedling growth to (agro)forest management. For the division of tasks between both organizations, we refer to Table 2.2.

Table 2.2 Responsibility for Project Coordination and Management Functions

Project Coordination and Management Function	Responsible Party/Parties
Stakeholder engagement during project development and implementation	MK
Ensuring conformance with the Plan Vivo Standard and compliance with applicable policies, laws and regulations	CL

Developing technical specifications, land management plans and project agreements with project participants	CL/MK
Ensuring that the PDD is updated with any changes to the project	CL
Registration and recording of management plans, project agreements, monitoring results, and sales agreements	CL
Managing project finances and dispersal of income to project participants as described by the benefit sharing mechanism	CL/MK
Managing Plan Vivo Certificates in the Plan Vivo Registry	CL
Preparing annual reports and coordinating validation and verification events	CL
Securing certificate sales and other means of funding the project	CL
Assisting Project Participants to secure any legal or regulatory permissions required to carry out the project	MK
Providing technical assistance and capacity building required for project participants to implement project interventions	MK
Monitoring progress indicators, livelihood indicators and ecosystem indicators and providing ongoing support to project participants	MK
Measurement, reporting and Verification of Carbon Benefits	CL

2.3 Project Participants

The initial project participants are smallholder farmers from the community of Yanarumi (10 smallholders) and smallholder farmers from the community of Tunasani (10 smallholders). These smallholders are organised under the structure of one syndicate per community. They generally engage in a mixed livelihood strategy of livestock management and agricultural production with a focus on on potato, papa and Tarwi, as well as maize, pea, onion, tomato, lettuce, and others. For a full description of the typical use of land and natural resources, we refer to §3.3.1: Social survey.

Table 2.3 presents the initial and potential project participants and describes their location of residence in relation to the project areas and project region, their main use of natural resources within the project region and their typical use of labour for natural resource management activities.

Misk'i Kausay and Climate Lab signed an ethical charter not to discriminate based on gender, age, ethnicity, religion or social status when selecting project participants; and aim to engage in community-driven fire management to reduce potential for tensions or disputes within or between communities.

Table 2.3: Project Participants (grouped by village, area or region)

Project Participant	Participant Type*	Location of Residence	Typical Land Holding	Land and Natural Resource Use
Communities (syndicates) of smallholders with	Type I	Villages adjacent to the project areas, with communal land rights.	The average land size used for cropping per	Mixed livelihood of agricultural production and

usufruct rights to land in the project areas		Located within the inter-Andes valleys of Cochabamba.	household is 0.1-3 ha. (smallholder private land)	livestock management. Focus on potato, papa and Tarwi, but also maize, pea, onion, tomato, lettuce, and others. For a full description of the typical use of land and natural resources, we refer to §3.3.1: Social survey
Apiculture associations	Type I	The project has the ambition to include Apiculture associations in the near future.	An apiary managed by one family has typically 1-5 bee hives.	The apiaries are located adjacent to the native forest, so they do not hinder the restoration and can use the resources of the native flora.

* Type I = Project participants that do not meet the Type II definition; Type II = Project participants that are not resident within the project area, do not manage land or natural resources within the project area for small-scale production, or are structurally dependent on year-round hired labour for their land or natural resource management activities.

** All of the project communities are potentially suitable for beekeeping, while there are some beneficiaries who already have beehives, and in both communities there are already beekeeping producer associations with several years of experience. Problems that these organizations have are the lack of constant technical advice, and also marketing strategies for their beekeeping products (honey, pollen, propolis, nuclei and others). The project aims to closely work together with individual bee farmers and apiculture associations (through workshops, technical support, materials and marketing support).

1. Participatory Design

At the initial phase of the project, at least 3 meetings were organized with the agrarian syndicates of the communities and the local government authorities. The members of the agrarian syndicates are democratically elected and under-rotation representing the communities in the community council. The election of the members is democratic by acclamation, a consultation is made in a general assembly, where more than 50% of the members must be present. During the assembly the question is raised who proposes to take place in the election, subsequently there is a vote for each person elected, by raising hands, first for the president, and so on until the board of directors is formed. The syndicate represents the community and the community meeting is the assembly of the syndicate. During these meetings, the basic project logic is explained and the potential interest of the community and municipality is discussed, as well as the initial feedback.

The community councils form the backbone of the participatory governance design of the project and are structurally embedded in the (bi)monthly meetings of the agrarian syndicate. For day-to-day follow-up of project activities, the community established a “*Project Directorio*” with community representatives that follows-up closely on the project and reports to the community council (using phone or during meetings).

Group discussion within the community councils are organized on the livelihood challenges of the community, but also to ensure that the communities have an understanding of climate benefits. If applicable, monitoring responsibilities are discussed.

Participation of women in the community meetings is actively encouraged, by striving towards 50% female participation. The project has partnered with the “Centro de Estudios y Trabajo de las Mujeres” (CETM) to support in achieving this goal. The CETM (Centro de Estudio y Trabajo de la Mujer) supports the establishment of female managed agroforestry plots. The CETM covers 50 % of the initial investment costs for the agroforestry plots, including the construction of circular ponds (from 30.000 up to 200.000 litres) and technified irrigation systems. By working directly with women they manage to strengthen the position of women in the rural society. Women participation is stimulated by inviting women to all meetings. If desired, separate women meetings can be organized to disentangle their perspective.

The project also performed one-to-one semi-structured interviews near the project areas in order to gain in-depth understanding of the socioenvironmental dynamics and livelihood challenges in the region. Interviewees were identified during the community meeting on a voluntarily basis. There was a high interest, ca. 50% of the syndicate members participated in the interviews. Subsequently, the project design is shaped to fit the local context.

We provide evidence of stakeholder involvement in the participatory design process in Annex 4.

2.4 Stakeholder Consultation

2.4.1 Design Phase Consultations

During the very first phase of the project activity, awareness and general acceptance of target communities was ensured by (i) performing interviews in the project area, as well as (ii) having several meetings with the communities/syndicates. During the very first community meetings, the basic project logic is explained, and potential interest of the community is discussed, as well as the initial feedback.

Thereafter, a separate meeting is organised to train the community in the responsibilities and commitments integrated in the Plan Vivo project, Plan Vivo methodology, and subsequently ‘planes vivos’ (land management plans) are created (see more in §3.14).

We refer to annex 4 for a brief sequence of key events that were part of the stakeholder consultations.

2.4.2 Stakeholder Engagement Plan

The project initiated with community workshops and qualitative interviews in the project area to ensure a successful collaboration and a fitted project, benefitting the local community. Issues raised during these first consultation rounds have been incorporated in an improved project design. For example, when setting up the participative decision making structure of the project, the community asked to integrate the design within the existing structure of the syndicate and to establish a “project directorio” for day-to-day management. The communities also recommended the inclusion of shrubs

in the early planting stage (for shading and medicinal herbs) and to nurture horticulture species in the nurseries to provide short term benefits.

Every decision will be held through a democratic vote within the syndicate with a majority vote decision system, which is also the current decision mechanism in the community meetings. Youngsters are actively encouraged by their families to participate in the monthly community meetings, even if they are studying in the city. At present the gender balance is about 70/30 representing respectively men and woman. Participation of women in the syndicates will be actively encouraged jointly with CETM. Women's participation may be stimulated by organizing separate meetings with female syndicate members where they can express their opinion separately and where they can prioritize their needs. Overall, the project aims to integrate gender equality into the project design.

This is important because the traditional rural work division between men and woman is often different. As stated by interviewees, often the men are responsible for the more "physical work", such as preparing the soil, planting, weeding and harvest, whereas women are responsible for the more "delicate work", such as cooking, wood collection and livestock care. The project aims to incorporate all perspectives by integrating both gender groups in the decision-making process – if needed via separate meetings and parity voting.

All community members are trained in the Plan Vivo responsibilities and commitments by the project, to optimally manage the land (enrichment planting of trees, water conservation, medicinal plants cultivation, recollection). Regular discussion sessions, training sessions, and workshops are organized together with the local coordinator and (if relevant) the local authorities. Technical trainings with practical toolkits are shared in Spanish and Quechua during the community workshops. Community training workshops and nursery trainings are generally organised every quarter. Once or twice per year, municipal authorities are updated on the project progress and invited to the project areas.

Complaints and suggestions that are raised during the (annual and monthly) meetings, in satisfaction surveys, or walks around the project areas are recorded by the project coordinator in a "complaints and suggestions logbook". This logbook is stored together with the "libro de actas" of the community, which holds the meeting agreements of all community meetings and acts as the community secretariat. The syndicates elect an arbitrator through democratic election to handle community disputes.

The logbook is regularly updated and scans are digitally available. Where possible, remediating actions – following complaints and suggestions – are taken. The project coordinator is responsible to organise consultation rounds (if required by a community council) and remediation actions. In case the dispute remains unsolved, an arbitrator is consulted.

At least every 5 year, a monitoring round is performed. This assessment also includes semi-structured interviews and group discussions with the communities.

On top, the project also works together with the following structures:

- (i) Associations. Associations are groups of citizens and households, working together for a common goal. For instance, the project works with woman and apiculture associations in the project areas, such as CETM.
- (ii) State administration. The project coordinators work in collaboration with the state's administration. The project works together with the different municipalities at the local level and with Fonabosque (the national forest development institute under the Ministry of Environment and Water) at national level.

2.5 Free, Prior and Informed Consent (FPIC)

2.5.1 FPIC Legislation

We completed Table 2.6.1 to identify any national legislation or legal obligations under the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP), and International Labour Organization Indigenous and Tribal Peoples Convention 169 (ILO 169).

The measures in place to ensure that the project complies are included in the ethical charter. The community consent is annually re-confirmed on the yearly community meeting.

Table 2.6.1: National Legislation and International Standards on FPIC

Legislation/S standard	Relevance to Project	Compliance Measures
UNDRIP	Article 8.2. One shall provide effective mechanisms for prevention of, and redress for: [...] (b) Any action which has the aim or effect of dispossessing them of their lands, territories or resources; (c) Any form of forced population transfer which has the aim or effect of violating or undermining any of their rights	The project recognizes that the participant communities have the right to the project lands, territories and resources which they have traditionally owned, occupied or otherwise used or acquired. The communities have the right to own, use, develop and control the project lands, territories and carbon benefits in line with the project agreements
ILO 169	Article 6.1. In applying the provisions of this Convention, one shall: (a) consult the peoples concerned, through appropriate procedures and in particular through their representative institutions, whenever consideration is being given to legislative or administrative measures which may affect them directly; (b) establish means by which these peoples can freely participate, to at least the same extent as other sectors of the population, at all levels of decision-making in elective institutions and administrative and other bodies responsible for policies and programmes which concern them; (c) establish means for the full development of these peoples' own institutions and initiatives, and in appropriate cases provide the resources necessary for this purpose.	The project recognizes that the participant communities have the right to the project lands, territories and resources which they have traditionally owned, occupied or otherwise used or acquired. The communities have the right to own, use, develop and control the project lands, territories and carbon benefits in line with the project agreements. All consultations carried out are undertaken in good faith and in a form appropriate to the circumstances, with the objective of achieving agreement or consent to the project.

2.5.2 FPIC Process

In Plan Vivo Projects, the term FPIC is used to describe the principles for the negotiation of conditions under which a Project is designed, implemented, monitored, and evaluated:

- ▶ Free = consent is given voluntarily and without coercion, intimidation, or manipulation.
- ▶ Prior = consent is sought sufficiently in advance of any authorization or commencement of activities to allow time to understand, access, and analyse information on the proposed activity.

▶ Informed = information provided prior to seeking consent is accessible, objective, and complete.

▶ Consent = a collective decision (“Yes”, “No”, or “Yes with conditions”) made by the rights-holders following their own timelines and decision-making processes with the option to reconsider if the proposed activities change or if new information relevant to the proposed activities emerges.

As explained above, FPIC is safeguarded through the *agrarian syndicates*, which are meetings of a group of individuals or households from the whole community that has come together in a shared interest at the invitation of the project team. These meetings must be organised well before the start of project activities (in a new project area), with more than 50% members present (i.e. >12) and with the following mutually agreed upon *modus operandi*:

- Selection of participants;
- Open to all other neighbours or people who are interested without exclusions;
- Participation of association members, if applicable;
- Explanation of the initial project aims with request for first feedback;
- Creating plan vivo maps, as explained above, of which the participants receive a copy;
- Agreeing on socioenvironmental investments, based on the project agreement;
- Majority voting system within syndicate to formalize possible consent;
- Female participation grade of >30%;
- Agreement with the formal village structure (municipality)
- Nomination of representatives to sign the project agreement on behalf of the community.

Syndicates received land-use maps, the benefit-sharing plan, and the risk assessment in Quechua and Spanish before voting. At least 3 meetings were needed for deliberation. During all meetings, more than 50% of the syndicate members should be present (i.e. more than 12). If a syndicate would vote in majority to reject the project, the project would not engage with this community. If the syndicate would vote in majority to accept the project, the project would proceed but only on those fields of those smallholders who wish to join. Those smallholders not wanting to participate will not join.

The syndicate is thus free to vote against entering the project intervention after all information is provided and before the project started. On top, every individual smallholder is free to join or not. Yet, once the community or smallholder farmer entered in the project agreement, this agreement is binding for the project areas included. The community obviously remains the right to vote against future expansions. If communities or smallholder farmers propose to opt-out of the project, the project starts a dialogue to understand their rationale and look for remediating solutions, including replanting and additional training in case of underperformance. In the event that remediation would not be successful and communities or smallholder farmers still chose to opt-out, milestone-based payments are withheld and the credits lost will be replaced by reallocating the equivalent number from the Achievement Reserve.

2.5.3 Initial FPIC

We refer to §2.5.1.

3 Project Design

2. Baselines

3.1 Baseline Scenario

We refer to Annex 7 for the description of the baseline scenario based on the approved methodology PM001.

Currently, the ecosystem restoration planting areas basically consist of patches of highly degraded bushland (see Annex 1). Without improved management and seedling planting, we can reasonably expect a stable system where future carbon sequestration will be very limited.



Figure 3.1: Illustrations of baseline conditions in Tarata.

In Annex 7, we present sentinel-2 derived False Color Composites of the Tarata landscape between 2016 and 2022 (Google Earth Engine, 2023). Spectral band 8 of the Multispectral Imager (MSI) delivers the chlorophyll-reflecting central wavelength of 842 nm (Visible and Near Infrared, VNIR), suitable for mapping biomass content, as well as at detecting vegetation changes. The spatiotemporal analysis shows no vegetation increase in the project patches of Tarata (2016-2022). The satellite images corroborate the degradation and stability of the landscape within the project patches.

3.2 Carbon Baseline

We completed Table 3.2 to provide a summary of net-greenhouse gas emissions from all initial project areas under the baseline scenario for each year of the first project period; the table is presented in Annex 7. For details of the calculations, we refer to Annex 7.

Table 3.2: Expected Carbon Benefits Summary

Project Intervention	Initial carbon stock (tCO ₂ e/ha)	Baseline Emissions (t CO ₂ e/ ha)	Project Emission (t CO ₂ e/ha)	Leakage Emissions (t CO ₂ e/ha)*	Carbon Benefit (t CO ₂ e/ha)
Silvopastoral forest plots	0	0	-319	0%	-319
Fruit orchard	0	0	-345	0%	-345

* Based on AR-TOOL15 version 2.0 to estimate leakage significance: A/R Methodological tool – Estimation of the increase in GHG emissions attributable to displacement of pre-project agricultural activities in A/R CDM project activity (see Annex 7 - Leakage).

3.3 Livelihood Baseline

1. Initial Livelihood Status

The project performed individual semi-structured interviews near the project areas in order to gain in-depth understanding of the socioenvironmental dynamics and livelihood challenges in the region. Interviewees were identified during the monthly syndicate meetings on a voluntarily basis. There was a high interest, as 10 syndicate members of Yana Rumi and 10 syndicate members of Tunasani participated in the interviews. Sections below are based on the interview results and on the explanations provided by the syndicate members.

All participants are Quecha, the majority (75%) were male and on average the respondents have 4 children per household. There are 47 members in the syndicate of Tarata. They are mainly involved in agricultural production and livestock management. Tarata has electricity, drinking water, and mobile phone network access, but still there is no access to sanitation and a lot of people move to the city to have a better lifestyle.

Most common crops above 2700 m a.s.l. are potato (*Solanum tuberosum*), papa oca (*Oxalis tuberosa*) and Tarwi (*Lupinus mutabilis*). At lower elevations (<2700 m a.s.l.) a wide variety of cultivars can be sown such as maize, pea, onion, tomato, lettuce, and others. All the participants are active in agriculture and 10% of the respondents have a second job in another sector (construction, transport). A daily labourer earns about 100 Bolivianos (bol) per day (~around 15 USD); others may work as a truck driver. As a reference the GDP per capita in Bolivia in 2022 was recorded at 21566 Bolivianos.

Nearly all (95%) of the correspondents grow potatoes. Per hectare, one can harvest up to 80 “cargas” (equal to 8 tonnes of potatoes). In Tarata, trigo and maize are also common, while the average yield is lower (around 1.7 tonne per hectare).

The agricultural lands are prepared for sowing in October, sown in November (at the onset of the rain season) and harvested after the rainy season in April. In case of irrigation, an additional crop cycle can be cultivated during August and December. The agricultural lands are generally organized in a 5-years rotational cycle. The first two years are cultivated with potato (“papas”), followed by subsequently Oca, Avena (forage oats) and Tarwi – and thereafter a fallow period of 5 years.

Syndicate members in Tarata cultivate around 1.5 ha/family, on average half for sale at the local market and half for auto consumption. Farmers also have access to communal land for grazing, the allocation of which is decided during village meetings. Access to grazing land is allocated during standard syndicate decision making. A grazing monitoring system is designed to monitor communal grazing (and to avoid displaced grazing, the project will plant fodder trees, which provide livestock fodder for stable feeding). Apart from a pair of oxen (“yunta”), which is owned by practically all families and which is used solely for soil preparation, livestock ownership in most cases also includes either horses or donkeys, sheep, pigs and poultry. The average amount of cattle in Tarata is 3 animals (cows). Over one third of the cattle holders are selling the animals at the market in Puñata, while 18% keep them for breeding (and others did not answer the question). Bulls usually sell at 2000 bol; cows at 1500 bol; dairy cows at up to 5000 bol and sheep may be sold at 200 bol.

The main water sources in the municipalities are the river and streams from the hills. In Tarata about half of the respondents have experience with agroforestry. Nearly all syndicate members (95%) are

aware of deforestation occurring after the year 2000. Most participants indicated the year 2000 as the year when the forest had the largest surface and most also indicated the year 2010 as the year when the forest was most degraded.

As causes of deforestation, all participants point to fires, wood cutting, firewood collection and plantation of exotic species (*Eucalyptus* and *Pinus*). Mentioned reasons to plant exotic species include wood for construction/furniture/scaffolding (80% of participants), firewood (80%), and oxygen (5%). Cooking happens with firewood (sometimes with charcoal) gathered from the direct vicinity or bought downslope and transported by donkey/horse (about two hours walking). Firewood usually costs about 15 bol for 1 bundle of firewood. Fires would be mainly caused by humans (not accidentally) to clear agricultural fields and also to create grazing land. Sometimes fire may spread to nearby areas.

Interviewees explained how they use the forest for wildlife (guinea pigs) hunting (75%), firewood resources (90%), and construction wood (85%). Furthermore, few of the interviewees see any cultural value in the forests, although all of them want more access to the forest.

Interviewees have some similar ideas about the main community needs. In Tarata, most respondents point to the lack of water sources and the need for water harvesting and irrigation.

3.3.1 Expected Livelihood Change

According to 75% of the interviewees, drought is a significant problem as it has altered grazing and farming activities, followed by frost. About one fourth of the participants said that there was no real livelihood change over the past decade. These statements by the interviewees are corroborated and summarized by Rangecroft et al. (2013), “in the tropical Andes, mountain station records showed that annual average temperatures increased by 0.1 °C/decade between 1939 and 1998, higher than the global average rate of 0.06 °C/decade (Bradley et al. 2006; Vuille et al. 2008). Recent temperature increases have tripled in the Andes (~0.33 °C/decade from 1980 to 2005) (Barry 2005) and these, allied to changes in precipitation, consequently led to glacier recession across the whole of the Central Andes (Francou and Vincent 2007) and to both direct and indirect livelihood impacts (see Figure 3.3.2). However, there are few instrumental observations available above 4000 m where Andean glaciers exist and therefore the impact of recent temperature change on glacier behavior is poorly documented (Bradley et al. 2006).

A changing climate is predicted to have serious consequences for the hydrological cycle in the Andes through temperature increase and changes to precipitation patterns (Barnett et al. 2005). Model projections suggest that the rate of warming in the lower troposphere is likely to increase with altitude, impacting high mountains (Bradley et al. 2006). Continued warming is projected across much of South America; IPCC model projections suggest warming of 0.4–1.8 °C by 2020 and 1.0–7.5 °C by 2080 (Magrin et al. 2007). While many global climate models disagree on the extent and direction of the changes in precipitation for South America, a number of them predict considerable drying in the region (Magrin et al. 2007; Viviroli et al. 2011).

Global and regional projections of precipitation rely on models which, due to their coarse spatial resolution, are not capable of resolving the fine spatial patterns in temperature and precipitation that exist over small areas in regions of high relief such as the Andes. As a result, climate change impacts are not well captured by these models in fine enough spatial resolution to allow adequate water supply planning to be undertaken (Vergara 2009). Furthermore, there is a difference in the spatial scale between data gained from global climate projections and data needed for water resource management (Buytaert et al. 2010). Climate models run at too coarse a resolution produce a smoothing out of local precipitation and temperature gradients which are important for many local

hydrology processes. Therefore, the downscaling of climate projections is necessary (Buytaert et al. 2010).

Whilst acknowledging the uncertainties surrounding climate projections and the need for downscaling, current models do all forecast changes in precipitation patterns and increases in temperature. These changes will lead to continued glacier recession and will all significantly affect water availability in Bolivia.”

All in all, water security across the Bolivian mountain regions is threatened by glacial recession with Bolivian glaciers losing nearly half their ice mass over the past 50 years raising serious water management concerns. The declines in water supplies have critical negative impacts on water security, affecting environmental, economic and social systems (Bradley et al. 2006; Bigas et al. 2012) – as summarized by Rangecroft et al. (2013) in the figure below.

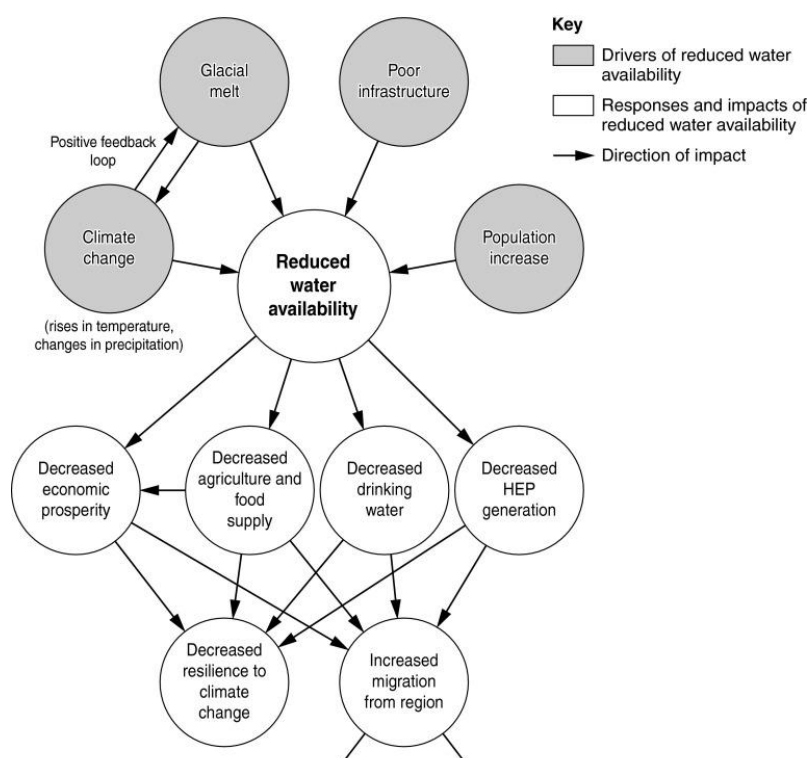


Figure 3.3.2: Network diagram outlining the drivers of Bolivian water scarcity and impact relationships (adapted from Stewart 2010). Gray circles represent drivers of reduced water availability and white circles represent the responses of reduced water availability and further impacts. In addition, the increase of forest fires will also likely impact water availability in the project region.

3.4 Ecosystem Baseline

3.4.1 Initial Ecological Conditions

The project is geologically located in the Inter-Andean geomorphic zone, between the Eastern Cordillera and the Sub-Andean fold and thrust belt (see figure 3.4). The geology of the project area is characterized by deep rich alluvial soils formed from sedimentation processes of the Quaternary period.

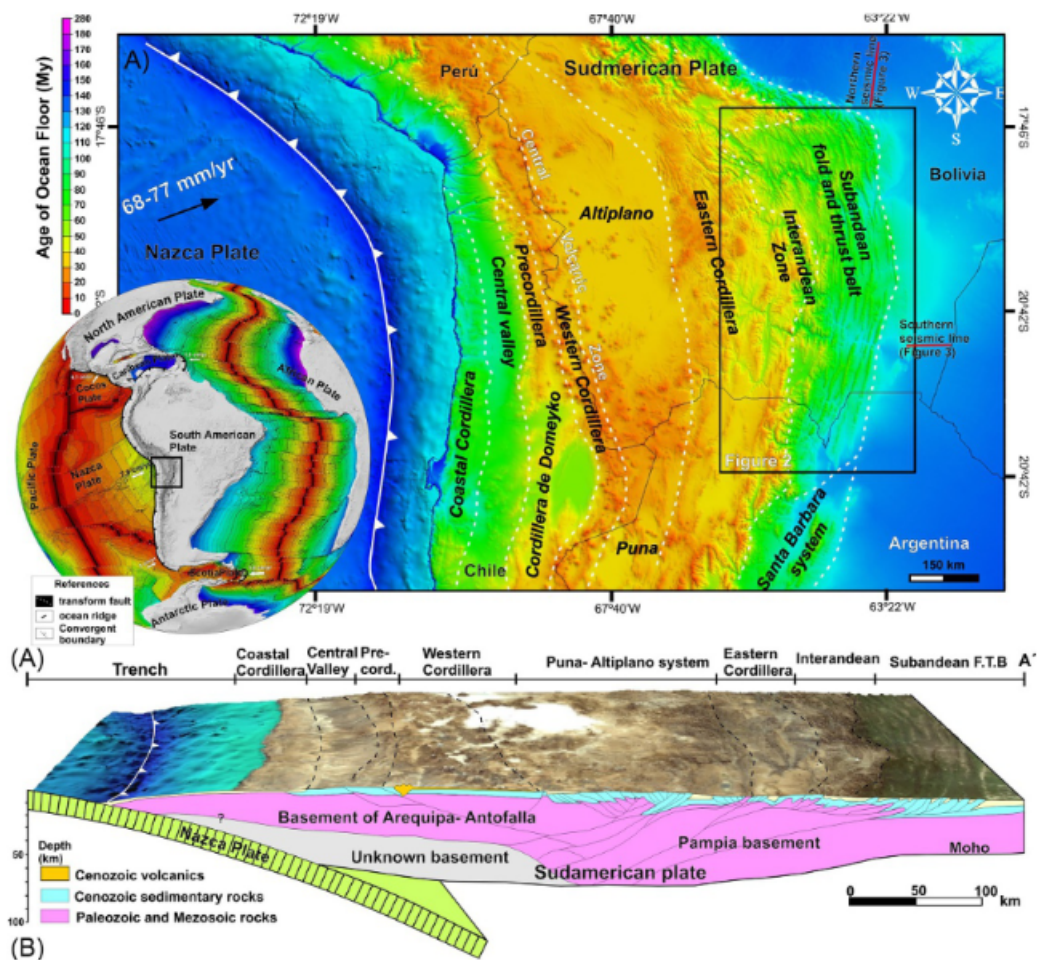


FIG. 1

(A) Location and tectonic framework of the study area, main geomorphological provinces from West to East are: The Coastal Cordillera, the Central Valley, the Precordillera-Cordillera de Domeyko system, the Western Cordillera, the Altiplano-Puna system, the Eastern Cordillera, the Interandean Zone and the Subandean fold-thrust belt; (B) Regional Tectonic plate configuration (modified from Ramos et al., 2004).

Figure 3.4.1: Geomorphologic zones of Bolivia (from Structure and tectonic evolution of the Interandean and Subandean Zones of the central Andean fold-thrust belt of Bolivia by Rojas Vera et al., 2019).

The area is characterised as environmentally diverse, because of its geographic position, located at the edge of the eastern slopes of the Eastern Cordillera. The inter-Andean valleys form a mosaic of ecosystems with high ecological diversity and richness, differentiated mainly by altitudinal gradient and bioclimatic regime. In general, xeric ecoregions in the country are under protected. The Inter-Andean Dry Valleys cover only ca. 0.5% of the protected area, in spite of their diverse flora and status as one of Bolivia's most important centres of endemism (López et al. 2006). López et al. 2003, made a quantification and characterization of the floristic richness and endemism levels of the inter-Andean dry valleys of Bolivia. If introduced species are excluded, the percentage of specific endemism is set at 18%. The most important families by number of species are *Compositae*, *Cactaceae*, *Gramineae*, *Leguminosae*, *Solanaceae*, and *Bromeliaceae*. Among the most speciose genera we find *Tillandsia*, *Baccharis*, *Solanum* and *Parodia*. Other genera, such as *Rebutia*, *Cleistocactus*, *Trichocereus*, *Salvia*, *Acacia*, and *Prosopis* confer a distinct identity to these dry valleys. Apart from endemic taxa, the dry valleys possess other genera and species with restricted distribution in South America.

The area consists of different altitudinal ecological levels, from montane to sub-Andean. The project area in Tarata comprises three ecological floors: the valley, prepuna and puna floor.

Table 3.4 Characteristics of the ecological levels in Tarata.

Ecological level	Bioclimate zone	Altitude (masl)	Key tree species
Valley	Semi-dry to dry	1850-2600	Tara, Soto
Pre-puna	Subhumid	2600-2900	Tipa, Jacaranda, Molle
Puna	Subhumid	3000-3500	Kewiña

In ecological terms, the xeric bioclimate is typical for the lower zone of the inter-Andean valleys with a dry ombrotype. At higher elevation, above 2600 masl, a subhumid bioclimate is found.

Semi-deciduous or seasonal evergreen forests develop on river terraces, alluvial plains, piedmont glaciers and alluvial fans, and on soils of varied textures that at least seasonally have the presence of shallow water tables accessible to the roots of trees and large shrubs.

In the lower lying and dryer slopes of Tarata the vegetation is characterised by a mix of Algarrobo, Tara, Jacaranda, Jarca, Molle and Ceibo trees. Smaller trees and shrubs in the project area are typified by Aliso (Alnus), Tola, Chacatea, Muña muña and Wira wira.



Figure 3.4.2 – Illustrations of indicator tree species. From left to right: Tipa, Jarca and Molle in Tarata.

At present, it is undeniable that agricultural clearance and animal overgrazing has caused severe degradation.



Figure 3.4.3: illustration gully erosion (left) Gullying in project area Yanarumi, 2022; (right) Pedestal erosion in project area Sub Central de Izata, 2022.

In Izata, there are also several endemic fauna species of great interest such as the Red-fronted Paraba (*Ara rubrogenys*), the Andean Cat (*Leopardus jacobita*) and the Monterita (*Poospiza garleppi*). Other fauna species include, among many others, small mammals such as weasel, rabbit, guinea pig, and field mice. Note that the Andean cat (*Leopardus jacobita*) is listed as Endangered on the IUCN Red List while the Cochabamba mountain finch (*Poospiza garleppi*) is classified as endangered by the International Union for Conservation of Nature (IUCN).

The mean annual temperature in the Cochabamba area is 17.6°C, with lowest temperatures occurring between May and August and the highest ambient temperatures in November. The total average rainfall of around 458 mm per year spreads mainly over a period of five months with the highest rainfall during December and February (GeoKlima 2.1).

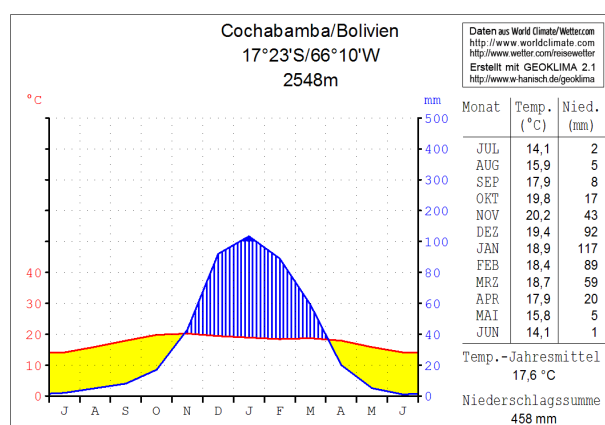


Figure 3.4.4 Climatogram of Cochabamba

Rainfall in DJF (December-January-February) in the region is the result of the South American monsoon system (SAMS), resulting from the interaction of the Chaco low, Bolivian high, low-level jet (LLJ), and South Atlantic convergence zone (SACZ). This is described as followed by Seiler et al. (2012):

“In austral summer (DJF) a low pressure system called Chaco low intensifies at 25°S, enhancing the easterly trade winds to transport moisture from the northern tropical Atlantic into the continent. Deflected by the Andes, moisture is transported south-ward from the Amazon to subtropical plains by a low-level jet (LLJ) located at about 925–850 hPa (~1 km MSL) and <100 km east of the Andean slopes (Marengo et al. 2004). This leads to enhanced precipitation with a southeastward extension toward the Atlantic Ocean, referred to as the South Atlantic convergence zone (SACZ).

Simultaneously, the release of condensational heat over the Amazon and Andean slopes leads to the formation of the upper-level Bolivian high at 200 hPa (~12 km MSL) (Lenters and Cook 1997), which further enhances moisture advection from the Amazon to the Bolivian low- and highlands (Vuille 1999). Together these form the main components of the South American monsoon system (SAMS), which causes rainfall in DJF. In austral winter (JJA), the Chaco low and the SACZ weaken, leading to less moisture transport from the north.”

2. Expected Ecosystem Change

Deforestation in central Bolivia was relatively slow until the mid-1980s when it started to accelerate steadily until 2000. The rate has since remained at a high level, at an annual rate close to 0.5%. The greatest deforestation phases have occurred in the lowlands, and from 2001 to 2020, the country has lost 6.11 Mha tree cover and experienced a decrease of 9.5% in forest cover since 2000 (contributing around 1.86Gt of CO₂ emissions) (Andersen, 2015). Until 1986, deforestation was concentrated around Santa Cruz as well as in parts of the Yungas of La Paz and Alto Beni. Between 1986 and 2001 there was a very clear advance upwards. As a consequence, the area has been classified with a high desertification index (UN. CEPAL, 2012).

The largest proportion of forests being degraded is in the tropical areas of Cochabamba, where secondary forests are cleared by small-scale agriculture (Müller, 2020). For instance, there has been significant deforestation since 2020 in the province of Chapare. The area lost 3.35 kha of tree cover, equivalent to 1.23Mt of CO₂ of emissions. The reforestation efforts of the '80s, mixing native species with exotic species, has introduced the presence of Paradises (*Melia azedarach*), Eucalyptus (*Eucalyptus globulus*), and Pines (*Pinus radiata*) in the area (Vargas-Claros, 2021).

Due to continued land degradation, reforestation plans have been implemented as an income generating and ecosystem strategy. Most of the forests are plantations of Eucalyptus and Pinus and, although the objective of generating income has been achieved, the effects of this policy on the native forest ecosystem and the sources of water have been negative (a.o. because of a high groundwater demand and toxins released from the foliage). Under a eucalyptus forest, the cover and natural pastures disappear and water sources dry up.



Figure 3.4.5: Eucalyptus plantation in Piusilla, note the absence of undergrowth and subsequent high erosion rates.

Considering the situation of the last 30 years, IPCC (2019) wrote in this perspective: “Deforestation not only affects the climate by increasing the atmospheric level of carbon dioxide but also affects by inhibiting water recycling, soil degradation and reduction of biodiversity”. Deforestation and land degradation in the project area is strong and connected to (1) uncontrolled fire, (2) growth of small-scale agriculture, (3) introduction of fast growing exotic species, (4) the use of wood for cooking and heating (“leña”) and (5) expansion of cattle ranching to forest areas. Other drivers named by community members are felling of trees to prevent the growth of thorny species (such as Cactacea and Algarrobo).

The frequency of fire outbreaks is increasing, as a result of increased droughts and excessive heat, grasses tend to be more susceptible to uncontrolled fires. Fires are set to clean the agricultural plots of weeds and crop residues in Tarata.

Based on the data from Global Forest Watch (2025), from 2002 to 2024, Cochabamba region lost 140 kha of humid primary forest, making up 47% of its total tree cover loss in the same time period. Total area of primary forest in Cochabamba decreased by 7.0% in this time period. From 2001 to 2024, Cochabamba lost 310 kha of tree cover, equivalent to a 11% of the 2000 tree cover area. Including tree gains, from 2000 to 2020, Cochabamba experienced a net change of -58 kha (-2.1%) in tree cover. The net trend is thus negative, which can be expected to continue over the coming decades.

The natural forest vegetation provides important social and environmental services: reducing soil loss to erosion, caused by poor vegetation cover, increasing water availability and protecting the natural biodiversity with medicinal bushes. Many communities have placed a small part of the common forestland under protection, mainly to ensure members’ access to forest biodiversity in the form of medicinal plants and other non-timber forest products (Bottazzi, 2014). Yet, these are threatened by encroaching agricultural expansions.

Together with natural forest, traditional agroecological knowledge is disappearing, which may disproportionately affect the rural Quechua population. There is a need for reviving Quechua knowledge on the ecosystem services that are provided by the natural vegetation ecosystem of the central Bolivian Andes. An important element is the traditional use of medicinal plants, which

represent an effective, accessible and available alternative to western pharmaceuticals, but also allows to reconnect with the traditional cultural society. Examples of these medicinal plants are Wira Wira, Muña Muña, Chamomile and others. A better understanding of the traditional socio-ecological and economic value, will allow to revalorize the natural ecosystems. There is a need to act now, before the traditional Quechua knowledge is lost together with the natural vegetation.

Theory of Change

3.5 Project Logic

We completed table 3.5 to provide a summary of the causal links between project activities and expected outcomes and key assumptions. We refer to §4 for risks and mitigation measures.

Table 3.5 Project Logic

Aim			
Reviving the ancestral Quechua agroecological balance by combining agroforestry downslope with woodland restoration upslope to support sustainable livelihood across the inter-Andean valleys.			
	Description	Assumptions	Risks
Outcomes			
Carbon Benefit	Towards and beyond 1000 ha community land under agroforestry and woodland restoration, including forest protection, management and enrichment planting. The project expands to adjacent areas to scale-up the project impact.	Involvement of communities as project designers will build a strong project support base. Community-based grazing management in dedicated zones will alleviate pressure from the project areas. Precise planting beds in the dry season to enhance tree seedling growth and improved water conservation with water reservoirs to trap runoff water.	R1: Social and political risks: • The selection of target groups creates social bias. • Political opposition to the project R5: Administrative • Capacity of the project coordinator to support the project is not maintained • Technical capacity to implement project activities is not maintained
Livelihood Benefit	The community councils organized by the agrarian syndicate form the basis of the project design. Smallholder farmers are engaged in agroforestry planting. The project supports the production of non-timber forest products such as fruit trees, honey	Frequent community meetings are organised and trainings are provided on improved forest management and non-timber forest products, including honey.	R2:Economic risks: • Insufficient incentive to support project activities • Community support for the project is not maintained • External parties carry out activities

	and medicinal herbs; to provide an additional income streams for rural smallholder farmers. Socio-ecological challenges are tackled by community decisions using socio-environmental investments.	Co-financing and activating community investments may help to tackle socioecological challenges. Fruits, apiculture products and other products from agroforestry can be effectively sold at local markets	that reverse climate benefits; rights to benefits are disputed
Ecosystem Benefit	The project areas are protected and undergo enrichment planting with indigenous tree species to accelerate natural vegetation regeneration and provide a biodiversity habitat.	The restoration areas are protected by community members. Their role is mainly to engage in woodland restoration and agroforestry planting and engagement with communities.	R3: Environmental • Extreme weather: drought and floods • Pest and disease attacks • Fire R4: Leakage of carbon benefits • Project leads to displaced grazing • Project activities fail to deliver expected benefits
Outputs and activities			
Output 1	~1000 ha community land are undergoing woodland restoration and agroforestry planting.	Strong involvement of communities as project designers, will build a strong project support base.	See above
Activity 1.1	Strong involvement of community members in the project management, defined in community project agreements. The restoration areas are protected by community members.	Fire, grazing and illegal logging in project areas is to be strictly monitored by the project.	
Activity 1.2	Installing water conservation structures, to trap runoff water.		
Activity 1.3	Provide trainings on sustainable forest and water management.		
Output 2	Increase in indigenous vegetation cover as a result of agroforestry activities with amongst others	Endemic species includes Molle, Aliso,	

	enrichment planting and conservation efforts.	Algarrobo, Tara, Jacarda, Jarca, Molle and Ceibo.	
Activity 2.1	Establishing new nurseries provides seedlings for (agro)forestry planting in project areas.	Monitoring of the progress of woodland restoration and agroforestry planting in the project areas in line with the monitoring plan.	
Activity 2.2	Enrichment planting with up to 600 endemic trees per hectare in woodland restoration areas		
Activity 2.3	Monitoring progress (biomass, , biodiversity) in line with the monitoring plan	The community is interested in establishing local nurseries with endemic and naturalized species The planted trees are well managed and follow the growth curve as predicted	
Output 3	The community members are implementing the socioenvironmental changes they envisaged.	Strong relationships with governmental and scientific partners Female participation grade of >30% in community meetings is required for making decisions on socioenvironmental investments	
Activity 3.1	Pre-project and annual community meetings with the agrarian syndicates of the different project areas.		
Activity 3.2	Providing annual trainings in agroforestry, apiculture and other non-timber forest products (such as medicinal herbs).		
Activity 3.3	Creating smallholder and community benefits through socioenvironmental investments		

Technical Specification

The Technical Specifications are based on the PM001 Agriculture and Forestry Carbon Benefit Assessment Methodology; we refer to Annex 6 and 7.

3.6 Project Activities

We completed Table 3.6 to provide a summary of the main project activities and inputs for the project intervention. We also refer to Table 3.5 and the separate technical specifications in Annex 7.

Table 3.6 Project Activity Summary

Woodland restoration and agroforestry: Project Activities and Inputs

At a strategic level, the project developed a landscape vision for socioenvironmental regeneration. The vision is based on a balanced agroecological system rooted in Quechua tradition, combining agroforestry mixed fruit orchards in the valley and woodland restoration with non-timber forests at the slopes. Introducing this balanced agroecological system will provide an alternative to the current deforestation and monoculture activities.

3.6.1 Assisting the smallholder farmers to establish tree nurseries

New local nurseries are established (or support is provided to strengthen existing nurseries). Two types of nurseries are constructed: forest tree nurseries for enrichment planting on the slopes and fruit tree nurseries for mixed fruit orchard plots in the valleys.

Forest tree nurseries consist of native tree species, with among others, Molle, Tara, Algarrobo, Jacaranda, Jarca, and Ceibo tree species. A forest nurseries can grow 10,000 to 20,000 tree seedlings annually at full capacity.



Photo 3.6.1a: Example of project nursery in Tarata, with production of native forestry species, fruit species and vegetables for community members.

Fruit trees are grown in a greenhouse nursery. Fruit tree species consist, among others, of apple, peach, papaya, avocado and tumbo trees. A greenhouse fruit tree nursery can grow 2500 seedlings at full capacity. Fruit trees can be planted in the mixed fruit orchard plot after two years and need five years before they start to produce fruits. The first year the seedlings are grown in a greenhouse, the second year the seedlings are placed in a shadow nursery for acclimatization and the third year the tree seedlings are planted in the agroforestry plot. After two years in the plot, the trees start to produce fruits.



Photo 3.6.1b: Project greenhouse nursery for growing tree seedlings, example from Tarata.

3.6.2 Assisting the smallholder farmers in setting-up and manage agroforestry plots

For the purpose of establishing agroforestry plots the project collaborates with CETM (“Centro de Estudios y Trabajo de la Mujer”). CETM support rural smallholder families in establishing Dynamic Agroforestry Systems (SAF – D). In their activities CETM works directly with woman, to strengthen their position and to create gender equal social relations. The high diversity of agroforestry products can be sold to the local market or can be used for self-consumption, providing food security.

By creating awareness during trainings and by empowering the communities in sustainable management, they will be able to shift towards more resilient agricultural production methods in balance with the natural ecosystem.

Detailed annual action plans, stipulating the frequency of technical activities for the nurseries, agroforestry plots and apiculture activities, are included in appendix C of the Technical Specifications.

3.6.3 Tapping into the natural resources of woodland restoration (non-timber forest products).

Assisted growth of natural vegetation will boost the occurrence of native tree and bush species. Native forest species hold fruits, such as fruits from Tara and Algarrobo and other valuable non-timber forest products, such as traditional medicinal plants, which can be commercialized by the farmers. For example, *muña muña* leaves are traditionally used in herbal tea against stomach ache and *wira*

wira is boiled with milk against colds or coughs. The project aims to deepen the knowledge of traditional fruits and medicinal plants to create awareness on the potential valorization of NTFPs.

The project will also provide trainings on apiculture practices. There is a high potential for bee keeping with *Apis Mellifera* in higher areas and *Apis Melipona* in lower areas. Apiculture provides different natural products: honey, propolis and pollen with a high economic valorization potential.



Photo 3.6.3: Illustration of beekeeping by Claudio Vasquez (the project coordinator),.

3.6.4 Coordinating and supporting the farmers in maintaining the agroforestry plots: woodland restoration areas on the slopes (including implementing water conservation activities, sustainably harvesting, and enrichment planting) to support natural regeneration and mixed fruit orchards to support a diversification in the farmer's livelihood..

The project will assist the natural regeneration of the endemic vegetation, through improved management and enrichment planting of endemic or naturalized species in woodland restoration areas and mixed fruit orchards. The woodland restoration areas are excluded from livestock and uncontrolled woodcutting. Natural regeneration is assisted by enrichment planting with endemic species; Pinus and Eucalyptus will not be planted in the project area. Enrichment planting is organized together with the community and smallholder farmers.

Tree seedlings are planted in November at the onset of the rain season. To plant the seedlings; first a soil opening of 30 by 30 cm is made; second this opening is filled with fertile substrate; third the seedling is planted in the middle. Application of this precise planting protocol is important to stimulate water trapping around the seedling.

The project will provide trainings and implement water conservation activities to trap runoff water. We will also revive the traditional Quechua technique to harvest rainwater in natural depressions, so called "Qucha chapay" in Quechua (or "Atajados" in Spanish). Such rainwater reservoirs exist in several versions and sizes. The small lagoons are waterproofed with clay or geomembranes to capture rainwater.



Figure 4: Example of “Qucha Chapay” in Peru (Asociación Bartolomé Aripaylla (ABA), <https://abaayacucho.org/>)

3.6.5 Complying with the Plan Vivo model to guarantee the overall sustainability of the project.

The project follows a milestone based monitoring scheme to follow-up soil carbon and biomass carbon in different plots, and regularly monitors soil and biomass carbon content in the project areas, along with monitoring of socio-economic conditions and biodiversity (see section 4).

3.7 Additionality

We completed Table 3.7 to provide a summary of the main barriers to project implementation and how they will be overcome for each project intervention. Full details of the additionality assessment, following an approved methodology, are provided in Annex 7.

Table 3.7 Additionality Assessment Summary

(Agro)forestry	Main Barriers	Activities to Overcome Barriers
Financial	The community and smallholder farmers face the following financial barriers: • Limited funds • Other shorter term priorities (e.g. crop production) • Limited private credit availabilities	Start-up capital secured; payment for socioenvironmental investments scheme supported by sales of Plan Vivo certificates
Technical	To date, technical knowledge on (agro)forestry and socioeconomic ecosystem service valuation is still limited. Thus, to strengthen the existing efforts, there is ample opportunity for projects focussing on the valuation of (socio-economic) ecosystem services and medicinal plants.	Skilled local coordinator (Claudio); training for local farmers; focus on (agro)forestry and (socio-economic) ecosystem service valuation.

Institutional/ Social	• “Top-down approach”, although the room is given for local initiatives. Such a top-down approach primarily originates from external institutions and regulatory bodies that prioritize standardization and compliance over local adaptation, its inflexibility is a barrier for initiatives that ensure farmer adoption.	• Bottom-up approach with first consultation round continued workshops and benefits for farmers • Rewarding for implementation results • Strengthening the capacities of the syndicates.
*Further additionality and spill-over effects of the project may include increased blue/green water availability for crops close or downstream to the project areas, erosion control, limited timber production and fruit production.		

3.8 Carbon Benefits

We refer to Annex 7 for a summary of the expected carbon benefits from each project intervention over the first project period and full details of our procedures for estimating carbon benefits, following an approved methodology.

Risk Management

3.9 Environmental and Social Safeguards

3.9.1 Exclusion List

The project does not include any activities listed in the Plan Vivo Exclusion List (see Annex 8).

3.9.2 Environmental and Social Screening

We completed Table 3.9.2 to provide a summary of the potential risks and impacts identified in the environmental and social risk screening. We refer to §3.9.3 for the environmental and social assessment and §3.9.4 for the environmental and social management planning.

The focal areas identified in the environmental and social risk screening are related with the issue of potential leakage from displaced degradation and conflict for resources.

We include the complete environmental and social screening report in Annex 9.

Table 3.9.2 Environmental and Social Risks

Risk Area	Likelihood (1-5)	Magnitude (1-5)	Significance (low, moderate, severe, high)
Vulnerable Groups	3	3	Moderate, potential risks mainly related with perpetuation of income-related inequality
Gender Equality	3	2	Moderate, potential risks mainly related with perpetuation of gender-related inequality

Human Rights	2	2	Low, potential risks mainly related with individuals not being present during community meetings
Community, Health, Safety & Security	3	3	Moderate, potential risks mainly related with social conflicts with food security disrupting land, water or market access.
Labour and Working Conditions	1	2	Low, as the project will at all times align with regional/national labour laws
Resource Efficiency, Pollution, Wastes, Chemicals and GHG emissions	1	3	Low, as no pollutants are used, and project GHG emissions are negligible
Access Restrictions and Livelihoods	3	3	Moderate, potential risks mainly related with displaced degradation due to access restrictions
Cultural Heritage	1	2	Low, since the project areas do not contain cultural heritage
Indigenous Peoples	1	3	Low, as the majority of all inhabitants in the project region are Quechua.
Biodiversity and Sustainable Use of Natural Resources	1	2	Low, no non-“native” trees are planted
Land Tenure Conflicts	3	3	Moderate, potential risks mainly related with displaced degradation
Risk of Not Accounting for Climate Change	1	3	Low, potential risks mainly related with droughts
Other – e.g. Cumulative Impacts	2	3	Moderate, potential risks mainly related with the potential leakage from displaced degradation

3.9.3 Environmental and Social Assessment

A community-level assessment of environmental and social risks has been held via community discussions and resulted in a community risk management plan, included in Annex 10.

3.9.4 Environmental and Social Management Plan

We completed Table 3.9.4 to describe the mitigation measures in place to address environmental and social risks and impacts.

Table 3.9.4 Environmental and Social Risk and Impact Mitigation Measures

Risk/Impact	Mitigation Measures	Key Project Activity
R1: Social and political risks: • The selection of target groups creates social bias. • Political opposition to the project	- To avoid social bias, the selection of target groups is based on continuous, comprehensive and participatory community consultations. - To avoid political opposition to the project, the project is in contact with Fonabosque (the national forest development institute	Strong community involvement and community meetings with the syndicates (Activity 1.1, 3.1)

	under the Ministry of Environment and Water) and other relevant authorities at regional, district and commune levels, in fulfilling the national reforestation program (PNFR 2016-2030). There are additional mitigation measures to counter the risk of gender imbalance (see further).	
R2:Economic risks: • Insufficient incentive to support project activities • Community support for the project is not maintained • External parties carry out activities that reverse climate benefits; rights to benefits are disputed	The project follows a bottom-up approach and will focus on non-timber forest products and agroforestry to create incentives for local populations to support ecosystem restoration. Subsequently, minimizing the risk of a lack of interest and safeguarding permanence. All project sites are legally protected by an agreement with the community or smallholder. The legal protection, as well as the project agreement, prohibits external parties to carry out activities that reverse climate benefits, while the project agreement discusses the procedure to handle disputes. The project provides regular trainings on (i) technical (agroforestry) issues; (ii) commercial (NTFP sales) issues; and (iii) methodological issues (Plan Vivo methodology, responsibilities). Because of the focus on non-timber forest products, switching to alternative land uses will be unattractive for the local community.	Strong community involvement, community trainings and benefit sharing (Activity 1.1, 3.2, 3.3)
R3: Environmental • Extreme weather: drought and floods • Pest and disease attacks • Fire	Impact of extreme weather events, such as drought and flooding, are alleviated through resilience building. To improve resilience to extreme weather, pests and diseases, seedling planting should involve a biodiverse mix of different native species. Biodiversity will be monitored (see monitoring section). To reduce risks of accidental fire, trainings on forest ecosystem services and fire preventions are hold at community meetings.	Installing water conservation structures, provide trainings, set up nurseries and enrichment planting (Activity 1.2, 1.3, 2.1, 2.2)
R4:Leakage of carbon benefits	The risk that the establishment of woodland restoration areas could lead to higher	Strong community involvement, provide

• Project leads to displaced grazing • Project activities fail to deliver expected benefits	livestock pressure on rangelands elsewhere in the village or in neighbouring villages is low (for details, see leakage section). To avoid these issues, the following measures will be taken: (i) The establishment of new woodland restoration areas must follow intensive interviews and discussions in the village, and can only be implemented if the community council agree on the design of a set of clear rules. (ii) To avoid increased grazing pressure elsewhere in the village when working with a newly established protection area, The project will encourage livestock stable feeding with fodder. Frequent trainings are organised to assure effective implementation of the project interventions.	trainings, monitoring and community meetings (Activity 1.1, 1.3, 2.3, 3.1)
R5: Administrative • Capacity of the project coordinator to support the project is not maintained • Technical capacity to implement project activities is not maintained	The project partnership builds on a strong local network, with several years of experience in sustainable forest management and agroforestry in the project areas. The project team has a good collaboration with the Berto Nicoli Institute of Technology, Fonabosque and CETM. The project aims to further expand its workforce during the course of the project.	Strong community involvement and trainings (Activity 1.3, 3.2)

3.9.5 Native Species

We completed Table 3.9.5 to identify any non-native tree species that will be planted or other non-native plant or animal species that will be introduced to the project. All used species are native, except for some naturalized fruit trees involved in the agroforestry intervention (source used: <https://powo.science.kew.org/>)

Table 3.9.5: Non-Native Species Overview

Project Intervention	Non-Native Species Planted/ Introduced	Justification	Risk Assessment and Management
Agroforestry	Apple (<i>Malus domestica</i>), peach (<i>Prunus persica</i>)	Commonly used fruit trees, popular in the project area and delivering important	Commonly used fruit trees, non-invasive and posing no environmental risk or threat. Planted in a

		non-timber forest products/fruits	diverse mix with native trees in agroforestry plots.
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3.10 Achievement of Carbon Benefits

The project will generate rPVCs (to be transformed to vPVCs after every verification cycle), so a 10% proportion of carbon benefits will be held as insurance against non-achievement of carbon benefits.

The carbon benefit achievement presents the carbon benefits after deduction of 20% by the Plan Vivo pooled buffer.

3.11 Reversal of Carbon Benefits

We completed Table 3.11 to describe the impact and likelihood of risks to the long-term maintenance of Carbon Benefits from the project. In the Score column, we multiplied Impact and Likelihood scores to give a total score between 0 and 9.

Table 3.11 Risk of Reversals

Risk Factor	Impact	Likelihood	Mitigation Measures* [§]	Score**
Social				
Land tenure and/or rights to climate benefits are disputed	2: Climate benefits would not be issued for affected project area, but the project geographical spread across different project areas would limit the total impact	2: Tenure is secured, and agreements and contracts are in place	Project agreements agreed and signed by relevant stakeholders	4
Political or social instability	2: Instability would impact administrative capacities of the project coordinator (see Administrative)	2: There have been several political changes, but Bolivia has known no civil wars since the national revolution	To work in good collaboration with Fonabosque, and other relevant authorities at municipality levels.	4
Community support for the project is not maintained	3: Potential impact would be important, although our project areas explicitly exclude fertile agricultural fields.	1: The project is community-driven and communities receive payments for socioenvironmental investments	The project provides extra trainings on (i) technical (forestry) issues; (ii) commercial (NTPF/apiculture) issues; and (iii) methodological issues (Plan Vivo methodology, responsibilities).	3

Economic				
Insufficient finance secured to support project activities	3: There would be insufficient incentive to support project activities, although that situation would only be temporary	1: The project coordinators are well-established organisations, capable to provide funding for investments	Financial plan developed, see §5.5 and annex 16	3
Alternative land uses become more attractive to the local community	2: Climate benefits would not be issued for affected project area, but the project geographical spread across different project areas would limit the total impact	1: Secured socioenvironmental investments for the project participants via the 60% carbon benefit share	Project agreements agreed and signed by relevant stakeholders; designated grazing areas; agroforestry plots providing wood and fruits	2
External parties carry out activities that reverse climate benefits	2: Climate benefits would not be issued for affected project area, but the project geographical spread across different project areas would limit the total impact	2: Tenure is secured, and agreements and contracts are in place	The project agreement prohibits external parties to carry out activities that reverse climate benefits, while the project agreement discusses the procedure to handle disputes.	4
Environmental				
Fire	2: After an unexpected environmental shock, the affected project areas will receive extra project attention and enrichment planting.	2: Community stewardship and responsibilities via among others signed Project agreements are in place	Training sessions and sensibilisation meetings are organised for all communities; community members help in protection.	4
Pest and disease attacks	2: After an unexpected environmental shock, the affected project areas will receive extra project attention and enrichment planting.	1: Seedling planting involves a biodiverse mix of different endemic species (see §3.9.5)	Training and awareness on the importance of a biodiverse mix of native species and Biodiversity monitoring (see monitoring section).	2

Extreme weather or geological events	2: After an unexpected environmental shock, the affected project areas will receive extra project attention and enrichment planting.	2: Drought may occur in some years although the coordinators and communities are experienced and adapted to this	The occurrence of environmental shocks is included in the monitoring targets to ensure strict follow-up	4
Administrative				
Capacity of the project coordinator to support the project is not maintained	3: Potential impact would be important but the communities could take over some responsibilities	1: The project coordinators are well-established organisations, capable to provide socioenvironmental support	Financial plan developed	3
Technical capacity to implement project activities is not maintained	3: Potential impact would be important but the communities could take over some responsibilities	1: The project coordinators are well-established organisations, capable to provide socioenvironmental support	Financial plan developed, technical specifications developed	3

* Generally applicable for Activities 1.1 to 3.3

** If the score is greater than 4 for any risk factor (quod non), additional mitigation measures are required to reduce the risk to an acceptable level.

[§] See Annex 10 with more details on the participatory designed risk mitigation plan

3.12 Leakage

We describe the risk of leakage (outside the project areas), the estimation and monitoring of leakage and leakage mitigation measures in Annex 7 (leakage sections), based on the approved PU004 methodology.

Table 3.12 Leakage Risk Mitigation

Project Intervention	Leakage Risk	Mitigation Measures
Agroforestry: home orchard establishment and woodland restoration	Displaced grazing, See annex 7*	Displacement to zero-grazing systems and existing grazing lands without exceeding the carrying capacity, See Annex 7, Activity 1.1-3.3

* Based on AR-TOOL15 version 2.0 to estimate leakage significance: A/R Methodological tool – Estimation of the increase in GHG emissions attributable to displacement of pre-project agricultural activities in A/R CDM project activity (see Annex 7 - Leakage).

3.13 Double Counting

There are no carbon sequestration projects, programmes or initiatives that overlap with the project areas or that would generate transferable ecosystem services in the project area.

There is a certified Plan Vivo project, the Arbolivia project, that operates in the tropical lowlands of Cochabamba. We are working in geographically distinct regions. The Arbolivia project is located in the lowlands and the Bolitrees project is located in the Interandean valleys. We keep good contacts to exchange experiences on the ground and to safeguard not to overlap the project areas.

The carbon benefits achieved by the project will not be included in any other form of greenhouse gas emissions trading. The project is registered by the Plurinational State of Bolivia (APMT-MC-CR-01/2025).

In every annual report, the project will check emerging regulations that relate to environmental services and carbon credit framework in Bolivia and state how compliance will be organized (if applicable).

Table 3.13 GHG Emission Reduction and Removal Projects and Programmes in the Project Region

Project, Programme or Initiative	Scope	Carbon Credit Generation	Risk Mitigation
No GHG emission reduction/removal project programmes or initiatives overlap with the project region (note that this project received one of the first registration certificates in the country: APMT-MC—CR-01/2025)	-	-	-

Agreements

3.14 Land Management Plans

For every site, community plan vivo maps were designed during community meetings. These plan vivos are handwritten spatial land management plans, voluntarily produced and owned by the community or community sub-group.

During the establishment of 'plan vivos', members of the project team were present and provided logistical support (paper, pens) but they never steer the 'plan vivo' development. The members of the community council should have full freedom to add any element they prefer on the 'plan vivos'. The members develop a map of the present situation, and a map of the desired situation. Maps are developed in Quechua or Spanish.

After mapping, the local coordinator assesses the cartographic quality of the plan vivos (correct area delimitation, legend) and possibly invites the participating members to make cartographic corrections. The plan vivos are stored in the office in Cochabamba, and scans are stored on a separate drive. Examples are presented in Annex 11.

Thus, these plan vivos are handwritten spatial land management plans, voluntarily produced and owned by the community, which are included in the project agreement. This voluntary and

participatory mapping/planning process addressed the following local socio-ecological needs and priorities:

- Water shortage and sustainable water management
- Local livelihood needs and opportunities to improve existing or diversify livelihoods and incomes such as agroforestry plots and apiculture products
- Reduce pressure on the natural ecosystem
- Reduce loss of fertile soils by erosion
- Opportunities to enhance biodiversity through the use of native species
- Practical and resource implications for participation of women

We provide example land management plans in Annex 11.

3.15 Crediting Period

The initial crediting period is from February 2024 to February 2059 (35 years period), which may be extended for project areas that were added to the project after 2023. After the crediting period, the project will keep monitoring the project for another 15 years, bringing the total project period to 50 years.

3.16 Benefit Sharing Mechanism

Payments are linked directly to the implementation of woodland restoration and agroforestry project activities by smallholders or community groups, in line with the future plan of the area as developed by the smallholders or communities themselves.

Net revenue generated by the sale of PVCs will be divided as follows: 40% will go to program operations and development whereas the remaining 60% will go directly to the local stakeholders (via the milestone based scheme).

The agroforestry monitoring indicators form the basis of the results-based system and disbursement mechanism. Payments are made to smallholder or community producers according to predetermined milestones (see Annex 7). Successful evaluation is determined by a combination of on the ground technician judgement and in-office data analysis. If both the technicians and the data suggest that the producer has met the target, full payment is received. If the target has not been met but the threshold is achieved, partial payment is made and corrective actions are implemented. If the threshold is not met, payments are withheld until targets are reached the following year. Farmers are suspended from the project if they leave before the end of their monitoring period or miss two yearly targets in a row. It is then assumed that all trees have been cut.

From the 60% partim smallholder farmers or community groups receive, one sixth of each payment (or 10% of the total budget) is shared with the community to support community and nursery reinvestments.

All contracts are overseen by the project coordinators, who guarantee that at least 60% of the project budget will directly benefit project participants and other local stakeholders. The annual disbursements are transparently reported in the annual reports.

3.17 Grievance Mechanism

Complaints and suggestions that are raised during community meetings, satisfaction surveys or walks around the project areas are recorded by the project coordinator in a “complaints and suggestions logbook”. This logbook is stored together with the “libro de actas” of the community, which holds the meeting agreements of all community meetings and acts as the community secretariat. The sub-Alcaldia and Alcaldia act as arbitrator to handle community disputes that cannot be resolved amicably.

The logbook is regularly updated and scans are stored on the shared drive. Where possible, remediating actions – following complaints and suggestions – are taken. The project coordinator is responsible to organise consultation rounds (if required by a community council) and remediation actions. We refer to the grievance flowchart in annex 17 for actions in case of grievance.

3.18 Project Agreements

If a community may want to enter into a project agreement, several initial community meetings are organised (see §2.4), to discuss on basic project logic and get initial feedback. Thereafter, the process of establishing plan vivos can start. Only then, a project agreement can be signed with the interested smallholders or community groups.

Project agreements do not remove, diminish or threaten project participant’s rights to land and/or resources. The agreements are validated by the Syndicates and valid for 50 years.

We refer to Annex 12 for example project agreements with smallholders or community groups, showing all details, the process for entering into project agreements following FPIC principles, the expected annual sequestration rate, details on grievance mechanism, double counting, and measures in place to ensure that project agreements do not remove, diminish or threaten project participant’s rights to land and/or resources.

The project agreements are translated in Spanish for the project participants.

4 Monitoring and Reporting

Indicators

4.1 Progress Indicators

We completed Table 4.1, providing SMART indicators and means of verification for the project outputs and activities included in the project logic (Table 3.5).

Table 4.1 Progress Indicators

Output/Activity	Indicator	Means of Verification	Result on non-progress indicators
Output 1 Community or smallholder lands are undergoing	P1: Project lands undergoing agroforestry activities , as	Legal agreement declaring the status of protection for 50 years	C1 (seedlings), C2 (survival

protection via agroforestry activities such as home orchard establishment and woodland restoration.	share of 1000 ha from 2023 onwards (area in hectare).		rate), C3 (disturbance), C4 (biomass), E2(Species Richness)
Activity 1.1 Strong involvement of community members in the project management, defined in community and smallholder project agreements. The restoration project areas are protected by community members.	P2: % of community members having a project agreement for agroforestry activities and having established grazing monitoring systems.	Community and smallholder agreements on protection and grazing monitoring.	C3 (disturbance), E2 (Species Richness)
Activity 1.2 Installing water conservation structures, to trap runoff water.	P3: Number of water conservation structures installed or maintained per community	Reporting of water conservation activities; photographic evidence in Annual Report	C2 (survival rate)
Activity 1.3 Provide trainings on sustainable forest and water management.	P4: Organization of minimally 1 training on forest, apiculture or livelihood per community per year	Report and photographic evidence of trainings in Annual Report , Attendance list	C1 (seedlings), C4 (biomass)
Output 2 Increase in indigenous vegetation cover as a result of enrichment planting and conservation efforts.	P5: Annual evaluation of number of observations of grazing and logging in and around the project area	Reports of observation of indigenous vegetation cover and grazing and logging in and around the project area	C1 (seedlings), E2 (Species Richness), E3 (fire)
Activity 2.1 Establishing new nurseries provides indigenous tree seedlings for forest planting in project areas.	P6: Number of nurseries operating and delivering tree seedlings for enrichment planting per year	Annual tree seedlings produced, photographic evidence	C1 (seedlings), E1 (AGB), E2 (Species Richness), E3 (fire)
Activity 2.2 Enrichment planting with up to 600 endemic trees per hectare to accelerate ecosystem restoration	P7: up to 600 tree seedlings planted, sown or regenerated per hectare in the enrichment woodland restoration planting areas	Amount of tree seedlings planted per hectare	C1 (seedlings)
Activity 2.3 Monitoring progress (survival rate, biomass, , biodiversity)	P8: Number of survival counts and surveys per year in line with the milestone-based monitoring plan	Monitoring reports	C4 (biomass), E2 (Species Richness)

in line with the monitoring plan			
Output 3 The community members are implementing the socioenvironmental changes they envisaged.	P9: Milestone-based socioenvironmental payments and investments made in the project area (in bol/dollar)	Reports and contracts of socioenvironmental investments, photographic evidence	L3 (benefit sharing)
Activity 3.1 Pre-project and annual community meetings with the agrarian syndicates of the different project areas.	P10: Organization of minimally 1 community meeting per year with minimum 30% female participation	Report of community meetings, photographic evidence	L2 (trainings), L1 (female participation)
Activity 3.2 Providing annual trainings in agroforestry, apiculture and other non-timber forest products (such as medicinal herbs).	P4: Organization of minimally 1 training on forest, apiculture or livelihood per community per year	Amount of trainings organized Training reports and photographic evidence	L2 (trainings), L1 (female participation), L4 (Income)
Activity 3.3 Creating community benefits through socioenvironmental investments	P9: Annual socioenvironmental payments and investments made in the project area (in bol/dollar)	Reports and contracts of socioenvironmental investments, photographic evidence	L3 (benefit sharing)

4.2 Carbon Indicators

We completed Table 4.2 to provide a summary of the carbon indicators that will be monitored for each project intervention. Full details of each carbon indicator have been included in Annex 7.

Project Intervention	Carbon Indicator	Means of Verification
Agroforestry: fruit orchard establishment and woodland restoration	C1: Number of seedlings planted across the enrichment planting areas	Registration of tree seedlings leaving the nurseries for enrichment planting across the agroforestry areas, photographs of planting activities and GPS data.
	C2: Survival rate of seedlings planted in the project areas	Monitoring of survival rate of seedlings planted, 6 months after planting.

	C3: Annual observations of disturbances (grazing or logging) in the project zones	Registration of observations made by project staff and/or mentioned during the yearly community meeting
	C4: Above Ground Biomass conditions at milestones in the monitoring plots	Milestone-based monitoring scheme for each project plot (see techspec).

4.3 Livelihood Indicators

We completed Table 4.3 to describe the indicators that will be used to monitor the livelihood status of project participants and other local stakeholders, and risks of negative social impacts.

Livelihood Indicator	Means of Verification
L1: % female participation during the annual community meetings per project area	Reporting and photographic evidence in Annual Report
L2: Organised trainings on agroforestry	Reporting and photographic evidence of trainings in Annual Report
L3: Socioenvironmental payments and investments in the project areas	Financial reporting included in Annual Report
L4: Annual cash income of apiculture associations when included in the project	Financial statements of apiculture associations

4.4 Ecosystem Indicators

We completed Table 4.4 to describe the indicators that will be used to monitor ecological conditions risks of negative environmental impacts in the project region.

Monitoring of indicators is carried out by M'iski Kausay.

Ecosystem Indicator	Means of Verification
E1: Average Above Ground Biomass conditions across woodland restoration areas	Systematic vegetation monitoring in nested plots (see Annex 7 for all details)
E2: Species Richness in the project areas	Based on the vegetation survey, the total number of species in the community (richness S), as well as the proportion of species i relative to the total number of species (p_i) can be calculated. We use the Shannon's diversity or evenness index as a robust indicator for biodiversity status in the project areas. The evolution of the Shannon index will be reported every 5 years.
E3: Number of observations of fire and agriculture expansions in and around the project zones	Registration of observations made by project staff and/or mentioned during the yearly community meetings

Monitoring

4.5 Monitoring Plan

Overall, annual progress reports will present activity-based indicators to determine whether the project activities are being carried out as needed to achieve the expected benefits.

In parallel, milestone-based biomass monitoring and 5 years (at minimum) full-scale monitoring rounds will be organised to transfer towards vPVCs with verifications. The 5 years monitoring round includes livelihood and ecosystem monitoring from representative samples.

We refer to the monitoring plan, flowchart and indicators in Annex 13 (a,b,c) for more details on specific monitoring and verification activities.

4.6 Progress Monitoring

The annual milestones or targets of the progress indicators are listed in table 4.6. The targets are subdivided in three categories: full, partial and missed target.

There are the following consequences for certificate issuance and corrective actions that will be implemented if the yearly performance targets are not met (mitigation actions):

- (i) If the values for all indicators meet or exceed their performance target, the full issuance is received;
- (ii) If one or more of the indicator values are below its performance target for one monitoring period, the full issuance is received but corrective actions must be implemented;
- (iii) If one or more of the indicator values are partially achieved for two consecutive monitoring periods, the full issuance is received but corrective actions must be implemented.
- (iv) If one or more of the indicator values are missed for two consecutive monitoring periods or partially achieved for three consecutive monitoring periods, certificate issuance is withheld until corrective actions have been implemented and the performance target(s) have been reached.

Table 4.6 Progress monitoring

Project interventions	Progress Indicator	Annual milestone or target		
		Full Target Achievement	Partial Target Achievement	Missed Target
Agroforestry: home orchards and woodland restoration	P1: Project area undergoing active agroforestry activities	>=50% of active project plots	-	<50%
	P2: % of community members having a project agreement for agroforestry activities and established grazing monitoring systems.	100%	-	<100%
	P7: Tree seedlings planted, sown or regenerated per hectare across the	Up to 600 per hectare	Between 80–160 regenerates per hectare	<80 regenerates per hectare

	enrichment woodland restoration planting areas		since baseline measurements	since baseline measurement
	P8: Survival rate of tree seedlings after 6 months and at milestones	$\geq 70\%$	Between 40% and 70%	$< 40\%$
	P6: Nurseries operating and delivering minimally 5000 native (or naturalised) seedlings	≥ 5000 seedlings	Between 5000 and 1000 seedlings	< 1000 seedlings
	P3: Establishment or maintenance of one water harvesting structure per community	≥ 1	-	0
	P4: Organization of minimally 1 training on forest, apiculture or livelihood per community per year	≥ 1	-	0
	P5: Observations of disturbances (%) (grazing, logging or fire) in the project area	$< 20\%$	Between 20% and 30%	$> 30\%$
	P10: Female participation to annual community meetings	$\geq 30\%$	Between 20 and 30%	$< 20\%$
	P9: Milestone-based socioenvironmental payments and investments made in the project area (bol/dollar)	60%	Between 40 and 60%	$< 40\%$

4.7 Carbon Monitoring

The carbon monitoring scheme follows a triple track:

- At annual pace, the carbon project indicators are monitored throughout the project period. This allows to follow-up on the activity based indicators underpinning the carbon estimation as described in Annex 7.
- At milestone based pace, biomass monitoring rounds are organized to monitor tree growth in the agroforestry plots. If one or more of the indicator values is below its target for one monitoring period, payment is withheld until corrective actions have been implemented and the target(s) are reached (see Annex 7).
- At a 5-year pace, carbon project verification rounds are organized. This allows verification of estimated carbon sequestration and calibration of the carbon model to fit the measured carbon

sequestration rates based on field measurements and when applicable update the PDD consequently. If the project expands, the frequency of verifications could be accelerated in the future.

4.8 Livelihood and Ecosystem Monitoring

4.8.1 Livelihood Monitoring

For each of the livelihood indicators listed in Section 4.3, we identified targets for each period of 5-years throughout the project period.

Livelihood Indicator (section 4.3)	5-year target
% female participation during the annual community meetings per project area	Minimally 30%, striving towards 50%
Organised trainings on agroforestry activities	1 training per community per year
Socioenvironmental payments and investments in the project areas and % increase in annual household income	See Project Agreement Increase $p < 0.05$ (ceteris paribus)
Establishment of apiculture associations	Striving towards 1 apiculture association per project area

4.8.2 Ecosystem Monitoring

For each of the ecosystem indicators listed in Section 4.4, we identified targets for each period of 5-years (or less) throughout the project period.

Ecosystem indicators (section 4.3)	5-year target
Average Above Ground Biomass conditions across woodland restoration areas	Statistical significant increase in Above Ground Biomass in the woodland restoration areas in line with Annex 7 - techspec
Species Richness in the project areas	2% increase of plant-species richness, based on the Shannon diversity or evenness index.
Number of observations of fire and agriculture expansions in and around the project zones	Continued reduction of woodcutting and agricultural expansion.

4.8.3 Sharing Monitoring Results

Ecosystem and livelihood monitoring results are discussed directly with all local stakeholders involved to the project during the community meetings. This allows for direct feedback from the community members to adjust the project design if issues arise.

Parallel to this, the project will disseminate monitoring results to the broader society by setting-up joint workshops with local government partners (e.g. Fonabosque) and associations (e.g. CETM) to inspire communities outside the project areas.

In addition, monitoring results will be shared in Annual Reports and Verification Reports, transparently published on the Plan Vivo website.

Reporting

4.9 Annual Report

The project annual cycle runs, with a start in February. The baseline measurements and environmental activities began in 2024. Annual reports will be submitted in February of the following year.

Monitoring of the project milestones will be organised as stipulated in the project agreement.

4.10 Record Keeping

All project data are stored on a shared project drive with limited access (Google Drive). The project data (technical data, financial data, monitoring data) are updated on the drive at least once per month.

In Annex 14, an overview of the general database architecture is included. Note that this a dynamic environment, subjected to changes over time.

00_PrePin
01_PIN
02_PDD
03_Validation
04_AnnualReport
05_Verification
06_ProjectManagement
07_ReferencePapers
08_FieldVisit
09_MeetingNotes
10_ProjectFunds

5 Governance and Administration

5.1 Governance Structure

The project is a Bolivian-Belgian partnership aiming to promote agroforestry activities and non-timber forest production in the inter-Andes valleys of Bolivia, by supporting smallholder farmer communities. The project is a joint partnership between Misk'i Kausay and Climate Lab; both organisations signed a partnership agreement.

Climate Lab will act as the Plan Vivo 'project coordinator' with the overall responsibility. Climate Lab will thus be responsible for the registration and recording of 'plan vivos' and sale agreements; will manage the use of project finance in the Plan Vivo and make payments to producers; will coordinate and record monitoring; will report to the Plan Vivo Foundation and will contract project validation and verification. Climate Lab will provide technical support in and out of the field, evaluate plan vivos and monitor plan vivos.

Misk'i Kausay is a legal Bolivian association with years of experience in ecosystem restoration, agroforestry and apiculture, located in Cochabamba. Misk'i Kausay aims at using the local expertise to guide local communities in their shift towards sustainable agroecological practices.

The proposed project governance structure is schematized in Figure 3. The project "Quechua medicinal herbs and (agro)forestry in the central Bolivian Andes" is locally fostered by Misk'i Kausay, along with interested farmers from the Agrarian Syndicates, in close cooperation with local authorities and associations.

The agrarian syndicates (community representatives) are responsible for working with the Project team to ensure legitimate decision-making, equitable participation in implementation and benefit sharing in the project activities. Each syndicate will oversee the agroecological activities in the project areas. Each Syndicate will meet at least monthly to discuss matters related to the project.

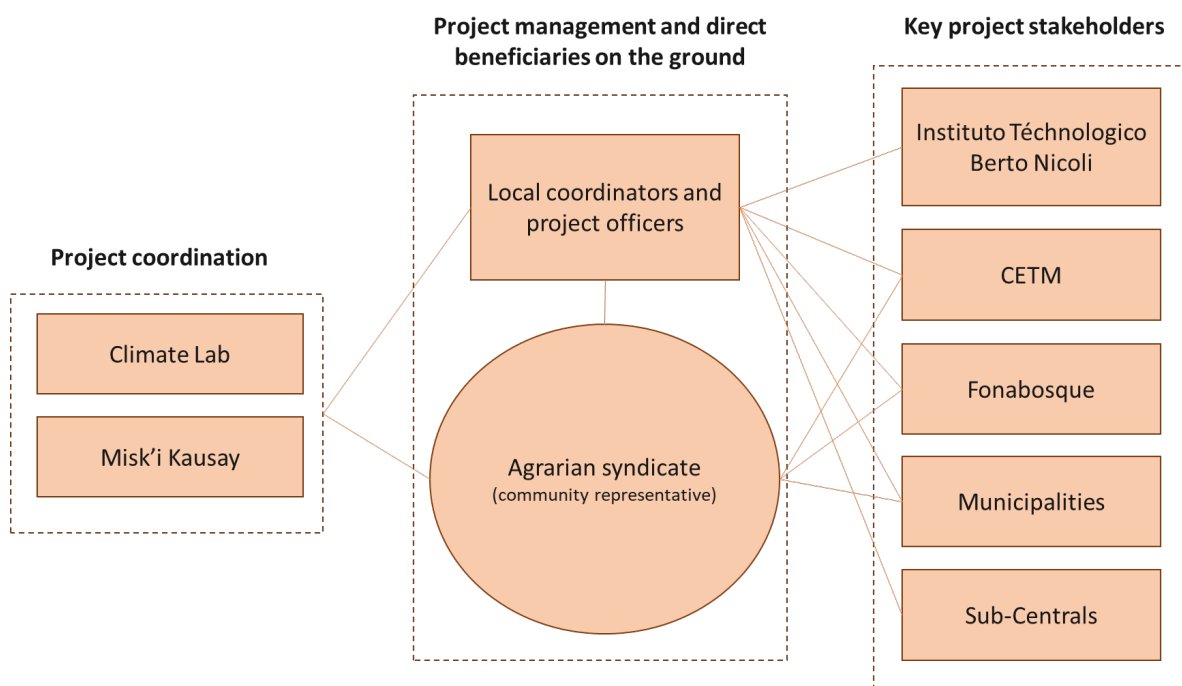


Figure 5.1: Schematized summary of the governance structure of the project

5.2 Equal Opportunities

The project partners signed an ethical charter not to discriminate based on gender, age, ethnicity, religion or social status when selecting project participants (§2.3). The ethical charter "Carta Etica" is included in Annex 2."

Besides, as explained in §2, stakeholder participation is embedded in the design phase consultations of the project using community meetings and is maintained throughout the project lifetime. The project has partnered with CETM to actively encourage participation of women in all meetings and strive towards equal participation, with an absolute minimum of 30% female participation

5.3 Legal and Regulatory Compliance

The Plurinational Authority of Mother Earth (APMT), constituted in Law 300: Art. 53, as a strategic and self-governing public law entity with autonomy of administrative, technical, and economic management, under the guardianship of the Ministry of Environment and Water, granted the project a formal Certificate of Registration (Annex 15) with registration number No. APMT – MC – CR – 01/2025. By means of the Technical Report APMT/DMC/INF/00083/25, the Registration of the project proceeded before the APMT, through the Directorate of the Joint Mechanism of Mitigation and Adaptation for the integral and sustainable management of forests and Mother Earth, within the framework of the Regulation for Registration and Adscription of Initiatives, Projects, and Programs in Climate Change, and was formally approved by the APMT on 28/04/2025.

The legal framework for Article 6 trading is to be finalised in the near future, and the BoliTrees project will follow the requirements in the legal framework very closely. The project will comply with all the legal requirements.

We complete Table 5.3 with national and international policies, laws and regulations that may affect the project, and demonstrate that the project will operate in full compliance with these.

The environmental licenses from the relevant authorities – that approve the project activities – are included in Annex 15.

Table 5.3: Legal and Regulatory Compliance

Policy, Law or Regulation	Date	Relevance	Compliance Measures
RM 067/2025	16/05/2025	Evaluación de Programas de Financiamiento Climático: Establishes the official criteria and process for evaluating and prioritizing projects. This ensures projects align with Bolivia's national climate goals (NDCs) and deliver required social and environmental co-benefits.	Project registration (APMT-MC-CR-01/2025), See Annex 15
RM 066/2025	14/03/2025	Registro Nacional Obligatorio (RENAPP): Creates the mandatory state registry for all carbon projects, ensuring traceability of Emission Reduction Units (UREs) and preventing double counting—a fundamental requirement for market integrity.	
The Mother Earth Law and Integral Development to Live Well, Law No 300	15/10/2012	The Mother Earth Law is a piece of legislation that epitomises Bolivia's dedication to sustainable development, respecting the balance between human life and the natural environment, and prioritising the rights and knowledge of the country's majority indigenous population. The expressed objective of the law is to 'establish the vision and fundamentals of integral development in harmony and balance with Mother Earth to Live Well, guaranteeing the continued capacity of Mother Earth to regenerate natural systems, recuperating and strengthening local and ancestral practices, within the framework of rights, obligations and responsibilities'. In relation to climate change the law has many provisions that outline the state's vision, citizens' rights, and responsibilities. It embraces the concept of 'climate justice', defined by the ability of all Bolivian citizens to 'Live Well', especially those who are most vulnerable to climate change. It reinforces the point that some states have more of a global responsibility to respond to climate change.	
The Rights of Mother Earth Law n. 071/2010	01/12/2010	This law is a general framework that preceding the more comprehensive 2012 Mother Earth Law. This law's single objective is to recognize Mother Earth as a political subject enshrined with the following rights: life, biodiversity, water, clean air, equilibrium, restoration, and life free from contamination. The law stipulates the obligations of the government to protect the rights of Mother Earth as well as the responsibilities of all citizens.	
Forest Law No. 1700	12/09/1996	The law updates the legal framework, shoring up the federal state's authority to regulate the forestry industry and economic land use. The objective listed in the law's text is to establish legal norms for the sustainable use and protection of national forests, harmonising social, economic and ecological interests for present and future generations. This is an early legislative action to combat desertification in Bolivia, mitigate the negative effects of GHG emissions through the conservation of tropical forests, and preserve the natural environment for future generations. While climate change was one driver for this law, explicit mention of climate change is marginal to the logic of conservation; and the Law of Mother Earth (listed above as the national flagship legislation) now occupies the main role in incorporating mitigation and adaptation strategies to forestry management.	
Supreme Decree no 071/2009	09/04/2009	The Supreme Decree no 071/2009, signed by the Bolivian President, creates a number of authorities in the environmental area, establishes	

		new regulatory processes in the field and changes the name of the General Superintendence of Mines and the Regional Superintendencies of Mines. Chapter III, art. 30, on the attributions of the Minister of Rural Development and Land, charges the Minister in its first paragraph of the renewable natural resources in forestry and agrarian matters. Art. 31 on the attributions of the Authority for the Control and Social Control of Forests and Land, notably charges the Authority to 1) ensure the integral and sustainable management of forest resources and land in application of the current legal regulations, by local populations, communities and native indigenous peoples, Community Forestry Organizations, as well as private actors; to 2) grant the permits for the use and exploitation of forest resources according to the capacity of land use, for forestry, agricultural, agroforestry, research and conservation activities, through suitable instruments to be developed; and to 3) promote and participate in the development of the National Forest and Land Inventory, in order to facilitate access to the sustainable use of renewable natural resources.	
Supreme Decree No. 25.558 creating the Interinstitutional Council for Climate Change	22/10/1999	This Decree creates the Inter-institutional Council for Climate Change (CICC), as an instance of dialogue and consultation of the social, governmental and non-governmental sectors, related to climate change. It is the responsibility of the CICC to deliberate and propose - national policies and strategies for the implementation of the United Nations Framework Convention on Climate Change.	
Supreme Decree No. 2.914 on Deforestation monitoring and control	27/09/2016	This Decree creates the Program for Monitoring and Control of Deforestation and Degradation of Forests 'Our Forests'. It establishes its components and the mechanisms for its execution, according to the Economic and Social Development Plan within the framework of Integral Development to Live Well 2016-2020 and in compliance with international commitments on climate change.	
Supreme Decree No. 2.342 on Risk Management	29/04/2015	This Supreme Decree regulates the Risk Management Law No. 602 of 2014, which introduced the institutional framework and the rules that govern risk management. This rules include prevention, mitigation and recovery, and disaster or emergency care through preparation, alert, response and rehabilitation against disaster risks caused by natural, socionatural, technological and anthropic threats, as well as social, economic, physical and environmental vulnerabilities.	
Supreme Decree No. 942 regulating the Universal Agrarian Insurance Pachamama	02/08/2011	This Decree contains the regulation of the Universal Agricultural Insurance "Pachamama", through the implementation of the Agricultural Insurance for Municipalities with higher levels of Extreme Poverty (SAMEP). The "Pachamama" Universal Agrarian Insurance insures the agricultural production affected by damages caused by climatic phenomena and adverse natural disasters. The Decree also establishes the nature and institutional financing, the role and powers of the highest executive authority of the Agrarian Insurance Institute. The Ministry of Rural Development and Land, in coordination with the Ministry of Development Planning are the entities responsible for identifying the municipalities with high levels of poverty.	
Constitution of Bolivia (Spanish: Constitución Política del Estado)	07/02/2009	The Constitution of Bolivia was adopted in 2009. This Constitution was drafted in accordance with the then President, Evo Morales', political campaign promise to convene a new constituent assembly. In 2007, the assembly established the year before had prepared a draft of the current Constitution. Following the Constitutional Referendum of 2009, through which 61.43% out of over 3.5 million voters approved the project, the Constitution of Bolivia came into effect. The Constitution establishes that Bolivia is composed as a Unitary Social State of Pluri-National Communitarian Law (Estado Unitario Social de Derecho Plurinacional Comunitario) that is free, independent, sovereign, democratic, inter-cultural, decentralized and with autonomies. In the Constitution's preamble, there is a reference to the "strength of Pachamama", Mother Nature. Moreover, it includes in its main text a	

		provision specific to climate change. Article 407 of the Constitution states that rural development policy objectives include protecting agricultural and agro-industrial production from climate-related risks, as follows: "Article 407. The objectives of the policy of the State for comprehensive rural development, in coordination with the autonomous and decentralized territorial entities, are the following: [...] 4.To protect agricultural and agro-industrial production from natural disasters and inclement climate, and geological catastrophes. The law shall provide for the creation of agricultural insurance. [...]".	
Economic and Social Development Plan - PDES 2021-2025	25/12/2021	This document sets the government's development vision over the period 2021-2025. Under its 8th goal, the plan aims to: 8.1. Strengthen the comprehensive and sustainable management of forests as a strategic resource, promoting the protection of areas with a forestry vocation. 8.2.Promote mitigation, adaptation and monitoring actions for climate change, with effective response measures to its impacts in harmony and balance with mother earth. 8.3.Promote life systems with a healthy, protected and balanced environment in harmony with Mother Earth. 8.4. Promote the system of protected areas, wetlands, bofedales, as part of the country's -natural heritage. 8.5. Strengthen the integrated management of surface and groundwater resources to achieve water security. The plan also seeks to guarantee food security and sovereignty, with a specific focus on indigenous populations. It promotes productive capacities and potentialities, under comprehensive management of basins (water), air, soil, forest resources, flora, fauna, risk management and adaptation to climate change based on the formulation of a Plan with a Comprehensive Management approach of their Territories. The plan further calls for an increase in renewable energy capacity.	
Supreme Decree 2912 on the National Forestry Program and reforestation and its implementing strategy	27/09/2016	The purpose of this Supreme Decree is to declare the National Afforestation and Reforestation Program - PNFR as a strategic and national priority within the framework of the Economic and Social Development Plan, and to approve the National Implementation Strategy of the PNFR 2016-2030. The implementing strategy is attached to the text of the decree as an annex. Article 4 states that the National Implementation Strategy of the PNFR 2016-2030, applies to afforestation and reforestation activities throughout the territory of the Plurinational State of Bolivia, which includes protection, commercial, agro-silvo-pastoral and urban forestry plantations. The National Strategy for the Implementation of the PNFR 2016-2030 establishes the execution mechanisms of the PNFR, which will be mandatory for the central level of the State and for the autonomous territorial entities and will govern the actions to be developed by the other actors considered in this Supreme Decree.	
Law No. 602 of Risks Management	14/11/2014	This law creates a national framework for disaster prevention and resilience as well as protocols for responding to disasters. It incorporates a climate change perspective by including measures that aim to adapt to changing climate conditions. The law creates the National Advisory for the Reduction of Risks and Attention to Disasters, which will include the national as well as provincial and municipal governments. The board allows for regional governments to declare a state of emergency without a federal decree. It further decentralizes responsibility to local governments to implement resiliency plans in preparation for climate and natural disasters before they occur. The law creates an initial fund of 0.15% of the national budget, amounting to BOB80m (USD11.6m) to fund humanitarian aid during aftermath of natural disasters.	

5.4 Financial Plan

In Annex 16, we provide a detailed financial plan.

5.5 Financial Management

The annual socioenvironmental investments will be transparently reported in the annual reports. The responsible accountant is Vandelanotte, an approved legal entity by the Professional Institute for Tax Advisors and Accountants (ITAA) with number 50792735. Climate Lab invested in the project start-up with internal funds, from 2026 onwards the project will finance its activities from the sales of carbon credits.

Vandelanotte performs an annual financial audit and submits the annual accounts to the Belgian national bank.

A. Annexes

1. Annex 1 – Project Boundaries

See digital shapefiles of project area boundaries attached.

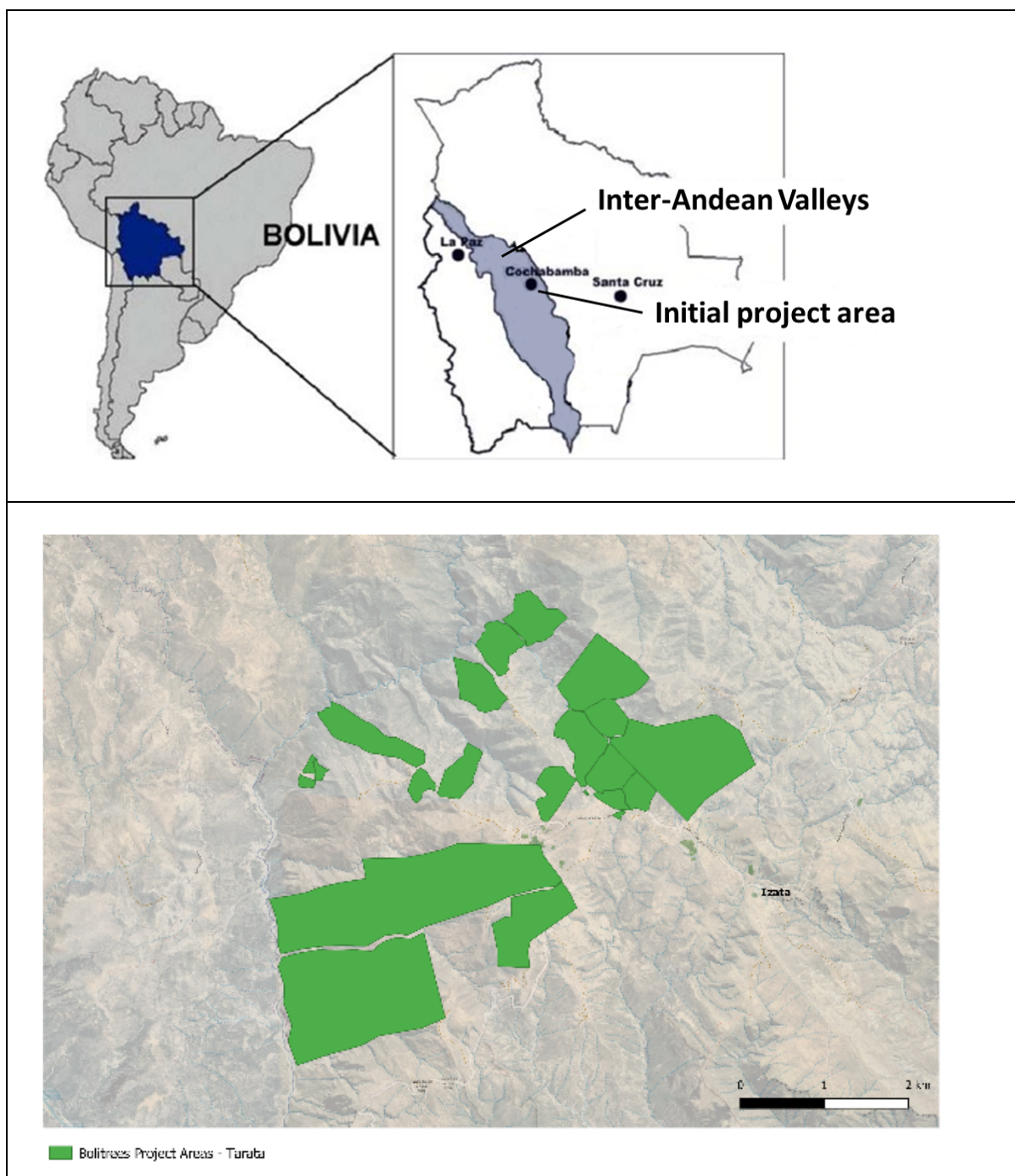


Fig A1.1: Project region and initial project area (regional map adjusted from Kessler, C. A. "Decisive key-factors influencing farm households' soil and water conservation investments." Applied Geography 26.1 (2006): 40-60).

2. Annex 2 –Registration Certificate and Partner Agreements

See copy of the project coordinator's registration certificate and signed agreement.

3. Annex 3 – Initial Project Areas

See table below

Initial Project Area	Tarata
Name of project participant	Syndicate
Location	Community of Tarata, see Annex 1
Project Intervention	Agroforestry: home orchards and woodland restoration
Extent of project area	350ha *
Project Agreement Reference	1
Start date	2024
Project Requirements 2.3.1 and 2.3.2 met?	Yes

*current participating shareholder land patches allocated to the syndicate/community for the project. Note that over the coming years more and more shareholder land patches will be added within the same communities.

Figure A3.1: Example letter of INRA declaration for the agrarian syndicate of Tarata


ESTADO PLURINACIONAL DE BOLIVIA

Evo Morales Ayma
PRESIDENTE DEL ESTADO PLURINACIONAL

TÍTULO EJECUTORIAL


Instituto Nacional de Reforma Agraria
INRA

No. TÍTULO PPD-NAL-251146

No. BENEFICIARIOS	No. EXPEDIENTE
1	I-22910



POR CUANTO : JUAN VICENTE GARCIA

MEDIANTE:

TIPO DE INSTRUMENTO LEGAL	CLASE DE PROPIEDAD	ACTIVIDAD	CLASE DE TÍTULO
RESOLUCIÓN SUPREMA	PEQUEÑA	GANADERA	INDIVIDUAL

HA OBTENIDO LA PROPIEDAD DENOMINADA: SIND. AGRARIO DE LA COMUNIDAD DE YANA RUMI - PARCELA 033

CON UNA SUPERFICIE TOTAL DE:	14.1297 HECTÁREAS
CATORCE HECTÁREAS CON MIL DOSCIENTOS NOVENTA Y SIETE METROS CUADRADOS	

A TÍTULO DE: ADJUDICACIÓN

UBICADA EN:

DEPARTAMENTO : COCHABAMBA

PROVINCIA : ESTEBAN ARZE

MUNICIPIO : TARATA

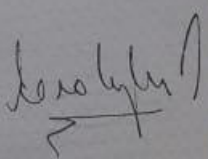
COLINDANCIAS, CODIGO CATASTRAL O GEOCODIGO : VER PLANO ADJUNTO

POR TANTO:

En cumplimiento a la Constitución Política del Estado promulgada en fecha 7 de febrero de 2009, Art. 8 Parágrafo I Numeral 2 de la Ley N° 1715 del Servicio Nacional de Reforma Agraria, modificada mediante la Ley N° 3545 de Reconducción Comunitaria de la Reforma Agraria, Título X, Capítulos I y II del D.S. N° 29215 y la Resolución Suprema N° 05905 de fecha 7 de septiembre del 2011, se expide el presente título ejecutorial, reconociéndose al titular como único y absoluto propietario de las tierras especificadas. Es otorgado, firmado y refrendado en La Paz, a los 16 días del mes de diciembre del año 2013




Ahoy. Juanito Poma. Juan Vicente Garcia
DIRECTOR NACIONAL A.I.
INSTITUTO NACIONAL DE REFORMA AGRARIA



3.04.0.10.0001638 VIGENTE
ESTEBAN ARCE, TARATA
3

030401019033

Tarata:
(PEQUEÑA PROPIEDAD)
SIND. AGRARIO DE LA COMUNIDAD DE YANA RUMI - PARCELA 033
****14.1297 Hectáreas
hectáreas

N.: PLANO ADJUNTO No03-04-01-66-019033
E.: PLANO ADJUNTO No03-04-01-66-019033

S.: PLANO ADJUNTO No03-04-01-66-019033
O.: PLANO ADJUNTO No03-04-01-66-019033

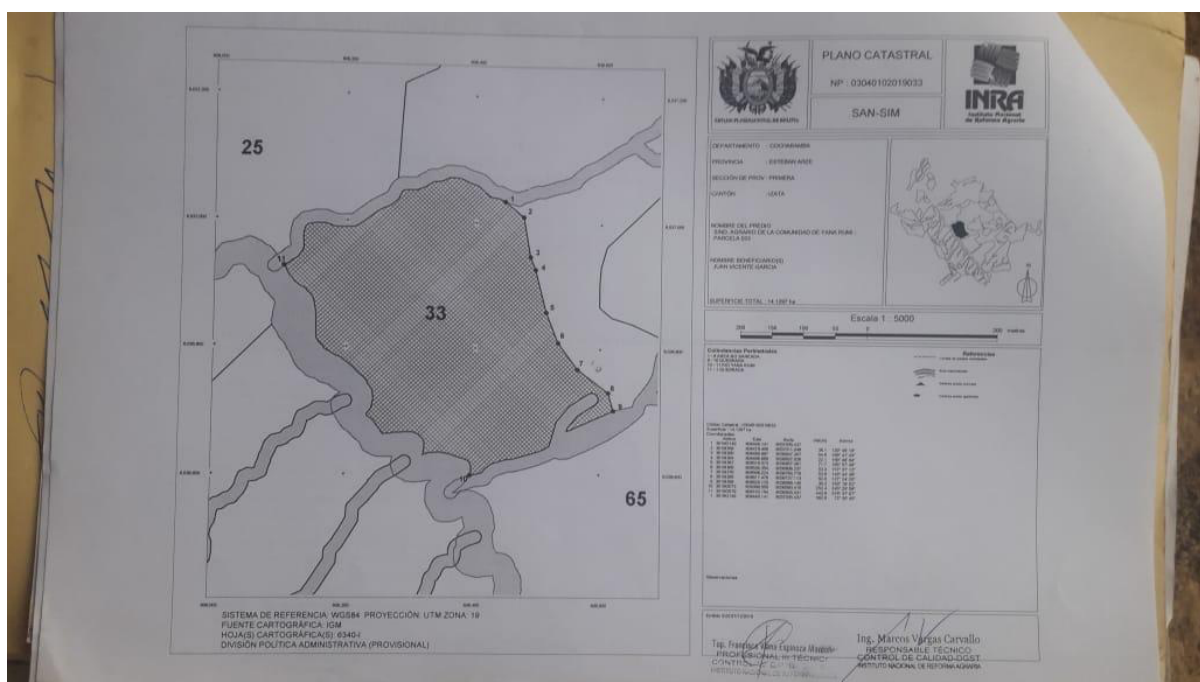
Primer Registro

Asiento Numero: 0-----
Vendedor(es):-----
EL ESTADO BOLIVIANO-----

Asiento Numero: 1-----
VICENTE GARCIA JUAN-----
sol. c/CI 4573106 HSE-----
Boliviense(a)-----
Adjudicación-----
Titulo Ejecutorial Individual No. PP0KAL251146-----
expedido el 16/10/2013 por-----
Juan Evo Morales Alma, Presidente del Estado Plurinacional de Bolivia-----
c/Res:Suprema No. 05905-----
de fecha 07/09/2011-----
Present. - No. 10669 de 28/05/2014. - Hrs.14:11:20-----
[JCS]-[JCS]-[JCS]-----

Asiento No. 1-----
Sub Registrador DERECHOS REALES
Punto Cochabamba - Bolivia

Fecha: 28/05/2014 [Hora: 15:40]



Altamirano Azurduy, Saúl Job.
Biólogo
Av. Cuarto Centenario N° 17 Cochabamba
jobaltamirano@yahoo.es
(591 - 70750011)

INFORME TÉCNICO

A:	Helena Barona Plan Vivo Miro Jacobs Climate Lab.
Via:	Claudio Vázquez Misk'i Kausay

Fecha: 15 de diciembre de 2025

ANTECEDENTES:

El **Instituto Nacional de Reforma Agraria (INRA)** es la entidad encargada del saneamiento y administración de tierras en Bolivia. Los principales documentos que se revisan o que confirman acuerdos vigentes son:

- ✓ **Títulos Ejecutoriales**
 - Son el documento definitivo que acredita la propiedad agraria.
 - Se inscriben en el **Registro de Derechos Reales** junto con planos y coordenadas georreferenciadas.
 - Una vez inscritos, tienen plena validez jurídica.
- ✓ **Certificados de Saneamiento**
 - Emitidos tras el proceso de saneamiento de tierras.
 - Confirman que la propiedad cumple con los requisitos legales y sociales establecidos.
 - Sirven como respaldo para la inscripción en Derechos Reales.
- ✓ **Resoluciones Finales**
 - Determinan la situación jurídica de un predio (propiedad privada, comunitaria o tierra fiscal).
 - Pueden declarar tierras fiscales o anular títulos anteriores emitidos por entidades previas (INC o CNRA).
 - Son vinculantes y se registran oficialmente.

El **Marco normativo** en el país de Bolivia es el siguiente:

- ✓ **Ley N° 1715 (1996):** Ley del Servicio Nacional de Reforma Agraria.
- ✓ **Ley N° 3545 (2006):** Ley de Reconducción Comunitaria de la Reforma Agraria.
- ✓ **Decreto Supremo N° 29215 (2007):** Reglamento de la Ley 1715 y 3545.
- ✓ **Decreto Supremo N° 5143 (2024):** Establece que los documentos emitidos por el INRA (títulos, certificados, resoluciones) deben inscribirse en Derechos Reales para tener plena vigencia.

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CONCLUSIONES:

Los acuerdos sobre tierras en Bolivia tienen vigencia legal únicamente cuando el INRA ha emitido **Títulos Ejecutoriales, Certificados de Saneamiento o Resoluciones Finales**, y estos han sido inscritos en el **Registro de Derechos Reales**.

Por lo tanto, según la revisión efectuada a los beneficiarios de las Comunidades de Yana Rumi y Tunasani, del municipio de Tarata, departamento de Cochabamba, se **concluye que todos tienen el derecho propietario agrario correspondiente**, es importante mencionar que se han revisado todos los títulos ejecutoriales emitidos por el gobierno, y se ha presentado solamente algunas fotocopias de algunos propietarios como anexos, ya que pedir de todos los beneficiarios causaría susceptibilidades a los mismos.


 Saul Job Altamirano A.
EMPRESA UNIPERSONAL
NIT: 3793981018

Lic. Saúl Job Altamirano A.

4. Annex 4 –Participatory Design

See evidence of stakeholder involvement below.



Tarata Municipality, Cochabamba, Bolivia (October 29, 2022). Meeting with the Izata Sub-Central and representatives from the communities of Yanarumi, Tunasani, and others.



Yanarumi Community, Bolivia (27 September 2023). Productive meeting with the beneficiaries of our project from the Yanarumi and Tunasani communities in Tarata Municipality.

Sequence of key events during the project design phase consultations (2.5.1)

Step	Description of event
1	Defining the project idea jointly with experts from the Berto Nicoli Technological Institute
2	Introductory meeting to present the project idea with the natural resources officer of the municipality of Tarata.
3	Field visits with the municipality, community and project representatives, to assess the baseline conditions.
4	Workshop at sub-central administrative level with eight representatives of the communities of Izata. At this meeting, the BoliTrees project coordinator provided an introduction of the project idea.

5	Presentation of the project idea in the communities by the respective representatives.
6	Convention with Izata to start first project activities with the interested communities.
7	Community meeting with the interested communities of Yanarumi and Tunasani, to explain the project idea and the first project steps: plan vivo mapping and assessment of socio-ecological baseline conditions. Followed by baseline data collections: surveys, biomass and soil data.
8	Meeting with Yanarumi and Tunasani for delineation of potential initial project areas.
9	After all baseline data was collected, the project initiated the construction of the nursery to show the good and real intentions of the project.
10	Since water access is key for irrigation of the seedlings in the nursery, successive meetings were organised with the communities of the sub-central until a solution was found.
11	FPIC and risk workshops with the communities of Yanarumi and Tunasani; jointly refining the initial project design. Main changes included on request of the communities are: - The establishment of a <i>Project Directorio</i> to follow-up on all project activities, next to the monthly <i>Community Directorio</i> (community council) - The inclusion of productive shrubs in the early planting stage, good for sharding and providing access to medicinal herbs - Nurturing of horticulture species in the nursery for the community members to provide short term benefits
12	Presenting the updated project design at the municipality and strengthening collaboration with the local government
13	Presenting the updated project design at CETM and strengthening collaboration

5. Annex 5 – Initial FPIC

See example syndicate meeting minutes ("actas") below

Acta de Reunión

En la Comunidad de Jarkapampa del Municipio de Tarata se realizó una reunión de Socialización del Proyecto Restauración y Conservación de Bosques Nativos con la subcentral Izata y se acordó lo siguiente y se realizó las siguientes actividades:

- 1º Socialización del Proyecto
- 2º Elaboración de mapas parlantes
- 3º Entrega de Encuentos a los Dirigentes.
- 4º El 1er Domingo de Septiembre se realizaron los encuentros a los Beneficiarios.

Firman al pie del Acta los Dirigentes.

[Signature]
Ezequiel Prado
Junasani

[Signature]
Fidel Bearra
Tucma Viscachani

[Signature]
Francisco Guevara
Comunidad Calacala 68549836

[Signature]
Ing. Agr. Claudio A. Vázquez S.
Nº Registro: CAVS/0130/07
CIAB - COCHABAMBA

[Signature]
Andrés Escalera
Subanta Izata

[Signature]
Bernardino Guevara = 674526
Dirigente
Potrereros

[Signature]
Juan Vicente García
Su

[Signature]
Lic. San De La Barra



CONSENTIMIENTO PREVIO, LIBRE E INFORMADO

Municipio de: Tarata

Nosotros, los ciudadanos de los pueblos Comunidad Yana Rumi,
hemos asistido hoy a una reunión informativa y explicativa organizada por Climate Lab.

En esta reunión se nos ha explicado claramente que el proyecto Plan Vivo está en proceso de maduración, y que era necesario e incluso imprescindible que las poblaciones fueran informadas previamente, y si están convencidas, puedan dar libremente su consentimiento. La explicación del proceso de este proyecto queda en manos de la comunidad.

Nosotros, los firmantes de este documento, reconocemos que hemos comprendido toda la información que se nos ha dado, y que hemos podido hacer todas las preguntas necesarias para entenderla correctamente. Hemos comprendido las respuestas que se nos han dado. También se nos ha asegurado que Plan Vivo y Climate Lab nos apoyarán durante todo el proceso.

No hemos sido coaccionados ni influenciados en modo alguno para dar nuestro consentimiento. Lo damos por convicción, para que nuestra gestión forestal sea sostenible y los créditos de carbono puedan proporcionarnos alternativas.

Ahora consideramos que tenemos información suficiente para tomar una decisión informada, y aceptamos que Climate Lab y Plan Vivo nos acompañen en el proceso.

Se nos informa de que este documento no sustituye a un acuerdo de colaboración, que se redactará más adelante, con cláusulas de acuerdo claramente definidas entre las partes.



Fecha:

Firmas de todos los presentes:

[Signature]
Sro de Relaciones

[Signature]
Sro de Haciendas

[Signature]
Sra de Actas

[Signature]
Sra de Justicia

[Signature]
Vocal
Juan Vescante

6. Annex 6 – Carbon Calculations Spreadsheet

See Excel sheet attached.

7. Annex 7 – Technical Specifications

Project Intervention:	BoliTrees
Version:	1.1 (version 16/12/2025)
Date Approved:	-
Methodology:	PM001 Agriculture and Forestry Carbon Benefit Assessment Methodology
Modules/Tools:	Module PU001
Certificate Type(s):	rPVCs that transform in vPVCs

Applicability conditions

BoliTrees follows a strict checklist containing the project applicability conditions when considering a potential project area. All project areas must meet these requirements, while the checklist can also be used when identifying candidate plots for expanding the project.

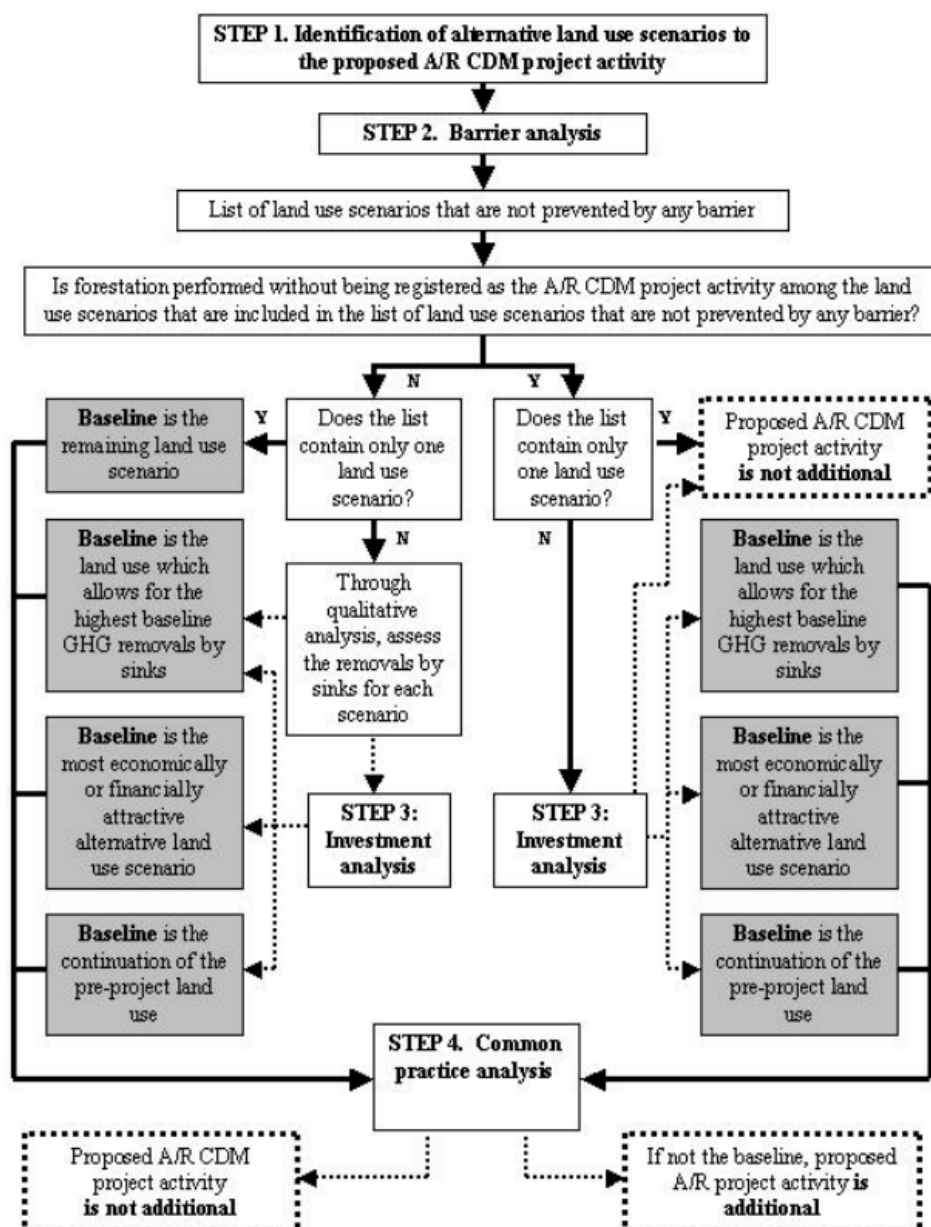
The applicability conditions are:

1. Project areas should be located within the Bolivian Montane Dry and Yungas Forests Ecoregions;
2. A project area can only be located on plots of bush- or grasslands that have signs of bare soil, sheet or rill erosion or periodic grazing, and are largely devoid of trees³. Woodland restoration plantings must be fenced, when relevant, during the first five years.

Additionality

Below we describe the most likely land use scenario in the absence of project interventions and the additionality of the project interventions using AR-TOOL02 v1.0: “Combined tool to identify the baseline scenario and demonstrate additionality in A/R project activities”.

We follow the following steps:



STEP 0. Preliminary screening based on the starting date of the project activity

The starting date of the activity was February 2024. By then, the incentive from the planned project was seriously considered in the decision to proceed with the project activity by the syndicate groups.

STEP 1. Identification of alternative land use scenarios to the proposed project activity

Sub-step 1a. Identify credible alternative land use scenarios to the proposed project activity

Based on the socioecological survey (see §3.3.1), we identify the following land use scenarios to be credible:

- Agroforestry (woodland restoration and fruit agroforestry) on the plots within the project boundaries without being registered as a plan vivo project activity;

- Continuation of the pre-project “bush- and grassland scenario”, consisting of grassland with bushes and occasional trees, but largely devoid of trees. This is a land use under periodic grazing (but without cropping nor fertilizer application, nor frequent fires).

Regarding the timeframe and fire history in the region, due to climate change, rainfall periods are shorter, leading to droughts that cause the grasslands and forests to have a lot of flammable material (dry leaves and grasses). Under the traditional or subsistence agriculture that is dominant, in which crop residues are not composted, these residues are burned, so accidents caused by farmers can occur and these fires cannot be controlled and are then spread by the wind to the grasslands and forests.

As evidence of these accidental fires, some cases were reported in the municipality of Sacaba, in the community of Melga, where a firefighter who was trying to control the fire died from the monoxide produced by the fire. It also happened in the municipality of Boliviari, where some farmers were burning their harvest remains, and because of the wind the fire spread to the pastures, and burned even the farmers' house. Fortunately there was only material damage and no lives were lost on this occasion (all this description is found in newspapers and Bolivian television news).

The frequency of these fires is annual, between autumn, winter and spring, until the summer rains begin (in the inter-Andean valleys, the frequency of rains is approximately 3 months: November, December, January). Yet, it currently begins in late November and lasts until February, possibly due to the effects of climate change. In fact in these areas, there is a maximum of 3 months of rain and then drought, the months most prone to have fires are therefore the months of August, September, October.

Maillard et al. (2022) analysed fire occurrence in the Key Biodiversity Areas (KBAs) of Bolivia (sites that contribute significantly to the protection of the planet's biodiversity). The authors evaluated the annual burned areas and the intensity of the fires over the last 20 years (2001–2020). Focussing on the Upper Yungas of Carrasco (“KBA 33”), adjacent to the Tiraque project areas, it was shown that 42,034 ha of 226,003 ha were burned during this period. This relates with a burnt area of 18.6% between 2001–2020. However, in terms of frequency, the occurrence of these fires was mainly recorded only once per two decades (85.5% of the KBA affected) – while in only 13.2% of the KBA affected, the fires occurred twice to four times per two decades.

We can conclude that fires impacted a significant part of the Carrasco Upper Yungas over the past two decades, but the fire frequency is generally very low.

Sub-step 1b. Consistency of credible alternative land use scenarios with enforced mandatory applicable laws and regulations

Both alternative land use scenarios are in compliance with mandatory legislation and regulations taking into account their enforcement in Bolivia. Continuation of the status quo is in agreement with laws and regulations, while spontaneous (agro)forestation is obviously also a land cover type that is allowed by applicable regulations.

STEP 2. Barrier analysis

Sub-step 2a. Identification of barriers that would prevent the implementation of at least one alternative land use scenarios

No financial, technical, institutional nor social barriers would plausibly hamper the continuation of the *continued bush- and grassland scenario*. Continuation of the current landscape scenario requires no investments, technical knowledge nor legal efforts: the project areas are regularly affected by

grazing (see further). However, (agro)forestation without extra funding is not a plausible scenario, given the significant amount of funding required and the lack of nurseries and fruit trees in the area.

Sub-step 2b. Elimination of land use scenarios that are prevented by the identified barriers

We eliminate the scenario of forestation without extra funding, since it is not a plausible future land cover scenario, given the lack of antecedents, the significant amount of funding required and the lack of nurseries in the area. We refer to the financial plan (Annex 16).

Sub-step 2c. Determination of baseline scenario (if allowed by the barrier analysis)

Forestation without being registered as a plan vivo project is not included in the list of land use scenarios that are not prevented by any barrier. Consequently, only one land use scenario remains (*continued bush- and grassland scenario*), so according to the tool, this scenario is the baseline scenario. We continue with Step 4: Common practice test.

STEP 4. Common practice analysis

There are no similar previous or ongoing (agro)forestation activities in or near the project zones, not even remotely similar to this proposed plan vivo registered project. Consequently, the plan vivo project activity is not the baseline scenario and, hence, it is additional. The “continued bush- and grassland scenario” becomes the baseline scenario.

Finally, below we present a summary of the basic barriers the project activities are to overcome.

Table 1: Main barriers for the project activities to overcome: see Table 3.7 of the PDD.

Project activities

Agroforestry is a traditional Andean land-use practice dating back to pre-colonial times (before 1530), when trees and shrubs were planted in agropastoral landscapes for use as timber and fuelwood, as well as to improve soil productivity and stabilize slopes and terraces (Chepstow-Lusty and Winfield 2000; Brandt et al. 2011). However, in the Bolivian Andes, agroforestry systems using native woody species are rarely actively implemented today compared to the more productive exotic Eucalyptus and Pinus plantations, because smallholders prefer to invest in land-use systems that are more profitable in the short term (Brandt et al., 2013). To reverse this trend, drawing attention to the economic potential and cultural importance attributed to plants proved to be a key factor in motivating farmers to better manage the woody species growing on their farmland (Brandt et al., 2013; Alavalapati et al. 2004). To that end, the project developed an agroforestry system that relies on indigenous, traditional and naturalized plants while bringing clear benefits to the livelihoods of smallholder farmers. The system was designed and adapted by Misk'i Kausay and integrates silvopastoral forest plots with home fruit orchards.

Silvopastoral forest

First, seedlings of tree species are raised in open-air nurseries. The seedlings are raised in bags containing a mixture of three soil components: (i) compost or black soil; (ii) local topsoil; and (iii) fine sand or silt. Large seeds are planted directly in planting bags (25 cm high x 15 cm wide), while small seeds are first germinated separately and then planted in a bag. Seedlings should remain in the nursery for 8 months to 1 year.

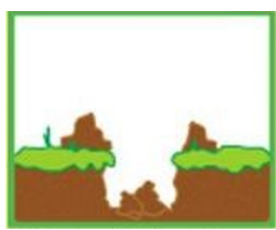
After their stay in the nursery, the seedlings are distributed free of charge and planted in the assigned plots. Planting is done after removing local weeds and within small holes of about 30x30 cm. Two shovelfuls of compost mixed with local soil are added and sometimes hydrogel grains are also added. Micro-irrigation (e.g. from nearby ponds) is applied when necessary. Thus, after having a homogeneous mixture, a shovel will be mixed with the hydrogel already hydrated (1kg is emptied into a plastic barrel with a capacity of 200 liters, of which about 150 liters of water), and then placed at the base of the hole. Then, one proceeds to place the forest seedling, and the rest of the mixture of the substrate.

The planting mix is composed of trees (Aliso, Kewiña, Kiswara) from high altitudes (between 2900 to 3200 masl), trees (Tipa, Jacaranda, Jarca or Molle) from intermediate zones (between 2600 to 2900 masl), and trees (Algarrobo, Tara, Soto or Molle) from low altitudes (2000 to 2600 masl). These trees are, planted, sown or regenerated until the final stem density of about 400 forest trees per hectare is achieved (usually a mixture of 3 species). The trees are never felled, but can be pruned annually from below (after the first five years). The survival rate is above 70%.

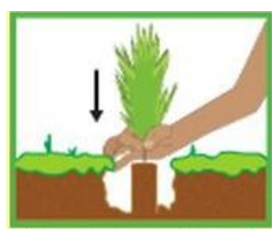
Important non-timber forest products include the fruits of Tara (the fruits are high in tannins and are used for tanning leather, also as an additive in sausages) and Algarrobo (the fruits have more vegetable protein than soybeans), the leaves/fodder of Tipa, and the appearance of Lokosti or Granadilla (*Passiflora ligularis*) near Kewiñas and other native forest species. When developing the silvopastoral and agroforestry system, the amounts of trees, bushes and native/autochthonous herbaceous plants with melliferous potential begin to diversify, thus being able to have apiaries of the *Apis melífera* species (bees with sting) in low and medium zones. In the lower zones, one can expect meliponariums with *Tetragonisca angustula* and other meliponas (stingless bees native to America), potential pollinators of trees, bushes and herbaceous plants from a range of 1.5 km (meliponas) to 3 to 5 km (*Apis melífera*). After about 4 to 5 years, when the trees are of considerable size and grasses and herbs grow naturally, livestock are allowed to re-enter the plots, allowing the final silvopastoral land use and manure to return to the soil. Pruning is allowed: branches can be extracted from the forest for firewood, and the dry leaves will be kept and composted in the same plots (generally after the end of winter).



1 Cavar la tierra en una superficie de 40 por 40 centímetros de profundidad



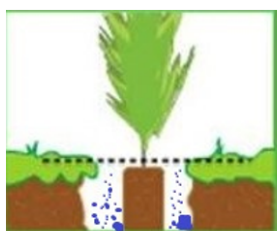
2 En el centro abre un hueco tan ancho y profundo como la raíz de la planta



3 Toma la planta de la parte mas baja del tallo con dos dedos no maltrates ni toques la raíz



4 Ponla en el hueco al ras de suelo



5 Colocar hidrogel 6 gramos



6 Cubre la raíz de la planta con tierra



7 Compacta la tierra con las manos, no debe quedar ni muy floja, ni muy apretada



8 Haz un muro canaleta alrededor de la planta para facilitar la retención de agua, riega abundantemente

Figure 1: Schematic figure on the process of seedling planting.

Fruit orchards

Secondly, seedlings of fruit species are first raised in a small greenhouse, where they are grafted and should remain for about a year. After one year, the seedlings are transferred to a nursery where they will remain for another year. The bags contain a similar mixture of three soil components: (i) compost or black soil; (ii) local topsoil; and (iii) fine sand or silt. In general, the planting bags for fruit trees are somewhat larger (25x20 cm) than those for forest plots (25x15 cm).

The planting design is in a real frame with straight intersecting lines in flat areas, and in oblique intersecting lines on slopes; the distance between forest tree and fruit trees is 1.5 m, and between rows 2 m. To plant the fruit trees, holes of 40-50 cm (width), by 40-50 cm (depth) are made. The soil will be left in the sun for a couple of days, and at the day of planting this will be mixed with the composted soil, about 5 to 10 shovels, after having a homogeneous mixture. A shovel is mixed with the hydrogel that needs to be already hydrated (1kg is emptied into a plastic barrel with a capacity of 200 liters, of which 150 liters of water), and then placed at the base of the hole, and then one proceeds to place the seedling, and the rest of the mixture of the substrate.

Planting is thus done at a rate of about 3200 trees per hectare, depending on the planting design. A natural composted manure (Bocashi, compost, worm humus) is added, and foliar biofertilizers (Biol, manure tea, worm humus leachate), also bio fungicides (Caldo sulfocalcico, caldo ceniza, caldo bordeles) and bio insecticides (extracts of plants native to the area to use as repellents) are applied.

One year after the planting of the forest species, the fruit species (mainly apple, but also peach, custard apple and avocado) and shrub species (lavender, rosemary, cedron and others) will be placed in the holes where the forest and fruit trees are located, in order to diversify the plots. Thus, in these home orchard plots, a forest tree is planted in the rows first (first year), then a fruit tree (second year), a forest tree (first year), a fruit tree (second year) and so on. The distance between rows is 2 meters. Finally, about 1600 fruit trees are combined with about 1600 forest trees (i.e. around 530 forest trees per specie). Only the fruit trees receive an additional 10kg of manure per tree per year.

Annual crops such as corn, beans, alfalfa, potatoes, wheat, and others are planted in between the rows. There is a cycle in which grains are sown the first year (e.g. maize), tubers the second year (e.g. onion, potato) and beans combined with grasses are sown the third year. Thus, every 3 years, livestock can enter the orchard for grazing the grasses. In this way, an alternating system of fruit trees - forest trees - fruit trees is established and interspersed with pastures, annual crops (grains, tubers and beans) and flowering shrubs (lavender, rosemary, cedron) to support crop diversification in the agroforestry system and the biodiversity of the ecosystem. In general, this leads to a distance of 1m-1.5m between trees and 2m between tree lines.

In terms of long-term tree management, frequent pruning is common. Fruit trees should reach about 2m in height, while forest trees grow much taller (up to 2.5m in height). Pruned wood can be used as firewood (except for the first two years), but the forest trees are not cut down. Rest material from pruning will be left around to allow material to decompose there and serve as fertilizer, as well as to prevent soil evapotranspiration. The forest trees are never harvested, while the fruit trees are harvested every 25 years and replanted.

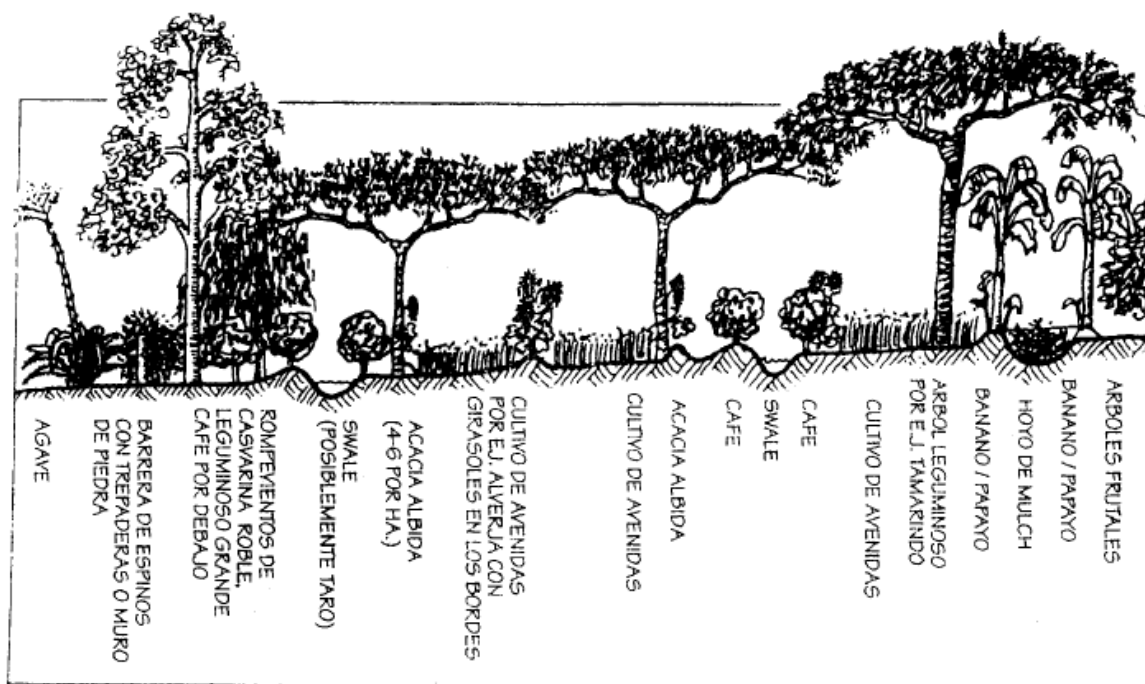


FIGURA 5.11 El cultivo con árboles leguminosos, zanjas, cercas vivas y rompevientos.

Figure 2. Example sketch of a homegarden fruit plot, mixing fruit trees, forest trees, grasses, vegetables and floral shrubs.

Note that the overall survival rate of 70% is based on the field experiments by Misk'i Kausay over the past 3 years. In the case of forest species, we have to take into account the following:

- Prolonged droughts and lack of water in the early stages of development of native forest plantations. If we manage to do the planting at the beginning of the rainy season, between November and December, we will get the plants to withstand the new rainy season. So if it is a good year, it will rain in November, December, January, and maybe half a month of February, then the other 9 months the plants have to survive, with the strategy that is proposed by the project, such as hydrogel, irrigation by the community members, vegetation cover on the seedlings, etc.).

In the case of fruit species, we have to take into account the following:

- To have a water reservoir (circular pond), with which we can operate an irrigation system such as drip irrigation, to guarantee the growth in the agroforestry system (fruit trees and forestry).

Carbon benefits

Crediting Period

This is an intervention based on a 35-year registration period. Direct payments will be made to the participants on a yearly basis, in line with the achievement of the milestone targets.. The payments also support the participating smallholders with cash to meet their direct livelihood needs. Thereafter, the project will keep monitoring for another 15 years, bringing the total project period to 50 years.

The formal start date of the endorsed activities and the crediting and project period is 1 February 2024. This follows after two years of project initiation (including starting to protect the project areas in 2022).

After roughly 10 years, smallholders will also benefit from the fruit and honey production, the pruning (firewood), and the grass and fodder production (livestock feeding) in addition to their yearly payments.

Carbon Pools and Emission Sources

These technical specifications are developed using Module PU001. We include the following carbon pools (Table 2):

Table 2. Carbon pools included in the calculations.

Carbon pool	Included?	Justification/Explanation
Above-ground woody biomass	Yes	This is a potentially significant pool and is considered for tree planting and agroforestry activities
Below-ground woody biomass	Yes	This is a potentially significant pool and is considered for tree planting and agroforestry activities
Non-tree biomass	No	Although not explicitly included in the accounting, crop residues are modelled and included as an input to the soil organic carbon pool where appropriate
Dead wood	No	Although not explicitly included in the accounting, dead wood is modelled and included as an input to the soil organic carbon pool where appropriate
Litter	No	Although not explicitly included in the accounting, tree litter inputs are modelled and included as an input to the soil organic carbon pool where appropriate
Soil organic carbon	Yes	This is a major pool affected by tree planting, agroforestry and agricultural activities
Wood products	No	Wood products are not accounted for, and are conservatively excluded

This intervention is targeting plots that are currently largely devoid of trees, basically bush- and grasslands. It is assumed that the current woody biomass stock on the plots would remain static under both the baseline scenario and under the project intervention scenario. Indeed, given among others the lack of nurseries in the region, it is highly unlikely that smallholders would independently plant trees on their plots without extra project support.

Baseline Emissions/Removals

Currently, the project areas basically consist of bushy grassland, largely devoid of trees. Without improved management and seedling planting, we can reasonably expect a stable system where future carbon sequestration will be very limited. Note that in the inter-Andean valleys, it is not customary to burn. In the Yungas area, burning happened in the past, in order to make land available for grazing or agriculture during the dry season.



Figure 3: Illustrations of baseline conditions in Tarata.

In Appendix A, we present sentinel-2 derived False Color Composites of the Tarata landscape between 2016 and 2022 (Google Earth Engine, 2023). Spectral band 8 of the Multispectral Imager (MSI) delivers the chlorophyll-reflecting central wavelength of 842 nm (Visible and Near Infrared, VNIR), suitable for mapping biomass content, as well as at detecting vegetation changes. The spatiotemporal analysis shows no vegetation increase in the project patches of Tarata (2016-2022). The satellite images corroborate the lack of forests or woody vegetation, and the stability of the bushy grassland landscape within the project patches.

We can thus expect the change in carbon stock in the project zones to be stable in the baseline scenario, under continued or even increasing hydroclimatic pressures. Photographs testify to the stable status in 2022. Without active nurseries, distribution of seedlings, investment funding, planting and training on management techniques, we can expect a stable baseline where future carbon stocks will not increase. Indeed, it is highly unlikely that farmers would independently plant trees on the plots without nurseries or without extra project support. Overall, we can reasonably assume that there is no change in carbon stock in the baseline scenario as compared to the initial carbon stock: $\Delta C_{\text{baseline}} = 0$.

In more standardized terms, Plan Vivo Module PU001 (applicable for Agroforestry) requires “no change in woody biomass carbon stocks if the conditions in AR-TOOL14 v4.2 section 5 are met” (§5.1.2). The AR-TOOL14 v4.2 states in section 5: “Changes in carbon stocks in trees and shrubs in the baseline may be accounted as zero for those lands for which the project participants can demonstrate, through documentary evidence or through participatory rural appraisal (PRA), that one or more of the following indicators apply:

- i. Observed reduction in topsoil depth (e.g. as shown by root exposure, presence of pedestals, exposed sub-soil horizons);
- ii. Presence of gully, sheet or rill erosion; or landslides, or other forms of mass movement erosion;
- iii. Presence of plant species locally known to be indicators of infertile land;
- iv. Land comprises of bare sand dunes, or other bare lands;

v. Land contains contaminated soils, mine spoils, or highly alkaline or saline soils;

vi. Land is subjected to periodic cycles (e.g. slash-and-burn, or clearing regrowing cycles [or periodic grazing]) so that the biomass oscillates between a minimum and a maximum value in the baseline.”

We note that the above underlined conditions are valid and safeguarded as project applicability conditions.

We finally note that following AR-TOOL14 v4.2 section 5, carbon stock in orchard trees in the baseline can be accounted as zero if all of the following conditions are met:

(a) The pre-project trees are neither harvested, nor cleared, nor removed throughout the registration period of the project activity;

(b) The pre-project trees will not suffer mortality because of competition from trees planted in the project, or damage because of implementation of the project activity, at any time during the registration period of the project activity;

(c) The pre-project trees are not inventoried along with the project trees in monitoring of carbon stocks but their continued existence, consistent with this baseline scenario, will be monitored throughout the crediting period of the project activity.

Sheet and rill erosion are present in all project areas (photographic evidence here below, Figure 4).





Figure 4: (above) Gullying in project area Yanarumi, 2022; (below) Pedestal erosion in project area Sub Central de Izata, 2022.

Expected Project Emissions/Removals

Expected changes in carbon are calculated PU001 through AR-TOOL14: Estimation of carbon stocks and change in carbon stocks of trees and shrubs in A/R CDM project activities, Version 4.2.

At project start, expected project removals in woody biomass must be estimated through the modelling of tree growth development following the procedures in AR-TOOL14 v4.2 Section 8.2. That method is used for ex-ante estimation (initial projection) of carbon stock in tree biomass. One must select a fitting growth model to predict the growth of trees and the development of the tree stand over time. Here, we select the growth model of Shiomara & Azero (2018), since it was specifically calibrated in similar agroforestry systems in the villages of Tarata and Sacaba in the project region. The study is fully presented in Annex B.

Through measuring the detailed growth characteristics and tree densities (D) of 2523 trees in local agroforestry plots of different ages (A), Shiomara & Azero (2018) obtained the following strong regression model for AGB:

$$AGB \left(\frac{tC}{ha} \right) = 3.0302 + 1.15A + 26.11D \quad (p = 0.0133 ; R^2 = 0.71 ; \text{Residual SE} = 5.14)$$

We separately applied the root:shoot ratio of Mokany et al. (2006) for a subtropical dry woodland (see Annex 6), in line with the CDM tool. SOC changes can be calculated using AR-TOOL16: Tool for estimation of change in soil organic carbon stocks due to the implementation of A/R CDM project activities, Version 1.1. Based on §11 of the tool, considering uncertainties and inherent limitation of the precision of a factor-based estimation, the value of the rate of change of SOC stock is not accounted as more than 0.8 tC/ha/yr (Annex 6). Note that in any agroforestry setting, a soil sequestration rate of 0.8 tC/ha/yr is extremely conservative.

Note that the trees are never felled and never thinned. Trees can be pruned from below (after the first five years). However, the carbon estimations are based on the model of Garcia and Azero (2020) that was explicitly calibrated in dynamic agroforestry systems that already underwent pruning (P23):

“In this sense these agroforestry systems, but especially dynamic agroforestry systems (DAS), are characterized by a high biodiversity of woody species, by including productive and companion species, by an energetic management of pruning and by the use of different strata of vegetation. They are really a productive alternative with multiple potential benefits.”

This leads to the following Expected Project Emissions/Removals:

Silvopastoral forest plots

A (yr)	Project D (#/m ²)	AGB (tC/ha)	BGB* (tC/ha)	Woody Biomass (tCO ₂ e/ha)
1	0.048	5.43	1.75	26.36
5	0.048	10.03	3.23	48.68
10	0.048	15.78	5.08	76.58
15	0.048	21.53	6.93	104.47
20	0.048	27.28	8.79	132.37
25	0.048	33.03	10.64	160.27
30	0.048	38.78	12.49	188.17
35	0.048	44.53	14.34	216.06

Fruit orchards

A (yr)	Project D (#/m ²)	AGB (tC/ha)	BGB* (tC/ha)	Woody Biomass (tCO ₂ e/ha)
1	0.256	10.86	3.50	52.71
5	0.256	15.46	4.98	75.03
10	0.256	21.21	6.83	102.93
15	0.256	26.96	8.68	130.82
20	0.256	32.71	10.53	158.72
25	0.256	38.46	12.39	186.62
30	0.256	44.21	14.24	214.52
35	0.256	49.96	16.09	242.41
SOC**				102.76

*Based on Root:Shoot ratio for Tropical/subtropical/temperate dry woodland (see §Monitoring)

**Based on AR-TOOL16 (0.8 tC/ha/yr over 35 years)

In conclusion, the Expected Project Emissions/Removals, after a registration period of 35 years, equals 319 tCO₂e/ha for the silvopastoral woodlands and 345 tCO₂e/ha for the fruit orchards.

Potential Leakage

Leakage is defined as a reduction in carbon stocks or increase in greenhouse gas emissions outside the project area, as a result of project activities. The main potential source of agroforestry leakage would clearly come from displaced grazing, i.e. grazing pressure displaced towards other nearby areas because grazing is no longer possible inside the project areas.

This technical specification uses AR-TOOL15 version 2.0 to estimate leakage significance: A/R Methodological tool – Estimation of the increase in GHG emissions attributable to displacement of pre-project agricultural activities in A/R CDM project activity. The tool states under §10: “Leakage emission attributable to the displacement of grazing activities under the following conditions is considered insignificant and hence accounted as zero (applicable conditions are underlined):

- (a) Animals are displaced to existing grazing land and the total number of animals in the receiving grazing land (displaced and existing) does not exceed the carrying capacity of the grazing land;
- (b) Animals are displaced to existing non-grazing grassland and the total number of animals displaced does not exceed the carrying capacity of the receiving grassland;
- (c) Animals are displaced to cropland that has been abandoned within the last five years;
- (d) Animals are displaced to forested lands, and no clearance of trees, or decrease in crown cover of trees and shrubs, occurs due to the displaced animals;
- (e) Animals are displaced to zero-grazing system [e.g. feeding boxes fed by the fodder-producing trees such as Tipa].

Fodder-producing trees (e.g. Tipa) are part of the planting mix while livestock will be able to re-enter the silvopastoral woodlands areas five years after planting. In general, the extent of grazing areas or the grazing intensity will not increase as a result of project activities, because an equivalent amount of fodder will be provided through fodder-producing trees and silvopastoral use of the project areas will be allowed after five years.

In Tarata, there are only 47 members in the syndicate. The average amount of cattle is about 3 animals (cows). The overall livestock units affected are thus very limited; the effect is expected to be negligible.

Even extrapolating a total of 20 435 Tropical Livestock Units (TLU) for each municipality, the estimated average livestock density of 0.12 TLU/ha over the village territory remains much lower than optimal stocking rates (0.69 TLU/ha according to Nyssen et al. (2004) for highland pasture zones). Note that a Tropical Livestock Unit is equivalent to a standard ox of 250 kg (FAO, 1988); for each other type of domestic animal there is a conversion equivalent.

According to the Plan Territorial de Desarrollo Integral, extra municipal efforts are made to invest in pasture management and control the animal load, and optimize soil management. The project too will organise workshops to support feeding-in-the-stable.

With the project and the workshops that will be carried out, the communities will be able to see the benefits of sustainably managing and conserving their agroforestry plots, making more efficient use of their resources according to their ecological levels: use vegetation cover to avoid evapotranspiration of forest seedlings, stabling their livestock at certain critical periods to avoid overgrazing, diversify their agricultural production with traditional annual crops through crop rotation and permanent crops (nopal (*Opuntia* sp.), carob (*Prosopis* sp.), tara (*Caesalpinia spinosa*), beekeeping, and meliponiculture.

To further reduce possible leakage, extra applicability conditions are included and milestone-based monitoring is proposed, based on independent information collected from the individual farmers. Payments are thus delivered upon achievement of each of the milestones. Whenever milestones are missed, corrective actions must be implemented before the payments can be issued.

Uncertainty

AR-Tool14 states in §8.2: “Ex-ante estimation (projection) of carbon stock in tree biomass is not subjected to uncertainty control, although the project participants should use the best available data and models that apply to the project site and the tree species”. It is therefore not necessary to control for uncertainty estimation as described in PU005.

Expected Carbon Benefits

Agroforestry provides various ecosystem services and environmental benefits while promoting eco-intensification based on more efficient use of the resources. Agroforestry systems can sequester a significant amount of carbon in above ground biomass (including trees and crops or grasses), roots and soil. Researchers showed that agroforestry systems play an effective role in global carbon sequestration, in carbon capture and in the long-term storage of atmospheric carbon dioxide. Agroforestry can often enrich soil organic carbon (SOC) better than monocropping systems, thereby reducing greenhouse gas emissions. The high diversity of woody plants and relatively better management (fencing, watering of seedlings) by farmers can be the main reasons for successful carbon sequestration by agroforestry trees. Silvicultural practices including pruning and lopping of branches allow regrowth of high amounts of biomass in short periods of time.

We refer to the Tables below to summarize the Expected Carbon Benefits.

Expected Carbon Benefits Summary

Project Intervention	Initial carbon stock (tCO ₂ e/ha)	Baseline Emissions (t CO ₂ e/ ha)	Project Emission (t CO ₂ e/ha)	Leakage Emissions (t CO ₂ e/ha)	Carbon Benefit (t CO ₂ e/ha)
Silvopastoral forest plots	0	0	-319	0%	-319
Fruit orchard	0	0	-345	0%	-345

Plan Vivo Certificate Potential

Project Inter-vention	Carbon Benefit (tCO ₂ e/ha)	Project Area (ha)	Total Carbon Benefit (t CO ₂ e)	Risk Buffer (tCO ₂ e /ha)	Leakage Buffer (tCO ₂ e /ha)	Achievement reserve (tCO ₂ e /ha)	Uncertainty buffer	Pot. PVCs (t CO ₂ e)
Silvopastoral forest plots	-319	250	-79750	20%	0	10%	0%	-55825
Fruit orchard	-345	100	-34500	20%	0	10%	0%	- 24150
TOTAL		350	-111 650	20%	0	10%	0%	- 79975

Monitoring

The project will rigorously keep track of the performance of each smallholder plot over time. Each plot has a project agreement with a plan vivo map, along with a monitoring scheme specifying the performance-based milestones.

Milestone-based monitoring scheme for each project plot

Time of measurement (yr)	Performance-based milestone	Method of measurement	Relative payment
0 (within one year of planting)	At least 50% of the planned number of trees is planted or managed correctly with controlled grazing	Physical counting of all trees	Free seedlings
1	100% of the planned number of trees planted, or managed correctly with controlled grazing	Physical counting of <i>all</i> new trees planted	Annual payments*
3	At least 70% of the planted or raised trees surviving in the native forests by protecting micro-watersheds with defensive structures or living or dead barriers	Physical counting of <i>all</i> the surviving trees	
5	An average DBH of at least 3cm	DBH measurements, based on a representative sample	

		of at least 10% of the trees concerned	
7	Average DBH of at least 5cm	DBH measurements, based on a representative sample of at least 10% of the trees concerned	
10	An average DBH of at least 7cm	DBH measurements, based on a representative sample of at least 10% of the trees concerned	
11-35	Permanence of the existing trees	Annual counting based on a representative sample of at least 10% of the trees concerned or remote sensing equivalent	

*A successful assessment of the performance phase is determined by a combination of the judgement of technicians in the field and data analysis in the office. If the technicians and data indicate that the producer has met the target, full payment is received every year. If the threshold is not met, payments are withheld until the targets are met the following year. In this case, the project will explore with the smallholder how to support tree growth in its field.

It is important to note that *all* project plots are visited by project staff or by a community liaison officer in the years specified in the Monitoring Table.

At the first three milestone checks, all planted trees are observed (to count the number planted and the survival rate). At the last three milestone checks, diameter at breast height is measured for every project plot at a representative subpopulation of that plot (subpopulation equal to 10% of the total planted trees in the project plot). The subpopulation of 10% of the planted trees is sampled during linear transect walks crossing the project plot and recording every tree encountered (until the 10% target is obtained). Alongside DBH measurements, species, number of trees and health status are recorded as well.

The project customized a QField application to oversee and manage the large amount of data that are generated.

APPENDIX A

Sentinel-2 derived False and True Color Composite of Tarata vegetation (Bolivia) between 2016 and 2022 (Google Earth Engine).

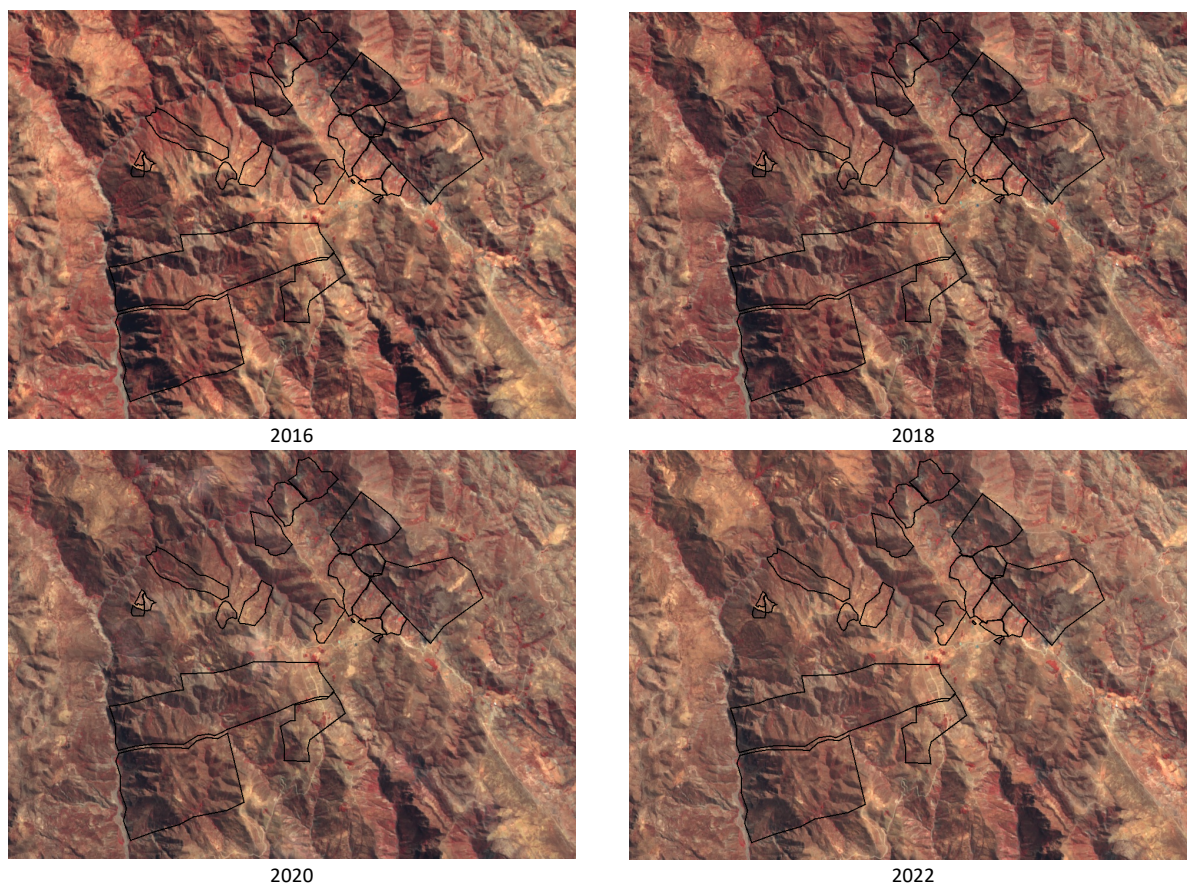


Figure: Sentinel-2 derived False Color Composites of Tarata project area in Bolivia between 2016 and 2022. The project zone is delimited by a black line on the satellite derived image.

APPENDIX B

We refer to the paper by Shiomara & Azero (2018), available upon request

APPENDIX C

7C1. Manejo Agroecológico en Vivero e Invernadero.

MANEJO AGROECOLOGICO EN INVERNADERO		ENERO/JULIO				FEBRERO/AGOSTO				MARZO/SEPTIEMBRE			
No	ACTIVIDADES	S 1	S 2	S 3	S 4	S 1	S 2	S 3	S 4	S 1	S 2	S 3	S 4
1	Preparación de sustratos y almacenado de forestales y frutales	X	X										
2	Transplante o plantación al invernadero de los almácigos			X	X	X	X						
3	Incorporación de abono descompuesto o compost o humus de lombriz	X				X				X			
4	Aplicación de Biol, Lixiviado humus de lombriz (Fertilizantes foliar ecológico)				X	X	X		X		X		X
5	Aplicación de Biomax al suelo (Microorganismos beneficios)	X	X	X	X	X		X		X		X	
6	Aplicación de Caldo sulfocálcico (Bioinsecticidas)					X				X			
7	Aplicación de Caldo ceniza (Bioinsecticidas)							X				X	
8	Aplicación de Extractos de ajo, locoto y otros (Bioinsecticidas)						X		X		X		X
9	Trampas de Color con aceite sucio (Control etológico)							X			X		X
10	Deshierbe parcelas, podas, tutorado					X			X			X	
11	Riego tecnificado (Goteo)	X	X	X	X	X	X	X	X	X	X	X	X
12	Cosecha (Se puede tener lechugas y acelgas en el 2o y 3r mes)						X		X		X		X
MANEJO AGROECOLOGICO EN INVERNADERO		ABRIL/OCTUBRE				MAYO/NOVIEMBRE				JUNIO/DICIEMBRE			
No	ACTIVIDADES	S 1	S 2	S 3	S 4	S 1	S 2	S 3	S 4	S 1	S 2	S 3	S 4
1	Incorporación de abono descompuesto o compost o humus de lombriz	X				X				X			
2	Aplicación de Biol, Lixiviado humus de lombriz (Fertilizantes foliar ecológico)		X		X		X		X		X		X
3	Aplicación de Biomax al suelo (Microorganismos beneficios)	X		X		X		X		X		X	
4	Aplicación de Caldo sulfocálcico (Bioinsecticidas)	X				X				X			
5	Aplicación de Caldo ceniza (Bioinsecticidas)			X				X				X	
6	Aplicación de Extractos de ajo, locoto y otros (Bioinsecticidas)		X		X		X		X		X		X
7	Trampas de Color con aceite sucio (Control etológico)			X				X			X		X
8	Deshierbe parcelas, podas, tutorado	X			X	X			X			X	
9	Riego tecnificado (Goteo)	X	X	X	X	X	X	X	X	X	X	X	X
10	Cosecha (Lechugas, acelgas, tomates y pimentones)	X		X		X		X		X		X	

7C2. Manejo Agroecológico en Sistemas Agroforestales.

MANEJO AGROECOLOGICO DE FRUTALES DE VALLE (VERANO)						DICIEMBRE				ENERO				FEBRERO			
No	ACTIVIDADES					S1	S2	S3	S4	S1	S2	S3	S4	S1	S2	S3	S4
1	Aplicación de Biól, Lixiviado humus de lombriz (Fertilizantes foliar ecológico)					X				X				X			
2	Aplicación de Biómax al suelo (Microorganismos beneficios)							X				X				X	
3	Aplicación de Caldo sulfocálcico (Bioinsecticidas)					X								X			
4	Aplicación de Caldo ceniza (Bioinsecticidas)							X				X					
5	Aplicación de Extractos de ajo, locoto y otros (Bioinsecticidas)									X						X	
6	Trampas de Vinagre, azúcar y colorante (Control Mosca de la fruta)						X				X				X		
7	Deshierbe y podas en verde y raleo de frutos cuajados						X				X				X		
8	Riego tecnificado (Goteo)					X		X		X		X		X		X	
MANEJO AGROECOLOGICO DE FRUTALES DE VALLE (OTOÑO)						MARZO				ABRIL				MAYO			
No	ACTIVIDADES					S1	S2	S3	S4	S1	S2	S3	S4	S1	S2	S3	S4
1	Aplicación de Biól, Lixiviado humus de lombriz (Fertilizantes foliar ecológico)					X				X				X			
2	Aplicación de Biómax al suelo (Microorganismos beneficios)							X				X				X	
3	Aplicación de Caldo sulfocálcico (Bioinsecticidas)					X								X			
4	Aplicación de Caldo ceniza (Bioinsecticidas)							X				X					
5	Aplicación de Extractos de ajo, locoto y otros (Bioinsecticidas)									X						X	
6	Trampas de Vinagre, azúcar y colorante (Control Mosca de la fruta)						X				X				X		
7	Deshierbe parcelas y podas en verde de frutales						X				X				X		
8	Riego tecnificado (Goteo)					X		X		X		X		X		X	
9	Cosecha									X		X		X		X	
MANEJO AGROECOLOGICO DE FRUTALES DE VALLE (INVIERNO)						JUNIO				JULIO				AGOSTO			
No	ACTIVIDADES					S1	S2	S3	S4	S1	S2	S3	S4	S1	S2	S3	S4
1	Aplicación de Biól, Lixiviado humus de lombriz (Fertilizantes foliar ecológico)																
2	Aplicación de Biómax al suelo (Microorganismos beneficios)																
3	Aplicación de Caldo sulfocálcico (Bioinsecticidas)							X		X		X			X		X
4	Aplicación de Extractos de ajo, locoto y otros (Bioinsecticidas)																
5	Aplicación de Caldo ceniza (Bioinsecticidas)																
6	Aplicación de Estiercol Descompuesto o Compost o Bocashi					X				X				X			
7	Deshierbe y podas de invierno																X
8	Riego tecnificado (Goteo)					X										X	
MANEJO AGROECOLOGICO DE FRUTALES DE VALLE (PRIMAVERA)						SEPTIEMBRE				OCTUBRE				NOVIEMBRE			
No	ACTIVIDADES					S1	S2	S3	S4	S1	S2	S3	S4	S1	S2	S3	S4
1	Aplicación de Biól, Lixiviado humus de lombriz (Fertilizantes foliar ecológico)					X				X				X			
2	Aplicación de Biómax al suelo (Microorganismos beneficios)							X				X				X	
3	Aplicación de Caldo sulfocálcico (Bioinsecticidas)					X								X			
4	Aplicación de Extractos de ajo, locoto y otros (Bioinsecticidas)							X				X					
5	Aplicación de Caldo ceniza (Bioinsecticidas)									X						X	
6	Deshierbe y podas de invierno					X		X									
7	Riego tecnificado (Goteo y por gravedad)					X		X		X	X	X	X	X	X	X	X

7C3. Manejo Apiarío en Tarata.

Año apícola	VALLES	YUNGAS
Enero	Control y seguimiento a las colmenas, colocado trampas de polen	No intervención por época de lluvias y/o control y alimentación de subsistencia
Febrero	Control y seguimiento a las colmenas, colocado trampas de polen	No intervención por época de lluvias y/o control y alimentación de subsistencia
Marzo	Control y seguimiento a las colmenas, colocado trampas de polen, posible división de colmenas.	No intervención por época de lluvias y/o control y alimentación de subsistencia
Abril	Segunda cosecha, aumentar alzas de ser necesario, preparar núcleos para traslado a zonas húmedas.	Preparación y limpieza del terreno
Mayo	Preparar núcleos para traslado a yungas.	Instalación, alimentación de núcleos
Junio	No intervención por época fría / y control y alimentación de subsistencia	Instalación, alimentación de núcleos, aumentar ceras y alzas.
Julio	No intervención por época fría / y control y alimentación de subsistencia	Instalación, alimentación de núcleos, aumentar ceras y alzas.
Agosto	Alimentación estimulante (3 veces por mes), renovación de material	Primera cosecha, división de colmenas, primer traslado de colmenas a valles.
Septiembre	Seguimiento, colocado de trampas de polen, alimentación, aumentar ceras y alzas	Seguimiento a la división de colmenas, aumento de ceras y alzas
Octubre	Seguimiento, colocado de trampas de polen, alimentación, aumentar ceras y alzas	Segunda cosecha, división de colmenas, traslado de colmenas a Valles.
Noviembre	Primera cosecha, aumentar alza de ser necesario	Segunda cosecha, división de colmenas, traslado de colmenas a Valles.
Diciembre	Control y seguimiento de colmenas.	No intervención por época de lluvias y/o control y alimentación de subsistencia

8. Annex 8 – Exclusion List

We completed the exclusion list by responding 'Yes' if the activity is included in the project and 'No' if the project does not include the activity.

Activities	Included in Project ('Yes' or 'No')
Any project activities leading to or requiring the destruction [1] of critical habitat [2] or any forestry project which does not implement a plan for improvement and/or sustainable management.	No
Any activity which could be associated with the significant impairment of areas particularly worthy of protection of cultural heritage (without adequate compensation in accordance with international standards).	No
Trade in animals, plants or any natural products not complying with the provisions of the CITES/Washington convention [3].	No
Destructive fishing methods or drift net fishing with a net more than 2.5 km in length, explosives and/or poison.	No
Large-scale commercial logging operations for use in primary tropical moist forest.	No
Production or trade in wood or other forestry products other than from sustainably managed forests [4].	No
Exploitation of diamond mines and marketing of diamonds where the host country has not adhered to the Kimberley Process.	No
Activities involving harmful or exploitative forms of forced labour [5] or harmful child labour [6].	No
Projects that include involuntary physical displacement and/or forced eviction.	No
Production or activities that encroach on lands owned, or claimed or occupied by Indigenous Peoples, without full documented consent of such peoples.	No
Production, use, sale or trade of pharmaceuticals, pesticides/herbicides, ozone layer depleting substances [7], and other toxic [8] or dangerous materials such as asbestos or products containing PCB's [9], wildlife or products regulated under CITES, including all products that are banned or are being progressively phased out internationally	No
Production or trade of arms, ammunition, weaponry, controversial weapons, or components thereof (e.g., nuclear weapons and radioactive ammunition, biological and chemical weapons of mass destruction, cluster bombs, anti - personnel mines, enriched uranium).	No
Procurement and use of firearms.	No
Provision of finances to military institutions involved in conservation or security activities.	No
Production or trade of strong alcohol intended for human consumption or other alcoholic beverages (excluding beer and wine).	No
Production or trade of tobacco and other drugs	No
Gambling, gaming establishments, casinos or any equivalent enterprises and undertaking [10].	No
Any trade related to pornography or prostitution.	No
Production or trade in radioactive material. This does not apply to the procurement of medical equipment, quality control equipment or other	No

application for which the radioactive source is insignificant and/or adequately shielded	
Production or trade in unbound asbestos. This does not apply to the purchase or use of cement linings with bound asbestos and an asbestos content of less than 20%.	No
Production, trade, storage, or transport of significant volumes of hazardous chemicals, or commercial scale usage of hazardous chemicals. Hazardous chemicals include gasoline, kerosene, and other petroleum products.	No
Transboundary trade in wastes, except for those accepted by the Basel Convention and its underlying regulations [11].	No
Any activity leading to an irreversible modification or significant displacement of an element of culturally critical heritage [12].	No
Production and distribution, or investment in, media that are racist, antidemocratic or that advocate discrimination against a part of the population.	No
Projects involving the planting or introduction of invasive species	No
Projects that increase the dependency of primary participants and other stakeholders on fossil fuels.	No

Notes:

[1] Destruction means (1) the elimination or severe reduction in the integrity of a habitat/area caused by a major and long-term/prolonged change in land-use or water resources or (2) the modification of a habitat such that this habitat's ability to fulfil its function/ role is lost.

[2] The term critical habitat encompasses natural and modified habitats that deserve particular attention. This term includes (1) spaces with high biodiversity value as defined in the IUCN's classification criteria, including, in particular, habitats required for the survival of endangered species as defined by the IUCN's red list of threatened species or by any national legislation; (2) spaces with a particular importance for endemic species or whose geographical range is limited; (3) critical sites for the survival of migratory species; (4) spaces welcoming a significant number of individuals from congregatory species; (5) spaces presenting unique assemblages of species or containing species which are associated according to key evolution processes or which fulfil key ecosystem services; (6) and territories with socially, economically or culturally significant biodiversity for local communities. Primary forests or high conservation value forests must also be considered as critical habitats

[3] <https://cites.org/eng/disc/text.php>

[4] Sustainably managed forests are forests managed in a way that balances ecological, economic and socio-cultural needs.

[5] Forced labour means all work or service, not voluntarily performed, that is extracted from an individual under threat of force or penalty.

[6] Harmful child labour means the employment of children that is economically exploitive, or is likely to be hazardous to, or to interfere with, the child's education, or to be harmful to the child's health, or physical, mental, spiritual, moral, or social development. Employees must be at least 14 years of age, as defined in the ILO's Declaration on the Fundamental Principles and Rights at Work (C138 – Minimum Age Convention, Article 2), unless local laws require compulsory school attendance or a minimum working age. In such circumstances, the highest age requirement must be used.

[7] Any chemical component which reacts with, and destroys, the stratospheric ozone layer leading to the formation of holes in this layer. The Montreal Protocol lists Ozone Depleting Substances (ODS), their reduction targets and deadlines for phasing them out

[8] Including substances included under the Rotterdam Convention, Stockholm Convention and WHO "Pharmaceuticals: Restrictions in Use and Availability".

[9] PCBs (polychlorinated biphenyls) are a group of highly toxic chemical products that may be found in oil-filled electrical transformers, capacitors and switchgear dating from 1950 to 1985.

[10] Any direct financing of these projects or activities involving them (for example, a hotel including a casino). Urban improvement plans which could subsequently incorporate such projects are not affected.

[11] Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their disposal (1989).

[12] "Critical cultural heritage" is considered as any heritage element recognised internationally or nationally as being of historical, social and/or cultural interest.

9. Annex 9 - Environmental and Social Screening Report

We completed the template below with details of the environmental and social screening:

SECTION A: PROJECT INFORMATION				
Project title:	BOLITREES: QUECHUA MEDICINAL HERBS AND (AGRO)FORESTRY IN THE CENTRAL BOLIVIAN ANDES			
Project coordinator:	Climate Lab & Misk'i Kausay			
Country:	Bolivia			
Geography/ landscape:	Interandean valley			
Project summary:	The project initial aim is to work with two Quechua communities in the inter-Andean valley of Cochabamba to restore patches of degraded slopes. The project aims for organic growth, by including more and more interested Quechua communities in the future.			
Name and role of project coordinator staff member filling this questionnaire:	Claudio Vasquez, Misk'i Kausay Sil Lanckriet, Climate Lab			
SECTION B: POTENTIAL E&S RISKS AND IMPACTS				
Topic	Question	Project coordinator response	E&S reviewer comments	Project response
Vulnerable Groups	Are there vulnerable or disadvantaged groups or individuals, including people with disabilities (consider also landless groups, lower income groups less able to cope with livelihood shocks/ stresses) in the project area, and are their livelihood conditions well understood by the project?	There are lower income groups (e.g. syndicates of farmers with few cows and/or less than 1ha of cropland), though their livelihood conditions are surveyed during PDD phase	Agree	Ok
	Is there a risk that project activities disproportionately affect vulnerable groups, due to their vulnerability status?	Possibly, if lower income groups would be underrepresented during decision-making events at syndicate meetings	Agree	Ok

	Is there a risk that the project discriminates against vulnerable groups, for example regarding access to project services or benefits and decision-making?	No, vulnerable groups are included in the participatory consultations (§2.5 of the PDD).	Agree	Ok
E&S reviewer conclusions Estimated likelihood of risks (1-5) & justification: 3 Estimated magnitude of risks (1-5) & justification: 3 Risk significance: <i>Moderate</i>				
Gender equality	Is there a risk of adverse gender impacts due to the project/ project activities, including for example discrimination or creation/exacerbation or perpetuation of gender-related inequalities?	Possibly, if a perpetuation of gender-related inequality occurs, e.g. when women would be underrepresented during decision-making events at syndicate meetings	Agree	Ok
	Is there a risk that project activities will result in adverse impacts on the situation of women or girls, including their rights and livelihoods? Consider for example where access restrictions disproportionately affect women and girls due to their roles and positions in accessing environmental goods and services?	No, women are included in the participatory consultations, encouraged through joint partnership with CETM (§2.5 of the PDD)	Agree	Ok
	Is there a risk that project activities could cause or contribute to gender-based violence, including risks of sexual exploitation, sexual abuse or sexual harassment (SEAH)?	No, this is illegal and the partner organizations have an ethical charter that safeguards against this.	Agree	Ok

	Consider partner and collaborating partner organizations and policies they have in place. Please describe.			
E&S reviewer conclusions Estimated likelihood of risks (1-5) & justification: 3 Estimated magnitude of risks (1-5) & justification: 2 Risk significance: <i>Moderate</i>				
Human Rights	Is there a risk that the project prevents peoples from fulfilling their economic or social rights, such as the right to life, the right to self-determination, cultural survival, health, work, water and adequate standard of living?	No, this is illegal and the partner organizations have an ethical charter that safeguards against this.	Agree	Ok
	Is there a risk that the project prevents peoples from enjoying their procedural rights, for example through exclusion of individuals or groups from participating in decisions affecting them?	Possibly, if vulnerable individuals would not be present during decision-making by syndicate meetings	Agree	Ok
	Are you aware of any severe human rights violations linked to project partners in the last 5 years?	No, there are no such violations linked to the project partners and the partner organizations have an ethical charter that safeguards against this.	Check at validation	Ok
E&S reviewer conclusions Estimated likelihood of risks (1-5) & justification: 2 Estimated magnitude of risks (1-5) & justification: 2 Risk significance: <i>Low</i>				

Community, Health, Safety & Security	Is there a risk of exacerbating existing social and stakeholder conflicts through the implementation of project activities? Consider for example existing conflicts over land or natural resources, between communities and the state.	Possibly, given the disputes around exotic species plantations	Agree	Ok
	Does the project provide support (technical, material, financial) to law enforcement activities? Consider support to government agencies and to Community Rangers or members conducting monitoring and patrolling. If so, is there a risk that these activities will harm communities or personnel involved in monitoring and patrolling?	No, the project does not support law enforcement activities in any way.	Agree	Ok
	Are there any other activities that could adversely affect community health and safety? Consider for example exacerbating human-wildlife conflict, affecting provisioning of ecosystem services, and transmission of diseases.	No, this is illegal and the partner organizations have an ethical charter that safeguards against this.	This doesn't quite answer the question. Are there any unintended consequences that might happen as a result of wider project activities? For example, say you were using fertilisers for agroforestry which then may run off into nearby streams and rivers.	There could be an increased risks for bee stings by increased apiculture activities.
E&S reviewer conclusions Estimated likelihood of risks (1-5) & justification: 3 Estimated magnitude of risks (1-5) & justification: 3 Risk significance: <i>Moderate</i>				

Labour and working conditions	Is there a risk that the project, including project partners, would lead to working conditions for project workers ¹ that are not aligned with national labour laws or the International Labor Organization's (ILO) Declaration on the Fundamental Principles and Rights at Work (discriminatory working conditions, lack of equal opportunity, lack of clear employment terms, failure to prevent harassment or exploitation, failure to ensure freedom of association etc.)?	No risk, as the project will at all times align with national labour laws	Agree	Ok
	Is there an occupational health and safety risk to project workers while completing project activities?	No, none of the tasks (raising seedlings and planting trees) is dangerous in any way.	Please could you add another sentence here around hazards such as manual handling, equipment, weather conditions etc.	Project workers make use of manual handling with basic equipment's, such as shovels and pickaxes, the occupational health and safety risk is low.
	Is there a risk that the project support or be linked to forced labour, harmful child labour, or any other damaging forms of labour?	No, this is illegal and the partner organizations have an ethical charter that safeguards against this.	Agree	Ok
E&S reviewer conclusions Estimated likelihood of risks (1-5) & justification: 1 Estimated magnitude of risks (1-5) & justification: 2 Risk significance: Low				

¹ Project workers include project coordinator staff, staff of other project partners, third party groups fulfilling core functions of the project, and community volunteers or contracted workers.

Resource efficiency, pollution, wastes, chemicals and GHG emissions	Is there a risk that project activities might lead to releasing pollutants to the environment, cause significant amounts of waste or hazardous waste or materials?	No risk, as no pollutants are used	Agree	Ok
	Is there a risk that the project will lead to significant consumption of energy, water or other resources, or lead to significant increases of greenhouse gases?	No, project GHG emissions are negligible	More information required here. For example, consider the transport of seedlings, international travel, etc.	GHG emissions of the project activities are low and mainly related to local transport and international travel. The GHG emission risk is insignificant at project level.
E&S reviewer conclusions Estimated likelihood of risks (1-5) & justification: 1 Estimated magnitude of risks (1-5) & justification: 3 Risk significance: Low				
Access restrictions and livelihoods	Will the project include activities that could restrict peoples' access to land or natural resources where they have recognised rights (customary, and legal). Consider projects that introduce new access restrictions (eg. creation of a community forest), reinforce existing access restrictions (eg. improve management effectiveness and patrolling of a community forest), or alter the way that land and natural resource access restrictions are decided (eg. through introducing formal	Possibly, given the aim to restore patches of land that were affected by syndicate activity, although the project now involves these syndicates directly within the project and project agreement	Agree	Ok

	management such as co-management).			
	Is there a risk that the access restrictions introduced /reinforced/ altered by the project will negatively affect peoples' livelihoods?	No, the project does not impose access restrictions.	Agree	Ok
	Have strategies to avoid, minimise and compensate for these negative impacts been identified and planned?	NA	More information required here. Given what you've mentioned above, how does the project plan to mitigate/minimise the risk of displaced degradation?	Leakage is considered insignificant. The monitoring of leakage and leakage mitigation measures are described in Annex 7, based on the approved PU004 methodology.
E&S reviewer conclusions Estimated likelihood of risks (1-5) & justification: 3 Estimated magnitude of risks (1-5) & justification: 3 Risk significance: <i>Moderate</i>				
Cultural heritage	Is the Project Area officially designated or proposed as a cultural site, including international and national designations?	No, the PA is not officially designated (nor proposed) as a cultural site.	Check at validation	Ok
	Does the project site potentially include important physical cultural resources, including burial sites and monuments, or natural features or resources of cultural significance (eg. sacred sites and species, ceremonial areas) and is there risk that the project will negatively impact this cultural heritage?	No, the PA does not contain any sacred sites and species, nor ceremonial areas.	Check at validation	Ok

	Is there a risk that the project will negatively impact intangible cultural heritage? Consider for example cultural practices, social and cultural norms in relation to land and natural resources.	No, the project works with Quechua groups and wants to reinforce the Quechua heritage.	Agree	Ok
E&S reviewer conclusions Estimated likelihood of risks (1-5) & justification: 1 Estimated magnitude of risks (1-5) & justification: 2 Risk significance: Low				
Indigenous Peoples	Are there Indigenous Peoples ² living within the Project Area, using the land or natural resources within the project area, or with claims to land or territory within the Project Area?	Yes, all participants are Quechua and may insist on their cultural traditions.	More information required here. It's noted in the PDD that the Mestizos are not technically indigenous. How does this group interact with the Quechua in terms of power dynamics, decision making etc?	As mentioned in the PDD the project does not distinguish Mestizos. All project participants are Quechua.
	Is there a risk that the project negatively affects Indigenous Peoples through economic displacement, negatively affects their rights (including right to FPIC), their self-determination, or any other social or cultural impacts?	No, the project works with Quechua groups and wants to reinforce the Quechua heritage.	Agree	Ok
	Is there a risk that there is inadequate consultation of	Possibly, if the Quechua traditions would not be	Agree	Ok

² As per the IUCN Environmental and Social Management System, Indigenous Peoples include: "(i) peoples who identify themselves as "indigenous" in strict sense; (ii) tribal peoples whose social, cultural, and economic conditions distinguish them from other sections of the national community, and whose status is regulated wholly or partially by their own customs or traditions or by special laws or regulations; and (iii) traditional peoples not necessarily called indigenous or tribal but who share the same characteristics of social, cultural, and economic conditions that distinguish them from other sections of the national community, whose status is regulated wholly or partially by their own customs or traditions, and whose livelihoods are closely connected to ecosystems and their goods and services" (IUCN 2016).

	Indigenous Peoples, and/or that the project does not seek the FPIC of Indigenous Peoples, for example leading to lack of benefits or inappropriate activities?	involved nor respected in the project		
E&S reviewer conclusions Estimated likelihood of risks (1-5) & justification: 1 Estimated magnitude of risks (1-5) & justification: 3 Risk significance: Low				
Biodiversity and sustainable use of natural resources	Is there a risk that project activities will cause adverse impacts on biodiversity (both in areas of high biodiversity value, and outside of these areas) or the functioning of ecosystems? Consider issues such as use of pesticides, construction, fencing, disturbance etc.	No, the project will not use pesticides and starts from a baseline of bushy grasslands.	Agree	Ok
	Is there a risk that the project will introduce non-native species or invasive species?	Possibly, since several fruit trees are not native to Bolivia (nevertheless these are "naturalized")	Agree	Ok
	Is there a risk that the project will lead to the unsustainable use of natural resources? Consider for example projects promoting value chains and natural resource-based livelihoods.	No, since all fruit trees are naturalized	Agree	Ok
E&S reviewer conclusions Estimated likelihood of risks (1-5) & justification: 1 Estimated magnitude of risks (1-5) & justification: 2 Risk significance: Low				

Land tenure conflicts	Has the land tenure and use rights in the project area been assessed and understood?	Yes	Agree	Ok
	Is there a risk that project activities will exacerbate any existing land tenure conflicts, or lead to land tenure or use right conflicts?	Possibly, given the aim to restore patches of land that were affected by syndicate activity, although the project now involves these syndicates directly within the project and project agreement	Agree	Ok
E&S reviewer conclusions Estimated likelihood of risks (1-5) & justification: 3 Estimated magnitude of risks (1-5) & justification: 3 Risk significance: <i>Moderate</i>				
Risk of not accounting for climate change	Have trends in climate variability in the project areas been assessed and understood?	Yes	Agree	Ok
	Has the climate vulnerability of communities and particular social groups been assessed and understood?	Yes	Agree	Ok
	Is there a risk that climate variability and changes might influence the effectiveness of project activities (eg. undermine project-supported livelihood activities) or increase community exposure to climate variation and hazards? Consider floods, droughts, wildfires, landslides, cyclones, etc.	Possibly, given the predicted vulnerability of the Bolivian Andes to hydroclimatic and glacier changes	Agree	Ok
E&S reviewer conclusions Estimated likelihood of risks (1-5) & justification: 1				

Estimated magnitude of risks (1-5) & justification: 3 Risk significance: <i>Low</i>				
Other – eg. cumulative impacts	Is there a risk that the project will contribute cumulatively to existing environmental or social risks or impacts, for example through introducing new access restrictions in a landscape with existing restrictions and limited land availability?	No, the project will not impose any access restrictions	Agree	Ok
	Are there any other environmental and social risks worthy of note that are not covered by the topics and questions above?	Possibly, there may be the risk of displacement of degradation towards adjacent areas (addressed in the techspec as leakage risk)	Agree	Ok
E&S reviewer conclusions Estimated likelihood of risks (1-5) & justification: 2 Estimated magnitude of risks (1-5) & justification: 3 Risk significance: <i>Moderate</i>				
SECTION C: SAFEGUARD PROVISIONS				
Stakeholder engagement	Has a stakeholder analysis been conducted that has identified all stakeholders that could influence or be affected by the project, or is this still to be completed? Please describe.	Stakeholder analysis was conducted, see §2.1	Agree	Ok
	Are the local community and indigenous peoples statutory or customary rights to land or resources within the project area already clear and documented, or is further assessment required? Please describe.	Yes, all project lands were cleared by INRA, see §1.2.2	Agree	Ok

	Are local governance structures and decision-making processes described and understood (including details of the involvement of women and marginalized or vulnerable groups), or is further assessment required? Please describe.	Yes, the project governance structure is based on the “agrarian syndicate”, see §1.2.2	Agree	Ok
	Are past or ongoing disputes over land or resources in the project area known and documented, or is there need for further assessment? Please describe.	Yes, we refer to §2.1.3 of the PDD: Disputed Land or Resources	Agree	Ok
Stakeholder consultation	Does the project have a Stakeholder Engagement Plan with clear measures to engage Vulnerable Groups, or is this plan still to be developed? Please describe.	Yes, we refer to § 2.5.2 of the PDD: Stakeholder Engagement Plan	Agree	Ok
	Has the Project Coordinator informed all stakeholders of the project, through providing relevant project information in an accessible format, or does this still need to be completed? Please describe.	Yes, we refer to § 2.6.2 of the PDD: FPIC Process	Agree	Ok
Free, Prior and Informed Consent	Has the project analysed and understood national and international requirements for Free Prior and Informed Consent (FPIC)? Please describe.	Yes, we refer to § 2.6.2 of the PDD: FPIC Process	Agree	Ok
	Has the project identified potential FPIC rightsholders and	Yes, we refer to § 2.6.2 of the PDD: FPIC Process	Agree	Ok

	potential representatives in local communities and among indigenous peoples, or is this still to be completed? Please describe.			
	Has the project worked with rightsholders and representatives of local communities and indigenous peoples to understand the local decision-making process and timeline (ensuring involvement of women and vulnerable groups), or is this still to be completed? Please describe.	Yes, we refer to § 2.6.2 of the PDD: FPIC Process	Agree	ok
	Has the project sought consent from communities to 'consider the proposed Project', and if so, where is this in principle consent documented? Please describe.	Yes, we refer to § 2.6.2 of the PDD: FPIC Process	Agree	Ok
Grievance Mechanism	Does the project already have a Grievance Mechanism, or is this still to be established? Please describe.	Yes, we refer to § 3.17 of the PDD: Grievance Mechanism	Agree	Ok
	For projects with a GRM, is this accessible to project affected people? Please describe.	Yes, we refer to § 3.17 of the PDD: Grievance Mechanism	Agree	Ok
E&S reviewer conclusions for safeguard provisions Are the project Safeguard Provisions adequately addressed, or to be adequately addressed during the project design phase? <i>Adequately addressed</i> What additional actions need to be conducted during the project design phase? <i>See comments below</i> Any other comments: <i>See comments below</i>				
SECTION D: SCREENING REPORT (E&S REVIEWER TO COMPLETE)				
Name of E&S reviewer	Hamish McGill, Eva Schoof (supporting)			
Date of E&S screening:	26/06/2023			

Project risk rating:	Low to Moderate Risk				
Principle risks and impacts	Include summary of key project risks & impacts Populate summary table with risk significance				
	E&S topic/ risk area	Likelihood (1-5)	Magnitude (1-5)	Significance (low, moderate, severe, high)	
	Vulnerable Groups	3	3	Moderate	
	Gender equality	3	2	Moderate	
	Human Rights	2	2	Low	
	Community, Health, Safety & Security	3	3	Moderate	
	Labour and working conditions	1	2	Low	
	Resource efficiency, pollution, wastes, chemicals and GHG emissions	1	3	Low	
	Access restrictions and livelihoods	3	3	Moderate	
	Cultural heritage	1	2	Low	
	Indigenous Peoples	1	3	Low	
	Biodiversity and sustainable use of natural resources	1	2	Low	
	Land tenure conflicts	3	3	Moderate	
	Risk of not accounting for climate change	1	3	Low	
	Other – eg. cumulative impacts	2	3	Moderate	
E&S assessment required	Assessment required for: - Indigenous groups – power dynamics (between Quechua and Mestizos); how to ensure traditional practices are respected by the project? - Land tenure conflicts with syndicate (competition for groundwater, allocation of fertile soils, shareholder land patches, etc). Focus stakeholder discussions on how to reduce risks of land tenure conflicts; how can potential conflicts be mitigated? - Displaced degradation - Check for any risks with non-naturalised species (apple, peach – assumed to be ok, but good to state that these are required for livelihood needs and are not exotic/invasive/competition for native species) In the PDD – list all low/moderate risks in the PDD with a mitigation/avoidance strategy For risks above (for assessment):				

	- In PDD – identify mitigation strategies by providing evidence of further consultation in the field	
Likely safeguard plans required	- Stakeholder engagement/consultation - FPIC on any activities to reduce any potential risks on access restrictions - Robust grievance mechanism	-

10. Annex 10 – Environmental and Social Assessment Report

Annex 10a: Risk Assessment and ESMP

Method

In September 2023, communal meetings on risks were held in Izata (Tarata) jointly with the community of Tunasani and Yanaruni. Using the Plan Vivo template, the main risk areas were discussed and mitigation measures were in common decided if relevant.



Photograph of communal risks session in Tarata

1. COMMUNITY-LEVEL RISK ASSESSMENT THROUGH COMMUNITY DISCUSSIONS

Key areas of risk	Community discussion on the importance of risk?	Measures to reduce this risk?
Vulnerable groups: How do you assess the potential costs and benefits and how to ensure representation of vulnerable groups and the poor throughout project design and development? How to avoid the capture of the local elite?	There is a small risk that vulnerable community members would be underrepresented.	One of the roles of the project <i>directorío</i> is to ensure project equality. Therefore, all decisions must be fully transparently reported in the <i>libro de actos</i> .
Gender equality: How to assess the potential costs and benefits and ensure women's representation throughout project design and development?	Traditionally there is an equal division of tasks at household and community level, which will also be respected for project activities. Note that women often manage the household finances. Women participate in community meetings and have the legal right to involve in the decision-making process. Yet, there is a risk that women are “not heard”, because they are less used to actively participate in the community discussions.	To change the position of woman in the community councils, woman representatives are <i>under rotation</i> invited to follow “Bartolina” trainings. In these trainings they learn how to interact in the community meetings and express their concerns. During the meeting “bartolinas” represent the woman voice and over time through rotation more woman will learn to actively participate.
Human Rights: How do you assess the risk that the project prevents people from enjoying their procedural rights, for example through exclusion of individuals or groups from participating in decisions affecting them?	Not seen as a risk the community ensures and respects human rights of all community members.	
Community, Health, Safety and Security: How do you assess the risk of exacerbating conflict within the region: social conflict or ethnic conflict?	Not seen as a risk, all community members are Quechua.	

Labor and working conditions: How to assess the occupational health and safety risk to project workers while completing project activities?	Not seen as a risk, all community members are smallholder farmers used to work in the field.	
Project GHG emissions: how to assess the risk that the project will lead to significant increase of GHG, water or other resources?	Not seen as a risk – on the contrary the community are well aware of the importance of ecosystem restoration for restoring the ecosystem services of “madre tierra”.	
Access restrictions and livelihoods: How to assess the potential costs and benefits of access restrictions (in proposed plantation areas)?	In the past this could have been a significant risk, because livestock densities were higher and agricultural activities were more widespread in the area. To date, the risk is considered low because: the project activities are conducted on remote lands, livestock densities are much lower at present and it is not allowed for livestock to graze in sown lands.	To avoid negative impacts of access restriction, all decisions are made at the community meetings in consensus with the community members.
Cultural Heritage: does the project site potentially include important physical cultural resources?	Not seen as a risk, there are now cultural heritage sites included.	
Indigenous peoples: clarify the situation of indigenous peoples within the project area, and the project should assess whether customs may at any time be in conflict with project activities	Perhaps if the Quechua traditions would not be respected.	The project works closely with the community and respects the traditional Quechua customs.
Biodiversity: is there risk that the project will introduce non-native species or invasive species?	Not seen as a risk because the project will plant native woodlands (and not invasive species) and fruit species that are naturalised over 500 years.	The project will not plant Pinus or Eucalyptus and will help in sensitising that planting these species is not recommended because of the allelopathic effects .

Land Tenure conflicts: How to assess the risk of conflict with neighbouring and neighbouring communities?	Since the area is located in a drought prone region, a potential conflict could arise around water use.	To avoid conflict, all water related activities must be approved by the sub-central, in which also the neighbouring communities are represented.
Risk of ignoring climate change: How to assess the potential impacts of extreme weather events on proposed activities?	The risk of intensified drought is considered very important.	The project should invest in water infrastructure jointly with the community at community scale.
How to assess fire risks? Risk of displaced grazing? Risk of escape? Plant diseases?	Slash and burn is not common in the project area, but human induced runaway fires can occur. The risk is considered low because the area is very low-populated and difficult to access.	The project will sensitise on the risk of fire at community level, because community members are working with fire in the area.
Other risks proposed?	The community raised the risk that late payments and untransparent financial transparency could cause a loss of interest and a feeling of financial abuse.	The project committed to full financial transparency and to provide annual financial reports.

2. COMMUNITY RISK MANAGEMENT PLAN

Environmental and social risks and impacts	Mitigation measures	Implementation?	When and whom?	Monitoring indicators? (if applicable)
How to protect vulnerable community members and avoid the dominance of a few individuals?	It is crucial to establish the <i>Project Directorio</i> as a governance structure. They are democratically elected by the community, during an annual (re)election, to follow-up on the project activities and at the same time to respect equality. Project Budget should also be considered (in part) as a community fund (equitable benefit-sharing). The community council will also meet monthly and oversee the project status.	Establishment of <i>project directorio</i> The allocation of Community funds must be part of the agroforestry agreement (minimum 10%)	2023, MK 2023, CL	P2
How to ensure women's representation throughout project design and development?	Ensure that women participate >30% in community meetings and encourage women to actively speak in the community meetings To change the position of women in the community councils, women representatives are under rotation invited to follow "Bartolina" trainings. Planting of shrubs and vegetables under the trees. We want to create a productive forest, not a woodlot. Medicinal shrubs and vegetables provide important resources for smallholder farmers on the short term.	Target: 30% Note women's participation in each meeting	Annually	P10
How to balance access restrictions (in proposed planting areas)?	The project areas are located in places with a low grazing pressure and in consensus with the community. We specify in the project agreement that all property rights explicitly remain the property of the owner.	Community consensus on project areas included	2023	P10
How to clarify the situation of the Quechua peoples in the project area, and how to assess the risk of conflict?	The project must work closely with the Quechua community. Traditional Quechua traditions must be respected. For example, every first Sunday of the month, a Pachamama ceremony is held. There is no risk of conflict since all community members are Quechua.	Respecting Quechua Pachamama	Monthly, MK	
Risk of introducing invasive or non-native species	The project will only plant native tree species in woodland forests and naturalized fruit species in mixed fruit orchards. The project will also sensitize on the negative impact of exotic species, such as Eucalyptus and Pinus, which are commonly planted in woodlots.	Nurturing and planting native forest species and naturalized fruit species	2023, MK	P6

Environmental and social risks and impacts	Mitigation measures	Implementation?	When and whom?	Monitoring indicators? (if applicable)
Risk of conflict with neighbors or neighboring communities?	The project must ask approval at sub-central level for all water related activities to avoid water conflicts with neighbouring communities. As for neighbours: Budget should also be considered (in part) as a community fund.	Sub-central approval of water-related activities The allocation of Community funds must be part of the agroforestry agreement	Annually 2023, CL	
Risk of ignoring climate change (cyclones, drought)	The project will provide technical capacity at planting stage, accurate planting is important for drought resistance in the first year. The project will jointly with the community invest in water infrastructure using the reinvestment budget (50% of the project budget)	Co-financed community reinvestment in water infrastructure	2024-2025, MK	P9
Risk of fire hazards	The community members are inducing fires. The project must sensitize on fire risks.	Community sensibilization	Annually, MK	
Other risks proposed?	Clear and transparent financial communication is required. The nurseries can also provide vegetables and shrub species. Training sessions on non-timber products are organized every year.	Transparent communication through annual financial reporting. Nurseries also raise vegetables and shrubs and the project provides community trainings	2024, CL 2024, MK	

Annex 10b: Certificate on the impact of the project



GOBIERNO AUTÓNOMO MUNICIPAL DE TARATA
DIRECCIÓN DE DESARROLLO PRODUCTIVO RECURSOS NATURALES
Y MEDIO AMBIENTE



Tarata, 15 diciembre del 2025

REF.: CERTIFICACIÓN SOBRE EL IMPACTO POSITIVO
DEL PROYECTO

De mi mayor consideración:

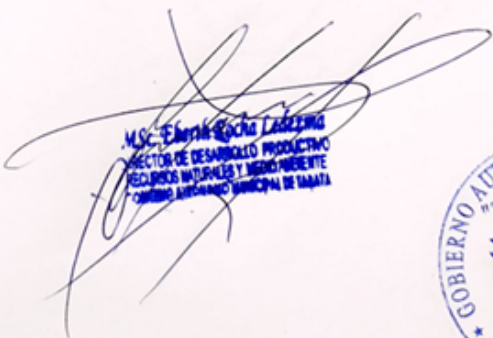
Declaro que para fines que sean necesarios. La Dirección de Desarrollo Productivo y Medio Ambiente del Gobierno Autónomo Municipal de Tarata, certifica que el proyecto:

**"HIERBAS MEDICINALES QUECHUAS Y (AGRO)
FORESTACIÓN EN LOS ANDES CENTRALES
BOLIVIANOS"**

Que se encuentra ubicado en el Departamento de Cochabamba, Provincia Esteban Arce, Municipio de Tarata, Subcentral Izata en las comunidades de Yana Rumi y Tunasani. Afecta de manera positiva en el municipio ya que aporta en la restauración de ecosistemas, sistemas agroforestales como en la producción forestal no maderable en las montañas bolivianas, aportando en los servicios ecosistémicos bajo la certificación de la Fundación Plan Vivo.

Por lo tanto, se emite la presente certificación de impacto positivo del proyecto "Hierbas medicinales Quechuas y (Agro) Forestación en los andes Centrales Bolivianos", en el municipio de Tarata.

En Cuanto se certifica para los fines consiguientes.



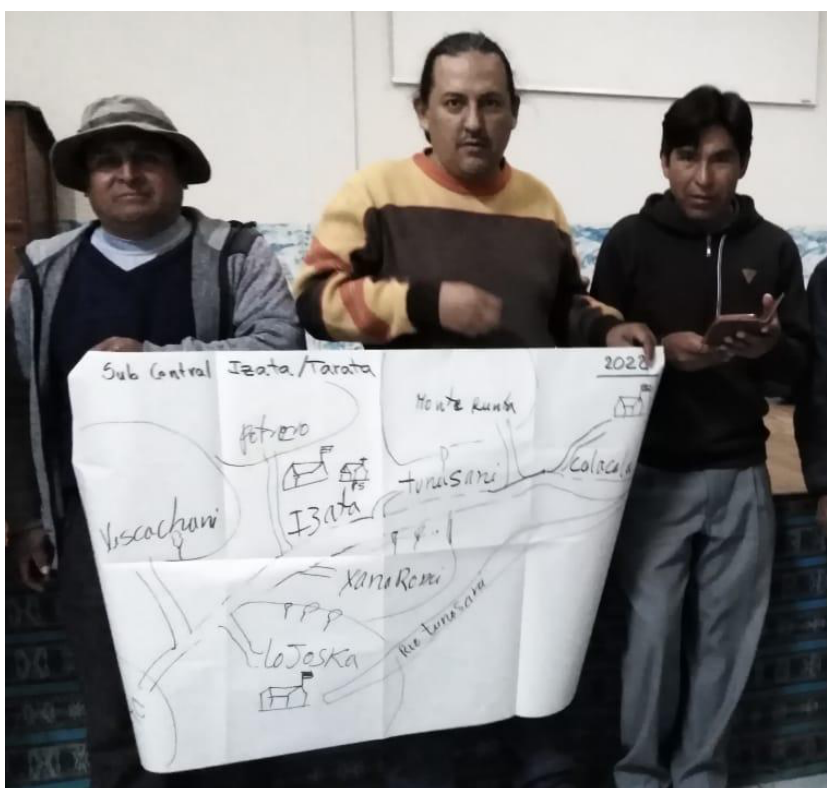
M.Sc. Efraim Roca Lázaro
DIRECCIÓN DE DESARROLLO PRODUCTIVO
RECURSOS NATURALES Y MEDIO AMBIENTE
GOBIERNO AUTÓNOMO MUNICIPAL DE TARATA



PROMOVRIENDO EL DESARROLLO Y LA CONSERVACIÓN DEL MEDIO AMBIENTE
Plaza Aroma, Acera Este S/N Tel: 4578727

11. Annex 11 – Land Management Plans

See examples below



12. Annex 12 – Project Agreements

13. Annex 13 – Monitoring Plan

14. Annex 14 – Project Database

-  1 Maps of project area
-  2 Map of leakage - not applicable
-  3 Proof of Land Tenure Ownership
-  4 Memorandum of Understanding
-  5 Forest Management Manual
-  6 Original planting or forest inventory data
-  7 Payment of Ecosystem Services Agreements
-  8 Records of PES payments
-  9 Biodiversity Database - if applicable
-  10 Documentation of community acceptance
-  11 Documentation of FPIC
-  12 Records of community participatory design activities
-  13 Documentation of involvement with local or national authorities
-  14 Carbon calculations model
-  15 Remote sensing SOPs for REDD projects - not applicable
-  16 Remote sensing results for REDD projects - not applicable
-  17 Project Database
-  18 Records of Grievance Mechanism
-  19 Records of Project Financial Accounts
-  20 Monitoring Manual
-  21 Socio-economic baseline scenario
-  22 All documents referenced in the PDD
-  23 Legal Documents

15. Annex 15 – Letter of Approval

Formal permit added in separate file.



ESTADO PLURINACIONAL DE BOLIVIA
MINISTERIO DE MEDIO AMBIENTE Y AGUA

Autoridad Plurinacional de la MADRE TIERRA

La Autoridad Plurinacional de la Madre Tierra (APMT), constituida en La Ley 300: Art. 53, como una entidad estratégica y autárquica de derecho público con autonomía de gestión administrativa, técnica y económica, bajo tuición del Ministerio de Medio Ambiente y Agua, otorga el presente:

Certificado de Registro

Proyecto: "Hierbas medicinales Quechuas y (Agro) Forestación en los andes Centrales Bolivianos"

CÓDIGO DE REGISTRO: N° APMT – MC – CR – 01/2025

El cual, mediante el Informe Técnico APMT/DMC/INF/0083/25 se procede al Registro del proyecto a la APMT, a través de la Dirección del Mecanismo Conjunto de Mitigación y Adaptación para el manejo integral y sustentable de los bosques y la Madre tierra, en el marco del Reglamento para Registro y Adscripción de Iniciativas, Proyectos y Programas en Cambio Climático ante la APMT, aprobado con Resolución Administrativa N° 012/2024 de la APMT, de fecha 01.03.2024.

Instancia de Implementación: Tarata, Tiraque - Cochabamba/ Bolitrees (Misk'i Kausay – Climate Lab)

Fecha de Registro: 28.04.2025

La Paz, 2 de junio de 2025

Angélica Ponce Chambi
DIRECTORA EJECUTIVA
AUTORIDAD PLURINACIONAL DE LA MADRE TIERRA



16. Annex 16 – Financial Plan

Financial Plan added in separate file.

17. Annex 17

Grievance flowchart in separate document.

