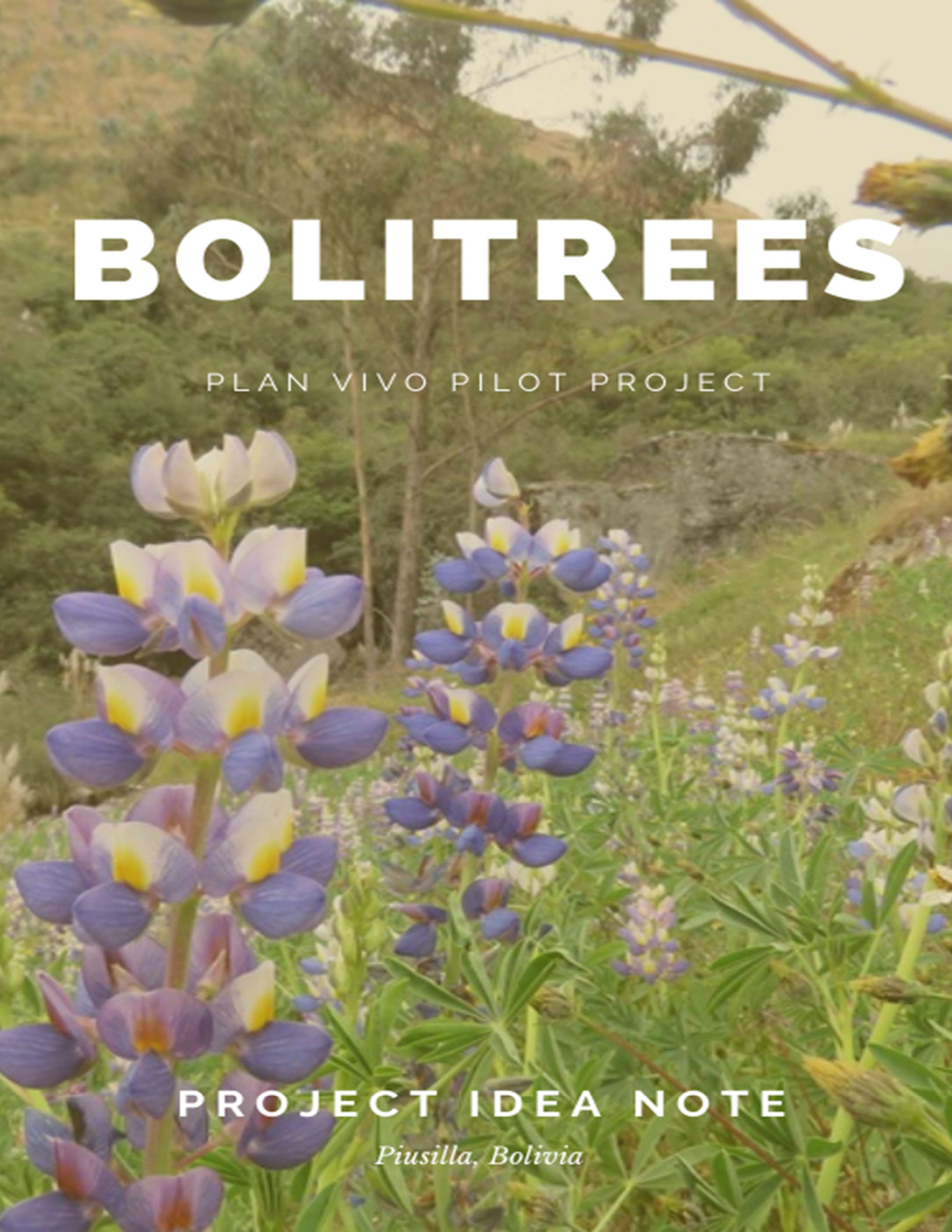

BOLITREES

PLAN VIVO PILOT PROJECT

PROJECT IDEA NOTE

Piusilla, Bolivia

REFORESTATION-BASED ECOSYSTEM RESTORATION

PLAN VIVO PILOT PROJECT

BOLIVIA

PROJECT IDEA NOTE

Prepared by

Project Title	Quechua medicinal herbs and (agro)forestry in the central Bolivian Andes
Date of Issue	
Prepared by	Climate Lab and Misk'i Mauskay
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Summary Information

Project Title	Quechua medicinal herbs and (agro)forestry in the central Bolivian Andes
Project Location – Country/Region/District	Bolivia, department of Cochabamba, centred around and starting from Sacaba, Tarata, Tiraque and Villa Rivero.
Project Coordinator & Contact Details	General coordinator: Climate Lab, bv info@climatelab.be; tel. +32 484988177 Local coordinator: Claudio Vázquez Salinas, Misk'i Kausay claudiovazquezsalinas@gmail.com, tel.:+591 72770290,
Summary of Proposed Activities (Max 30 words)	The project will support valorization of agroforestry products and medicinal plants to assist ecosystem restoration. Reforestation and sustainable agroforestry practices are key for environmental regeneration in the area.
Summary of Proposed Target Groups (Max 30 words)	In a joint effort with the agrarian unions of the communities, we will support smallholder farmers to tap into on-farm sustainable natural resources from agroforestry and medicinal plants.

Part A: Project aims and objectives

The project aims to restore the agroecological balance in the Quechua communities of the central Bolivian Andes, centered around Cochabamaba, by supporting woodland restoration and agroforestry. Particular aims are (i) to foster a shift towards agroforestry; (ii) to boost woodland ecosystem restoration on large and highly degraded slopes; (iii) to assist carbon storage in the supported woodlands through sustainable management, protection and enrichment planting and (iv) to increase natural ecosystem resources (medicinal and aromatic plants 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:

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

The project initial aim is to establish restored ecosystems across ca. 1000 hectares in Sacaba, Tarata, Tiraque and Villa Rivero. Over time the project area will be gradually extended to scale up the project impact.

Part B: Proposed Project Area

Description of Project Location

The project is located in the Cochabamba department of the Chapare province in central Bolivia in the municipalities of Sacaba, Tarata, Tiraque and Villa Rivero. Each Municipality is subdivided into different administrative districts called agrarian unions. The project will start at an area of about 1000 ha degraded land within four agrarian unions (Annex 1), and expand from there.

The project areas are under threat by expanding areas of wastelands and deforested areas, which push-back native forest cover and cause a depletion of soil and water resource. Furthermore, an increase in the

area of timber forestation with introduced species and deforestation at higher altitudes accelerate erosion and desertification at many agricultural and pastoral areas.

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 toxins released from the foliage). Under a eucalyptus forest, the cover and natural pastures disappear and on the other hand, the water sources dry up.

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". According to Müller et al. 2012, deforestation and land degradation the area is strong and connected to (1) expansion of mechanized agriculture, (2) growth of small-scale agriculture, and (3) expansion of cattle ranching to forest areas. Other drivers named by community members are the use of the timber for heating and cooking and the perspective that the forest has no value.

The natural forest vegetation provides important social and environmental services: reducing soil loss to erosion, caused by poor vegetation cover, increasing water availability and protect 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 deforestation, traditional agroecological knowledge is disappearing. There is a need for reviving traditional techniques and awareness 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 allow to reconnect with the traditional cultural society. For example, with the Covid-19 pandemic, medicinal plants – such as Wira Wira, Muña Muña, Chamomile and others – were reviving. A better understanding of the traditional socio-ecological and economic value, will allow to revalorize the natural ecosystem. There is a need to act now, before the traditional knowledge is lost together with the natural vegetation.

Description of Socio-Economic and Geographic Context

According to the 2012 census, the nearby village Piusilla counts 298 habitants. The population density is 61 persons per km^2. Around 55% of households have access to safe drinking water and 71% have access to electricity. To date, the smallholder plots are no longer sufficient for family subsistence, making it necessary to supplement income with migration to other productive spaces (PTDI, 216).

As in the entire Cochabamba valley, the mother language is Quechua, although due to the continuous relationship with urban centers, Spanish is incorporated as a second language. Quechua language and culture is particularly dominant in rural areas, while in urban areas, Spanish is the dominant language.

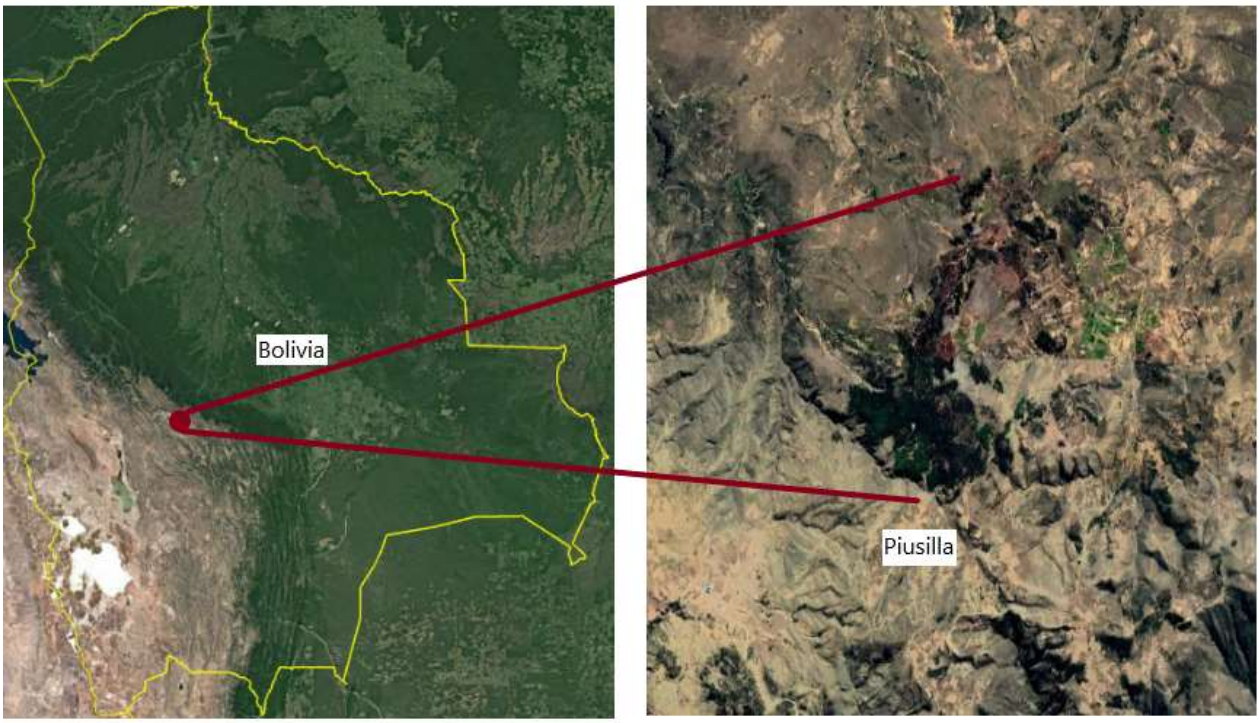


Figure 1: Map of Bolivia with a focus on Piusilla (source: Google Earth Pro, 2015).

The mean annual temperature in the area is 15˚C, with frost occurring between May and August and the highest ambient temperatures in November. The total average rainfall of around 650 mm per year spreads mainly over a period of five months with the highest rainfall during December and February (PTDI, 216).

The landscape is generally dominated by fluvial-lacustrine plains, with slopes between 0.5 and 2% and an altitude that varies between 2700 to 3900 m.a.s.l. The geology of this landscape is characterized by deep alluvial soils formed from sedimentation processes of the Quaternary period. Natural vegetation is made up of high altitude grasslands, deciduous scrubland, cardonales montanos, dry thorny forests and tropical yungas forest in the north (10 - 20 m).

However, to date, the natural dry forest is fragmented by agricultural and urban expansion and replaced by chaparral and scrub (maximum tree stratum of 4 to 10 meters respectively). It is undeniable that agricultural clearance and animal overgrazing has caused severe degradation.

Description of Ecological diversity

The region is characterised as an environmentally diverse area, because of its geographic location, located between the inner zones of the Andes and the eastern slopes of the Eastern Cordillera. This geographic characteristic has had a significant influence on the ecosystem of the region, differentiated mainly by altitudinal gradient and bioclimatic regime, which has given rise to the formation of eight altitudinal ecological levels (from premontane to sub-Andean). The project area comprises the premontane floor valleys that join the dry inter-Andean forests and the montane floor, characterized by the presence of dry and cardinal scrubland. In ecological terms, the area has a mesotropical xeric bioclimate. The xeric bioclimate is typical for the lower zone of the inter-Andean valleys with a dry ombrotype and an altitudinal variation that ranges from 2650 to 2800 m above sea level.

The predominant forest vegetation in the area consists of phreatophytic forests of the xerophytic montane floor (fig. 2). Semi-deciduous or seasonal evergreen forests that develop on river terraces, alluvial plains, piedmont glaciers and alluvial fans, 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. Characteristic species are: Schinus molle (molle), Prosopis alba (Tako), Lochroma australe (Seminole).

Figure 2. Illustration of (left): Schinus molle (Anacardiaceae); (right): Queña (Polylepis) indicator tree species in the project area.

Description of Smallholder Agriculture

Potato (*Solanum tuberosum*) is the main crop in all zones, but the crop rotations, planting dates and fallow periods differ substantially. In the *Miska* areas, potatoes are planted before the rainy season in May and harvested in November using irrigation, followed by a maize crop that is superseded by a one-year fallow period. In the *Wata Tarpuy* areas, potatoes are sown in the rainy season beginning in November, followed by forage oats and a fallow period of eight years. The size of landholdings ranges from 0.3 to 3.0 ha. Farmers also have access to communal land in the *Wata Tarpuy* for grazing and cultivation, the allocation of which is decided during village meetings. 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, poultry, and at the highest elevations, llamas.

Description of Deforestation

More generally, 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 CO_2 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 in what is known as the “expansion zone” towards other sites like Chapare.

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 in the province of Chapare, where the project holds seat. It lost 3.35 kha of tree cover, equivalent to 1.23Mt of CO_2 of emissions. Furthermore, this area has been classified with a high desertification index (NU. CEPAL, 2012). 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).

Description of Forestry Policy and Land Use

Although macroeconomic indicators improved in the nineties, poverty remained among rural Quechua people that depended on sluggish agriculture which had been negatively affected by trade liberalization and cutbacks in agricultural support (Pérez 2003). At this time, environmental and social difficulties encouraged the implementation of a "second-generation" plan to address environmental issues and improve public resource allocation. Furthermore, with the implementation of the National System of Protected Areas (Sistema Nacional de Areas Protegidas, SNAP) as well as the gradual establishment of protected areas, new institutional aspects emerged.

The legal framework and institutional structure remained intact a decade later, until Evo Morales, the leader of the Movement for Socialism (Movimiento al Socialismo, MAS), assumed power in 2006. This administration's policy agenda ended neoliberal development principles and introduced a new paradigm based on "Living Well" (Gobierno de Bolivia 2006). This concept for public administration was integrated into the State's new Political Constitution (CPE). It emphasizes, among other things, the Bolivian people's ownership of natural resources and the State's management of them; the recognition of citizens' social, economic, civil, and political rights (Müller et al., 2014).

The National Strategy of Forest and Climate Change was developed in 2010 (Müller et al., 2014). Its significance stems from the fact that it is the first time that the major role of forests is explicitly mentioned in government proposals, not only in climate change mitigation due to their contribution to carbon emissions, but also in local people's adaptation due to their ability to resist external changes. Forests were only included in national park policy after 2010. It is after 2010 that forests have been included in national proposals on climate change, which have become more relevant since COP 17 held in 2011.

Bolivia has made progress in the regularization of agricultural land. However, compliance with land-management systems and the growth of the agricultural frontier continue to be issued. The constant encroachment of private farms over woodlands is one of the major challenges. This is partly due to the government's incapacity to manage the spread of the Agricultural Frontier Law No. 337.

Similarly, due to the increased strain of the expanding agricultural border on smallholder farms and indigenous areas, national forest policies are sometimes out of step with local production methods. National regulations authorizing crop areas in these communities, as well as clearing plans, not always fit the circumstances. Despite the fact that unlawful timber harvesting continues, the regulations governing timber production management and monitoring need further adjustment, notably in storing facilities and rodeos (Müller et al., 2014).

The encroachment of the natural vegetation resulted in a mixture of land uses in the project areas which can be subdivided in three main clusters: agricultural parcels, wastelands and bushlands (fig. 3)

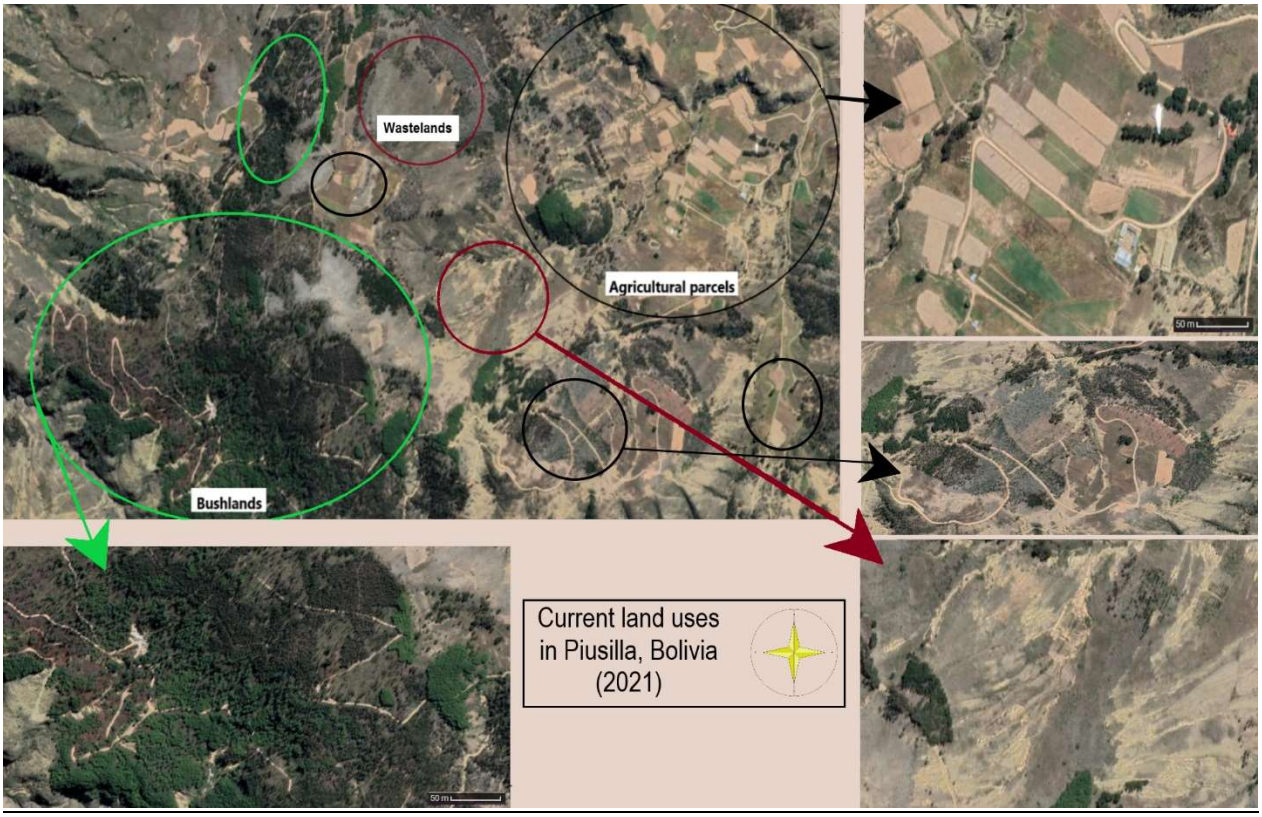


Figure 3: Example of land uses in Piusilla: bushland, wasteland and agricultural parcels (source: Google Earth, 2020).

Part C: Identification of Target Groups & Communities

Bolivia is one of the Latin American countries with the highest rural population, which reaches 40% of all citizens, who depend largely on smallholder agricultural activities for their subsistence (Morales, 2012).

To start, the project will work in close collaboration with households in the agrarian syndicates. During the first phase of awareness raising activities, acceptance, and participation of these communities in the project will be assessed and ensured by the coordinator.

The associations elect a representative through a democratic election. The members of the association are (under rotation) responsible to manage the general organization; and each family in their parcel will be able to extract ecosystem services that will include leaves production, water catchment, and medicinal plants. The project will provide free training on the optimal and sustainable use of these ecosystem services.

The traditional language in the project area is Quechua. Quechua is one of the 36 indigenous languages that are recognized as an official language of Bolivia. Although the large number of speakers of South Bolivian Quechua, the language is in danger of devaluing and encroachment from the “prestige” Spanish language.

South Bolivian Quechua is a member of the Southern branch of the Quechua language family, making it closely related to other Southern Quechua dialects including Ayacucho and particularly Cuzco Quechua, varieties which are both spoken in Peru. The Quechua language family spans an extremely diverse set of languages, many of which are mutually unintelligible, which is why linguists have classified Quechua as a language family as opposed to one language with many dialects. Though it is believed that all Quechuan languages descended from a single ancestor, Proto-Quechua.

There are still different Quechua traditions practiced in the project region. One of the most important is the monthly offer for the Andean Mother Earth (“Pachamama”) at the first Friday of every month. This offering (“Q’owa”) is to bless the coming month.

Quechua tradition also plays a prominent role in both preventive and curative health care. The traditional medicinal knowledge existed for thousands of years, and today they are often used in conjunction with modern medicine. In traditional Quechua medicine, natural medicinal plants are commonly used, such as Wira wira and Muña muña.

The highlands around Cochabamba have a high potential for forest restoration and regeneration with high environmental co-benefits, such as water infiltration, biodiversity increase, economic income from non-timber forest products (e.g. medicinal plants) or ecotourism services.

The project has good relations with the responsible authorities, which will ensure that necessary permissions and bylaws are agreed on, and that project benefits can be shared with the community and/or village entity.

Part D: Land Tenure & Carbon/ES Rights

Carbon rights

According to the provisions of articles 346 and 348 of the Political Constitution of the State of Bolivia, the ownership of carbon rights belongs to all Bolivian people. It is considered a natural heritage of public interest and of a strategic nature for the sustainable development of the country.

The Bolivian State approves a special regulation on the use of this natural resource, to be a subject to commercialization or voluntary compensation for the benefit of the owners of properties with forests or those located on forested lands (Law No. 300).

The definition of use and environmental functions established by Law No. 300, reads as follows:

"Use. It is the use of the products of the components of Mother Earth by individuals and collectives for integral development, for purposes of public and/or commercial interest, authorised by the Plurinational State of Bolivia, in harmony and balance with Mother Earth".

"Environmental Functions. It is the result of the interactions between the species of flora and fauna of the ecosystems, of their own dynamics, of the physical (or abiotic) space or environment, and of solar energy. Examples of environmental functions include the regulation of greenhouse gases among many others.

The legal ownership for rural land in Bolivia is governed by INRA ("Instituto Nacional de Reforma Agraria") for individuals or communities. All project areas are cleared by INRA for the communities.

Land Tenure

The agrarian unions 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). Agrarian syndicates are largely perceived to be managing community resources ranging from land, forests, and water to resolving conflict. The number of memberships in agrarian syndicates varies by municipality. An agrarian union is a social and productive organization managed by the community to regulate internal relations and external links. The usufruct rights of the land (incl. carbon storage) belong to the community.

The agrarian union does not have much to do with the labour 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).

It is characterized by:

- administration of justice according to the unwritten codes of tradition
- resolve land issues
- appointment of representatives by mandatory one-year shift.

In the agrarian union, the decisions are taken by communal assembly. Generally, the unions are grouped in sub-centers, which sometimes follow the cantonal boundaries. These sub-centers are in turn grouped into Centrals. A majority of the Centrals group the sub-centers of a province, but there are also Special Centrals, which do not have the political-geographical limits of the provinces.

The Centrals, which are currently more than 200 organized and active groups, are grouped by Federations. There are 9 departmental federations, 26 Regional or Special Federations, and some Nationals, all coming together in the Confederación Sindical Única de Trabajadores Campesinos de Bolivia, CSUTCB.

As a result of the decisive role that many women had played in various blockades, still at the time of dictatorship, the first women's unions started in 1977. On January 10, 1978, the firstNational Congress was

organised, from which the National Federation of Women emerged, as “Peasant Women from Bolivia” or "Bartolina Sisa" (FNMCB "BS") (Machicado, 2010).

Part E: Project Interventions & Activities

The project wants to implement the following interventions and activities over the duration of the total project period. All activities will follow upon community workshops to strengthen the partnership and community support.

(i) *Assisting the smallholder farmers of the agrarian union to establish tree nurseries and set-up and manage agroforestry plots (forest and fruit tree species interspersed with agricultural crops).*

The anticipated ecosystem balance between shrubs, trees, agriculture and domestic animals in the community is illustrated in figure 3 and provides an agro-silvo-pastoral alternative to the current deforestation and monoculture activities.

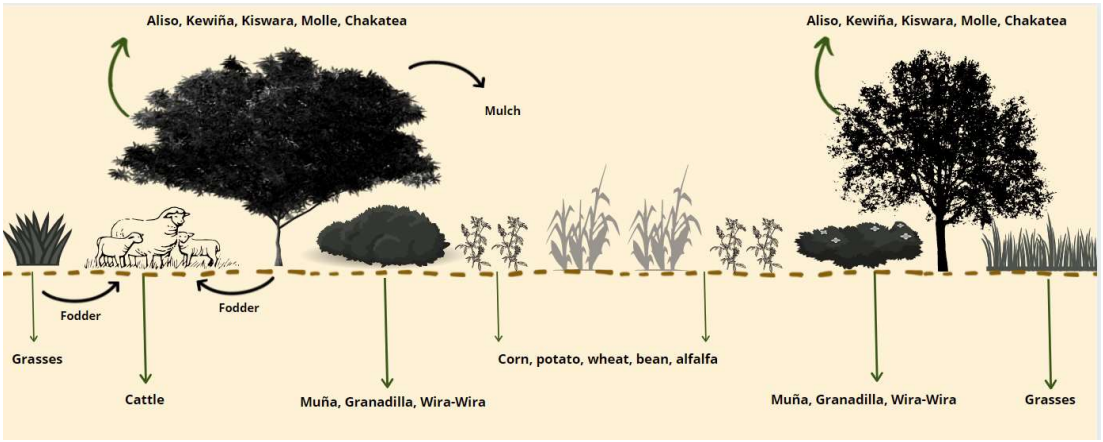


Figure 3: Species proposed for the area in the valley bottom and order of the crops.

Nurseries are established and/or existing nurseries are supported. Two types of nurseries will be constructed: forest tree nurseries for enrichment planting on the slopes and fruit tree nurseries for the agroforestry plots in the valleys.

By creating awareness 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.

(ii) *Tapping into the natural resources of the regenerating forest (non-timber forest products).*

Assisted growth of natural vegetation will boost the occurrence of native tree and bush species. Several of these native forest species hold fruits, such as fruits from Tara, Algarrobo and Queña. Other valuable non-timber forest products include 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. These are just some examples, the project aims to deepen the knowledge of traditional medicinal plants to create awareness and potential valorization. In any case, the project will involve at least the *Wira Wira, Muña Muña*, and Chamomile.

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

(iii) *Coordinating and supporting the farmers in maintaining the reforestation areas on the mountain slopes, including implementing soil conservation activities, rainwater, sustainably harvesting, and planting additional trees to further support the natural regeneration.*

The project will assist the natural regeneration of the endemic vegetation, through improved management and enrichment planting activities. The forest restoration areas will be 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 will be organized together with the municipality.

Tree seedlings are planted in November at the onset of the rain season. To plant the seedlings a soil opening of 30 by 30 cm is made, filled with light and fertile substrate and planted. Soil verticulation will stimulate water trapping around the seedling. In the dry season hydrogel can be added to enhance water availability for the tree seedling.

The project will provide trainings, and implement soil and water conservation activities, including, water reservoirs in natural depressions to harvest rainwater a traditional Quechua technique called “Qucha chapay”. There are several versions of traditional and modern water reservoirs, e.g. shortcuts or small lagoons waterproofed with clay; or geomembranes can also be placed; or circular ponds made with cement, stone, cement and iron.

The project will monitor biodiversity, including both flora and fauna.

Figure 4: Example of water reservoir in a neighboring community.

(iv) *Complying with the Plan Vivo model to guarantee the overall sustainability of the project*. The project will analyze baseline conditions in soil carbon and biomass carbon in different plots, and will regularly monitor soil and biomass carbon content in the project zones, along with monitoring of socio-economic conditions and biodiversity.

Part F: Identification of Any Non-Eligible Activities

As an additional, non-eligible activity, this project will support the development of different ecosystem services from two non-timber forest products provided by the medicinal bushes: leaves and branches. The project thus aims at showing local farmers that forests can have substantial value as compared to alternative land-use types.

- Firstly, the project will help the community to create rainwater harvesting techniques and grow trees and bushes.
- Secondly, the project will train the community to extract non-timber forest products (natural forest fruits, medicinal plants and apiculture products) sustainably.
- Thirdly, the project will help the community to bring the natural products to the most appropriate market.

The project will also support on-farm agroforestry activities. Both the sales of non-timber forest products and agroforestry products will be used to improve local farmers' household income status and create awareness on the value of natural ecosystem services.

Part G: Long-Term Sustainability Drivers

To ensure long-term sustainability, the project will support resilient agroforestry practices, apiculture, natural medicinal plant production and natural forest fruits. Reviving these Quechua knowledge and skills will create awareness on possibilities for valorization of ecosystem services. Plan Vivo credits will allow reinvestment in the project areas for the next 20 or 25 years.

The project will start around the four core areas around Cochabamba, but will expand "organically" over time (in neighboring zones with similar agroecological characteristics).

We refer the reader to "Part F: Identification of Any Non-Eligible Activities".

Part H: Application Organisation & Proposed Governance Structure

Climate Lab will act as the Plan Vivo 'project coordinator'. 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 fixed payments to producers; will coordinate and record monitoring; will negotiate sales of Plan vivo Certificates; will report to the Plan Vivo Foundation and will contract project validation and verification. Climate Lab will provide technical support, evaluate plan vivos and monitor plan vivos.

Misk'i Kausay is the local partner in Bolivia. Misk'i Kausay is a legal Bolivian association with expertise in agronomy, biology and environmental engineering and is experienced in Sustainable Development projects in Bolivia since 2007. Such as, among many others, "PLAN VIDA" a project of the Bolivian Ministry of Development Planning to strengthen the most vulnerable communities and families in Cochabamba and Potosí. One of the key objectives of Misk'i is sustainable ecosystem management and valorising of non-timber forest products through apiculture and agroforestry.

The project is thus a Belgian-Bolivian partnership aiming to promote ecosystem restoration, agroforestry and non-timber forest production in the Bolivian mountains, by supporting smallholder farmer communities.

The proposed project governance structure is schematized in Figure 3. The project "Quechua medicinal herbs and (agro)forestry in the central Bolivian Andes" is fostered by Climate Lab and Miski'i Kausay, along with interested farmers from the agrarian syndicate, in close cooperation with local authorities (syndicate and others). The 'daily' coordination of the project (including administration) is handled by the local coordinator Claudio Vazquez from Misk'i Kausay. He will work closely with the members of the agrarian syndicate, the municipalities and the Instituto Téchnologico Berto Nicoli. The Institute is a key partner for knowledge exchange and accessibility to research infrastructure. As stated above, the governance structure has been formalized in a Memorandum of Understanding between all relevant actors. The local coordinator will monitor the results throughout the project period.

Concerning ecosystem restoration activities, the local coordinator is responsible to:

- provide workshops and trainings on agroforestry, reforestation and forest management;
- actively search for areas that are suitable for improved restoration management, and ensure that the authorities, the farmers, and the farming associations agree with these activities;
- work using a community-driven approach, by fully taking into account the demands of the local farmers and population;
- purchase a variety of seedlings, and coordinate the improvement activities in the designated project zones;
- regularly monitor socio-economic conditions within the project zones, following the guidelines that have been provided (i.e. qualitative interviews and socio-economic survey).
- regularly monitor biodiversity, biomass, and soil organic carbon content within the project zones, following the guidelines that have been provided (i.e. sampling approach, biomass measurements, mixed soil sampling, and Walkley-Black analysis).

Concerning non-timber forest activities, the local coordinator is responsible to:

- provide training and consultancy on medicinal products and agroforestry to all interested individuals or entities requesting these services;
- actively be involved in setting up the rainwater harvesting by the farmers' syndicate, and check on the quality of the NTF products;

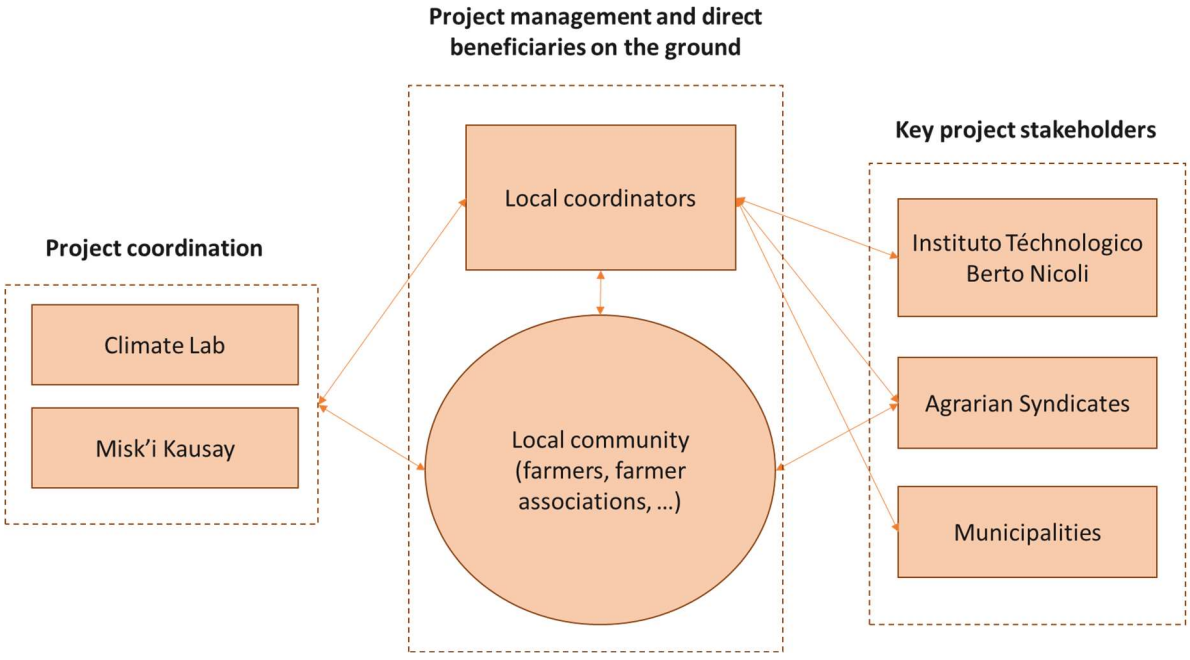


Figure 5: Schematized summary of the governance structure of the project "Agroforestry for and by a syndicate of farmers in the community of Piusilla (Bolivia)".

The carbon rights will be transferred to Climate Lab, who will subsequently be responsible for future sales of Plan Vivo certificates. A minimum payment will be allocated to the communities based on planting and management activities, independent of the revenues. If however, 60% of the net revenues exceeds the fixed payment scheme, the project will fund supplementary socioecological reinvestments.

Part I: Community-Led Design

Participation and acceptance by the local population are key to the successful management of the project. During the very first phase of the project activity, awareness and acceptance of target communities in the project will be ensured by performing community workshops and qualitative interviews in the project area. Issues raised during these consultation rounds will be incorporated in an improved project design.

As stated above, the participants of the agrarian union, consisting of families with their plots, will benefit from non-timber forest production. Every decision will be held through a democratic election. The members of the association will manage the plots and the non-timber agroforestry production. Gender equality within every association will have to be ensured. The members will be able to fully use the ecosystem services from the plots. All members of the associations will be trained in the Plan Vivo methodology by the project, and he/she will be trained to optimally manage a part of the community (enrichment planting of trees, soil and water conservation, medicinal plants cultivation, recollection). Regular discussion sessions, training sessions, and workshops will be organized together with the local coordinator, the local authorities.

Participation of women in the associations will be actively encouraged. Women's participation will be stimulated by organizing separate meetings with female association members where they can express their opinion separately and where they can prioritize their needs. These meetings will be organized before the establishment of 'plan vivos', to ensure that the needs of the female members are fully incorporated in the 'plan vivos'. Overall, the project aims to integrate gender equality into the project design.

Part J: Additionality Analysis

This project is not the product of a legislative decree, or a commercial land-use initiative likely to have been economically viable in its own right. Rather, the project provides the practical training, technical support, and incentives to develop agroforestry activities. Below we add a table with the most important barriers to project development, including the additionality under the combined project – Plan Vivo effort.

Table 1: Additionality of the combined EthioTrees – Plan Vivo effort.

Barrier	Baseline scenario	Additionality of the combined – Plan Vivo effort
Financial	- Limited funds - Other priorities - Limited private credit availabilities	Start-up capital secured; payment for ecosystems scheme supported by Plan Vivo
Technical	To date, technical knowledge on socio-economic 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 (socio-economic) ecosystem service valuation.
Institutional	- "Top-down approach", although the room is given for local initiatives - Rewarding for implementation activities	- Bottom-up approach with first consultation round continued workshops and benefits for farmers - Rewarding for implementation results - Strengthening the capacities of the unions.

Further additionality and spill-over effects of the project may include increased blue/green water availability for crops close or downstream to the forest area, erosion control, limited timber production, and non-timber forest production (medicinal plants).

Part K: Notification of Relevant Bodies & Regulations

The project works closely with the municipalities of Sacaba, Tarata and Tiraque in a shared effort to strengthen ecosystem restoration.

The project has a good collaboration with the government supported AICCA project (El Proyecto de Adaptación a los Impactos del Cambio Climático en Recursos Hídricos en los Andes (AICCA). AICCA also focusses on ecosystem restoration using native tree species.

The project is in contact with the Gobierno Autónomo Departamental de Cochabamba.

Part L: Start-up funding

The project can start independently, using approximately 20 000 euro of start-up funding

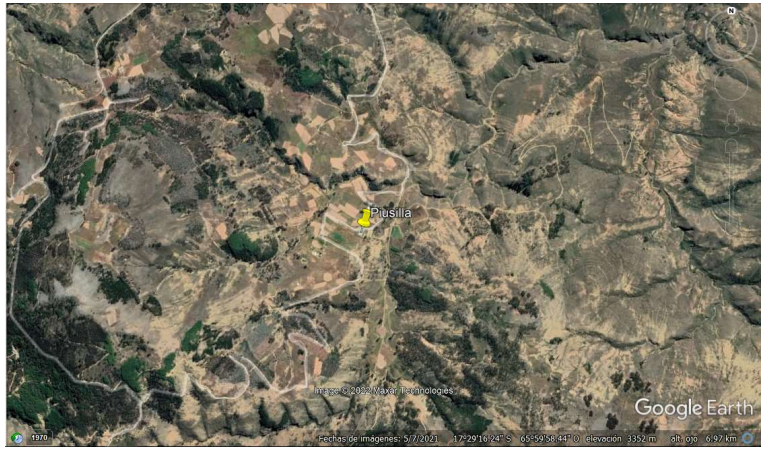
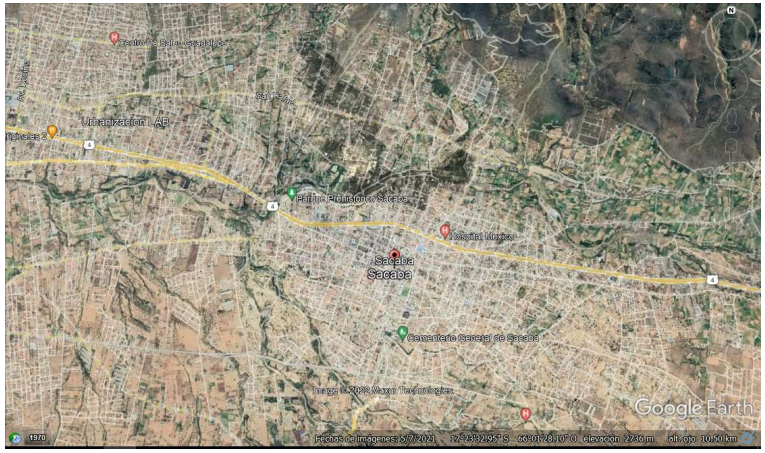
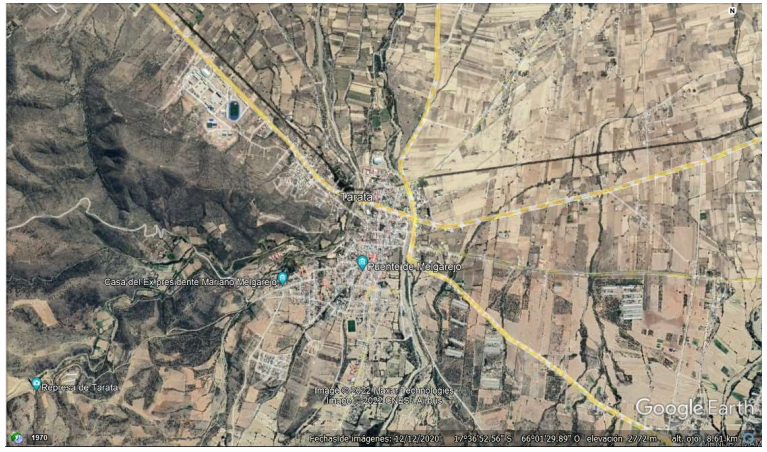
Appendices

Appendix 1: Project subarea summary

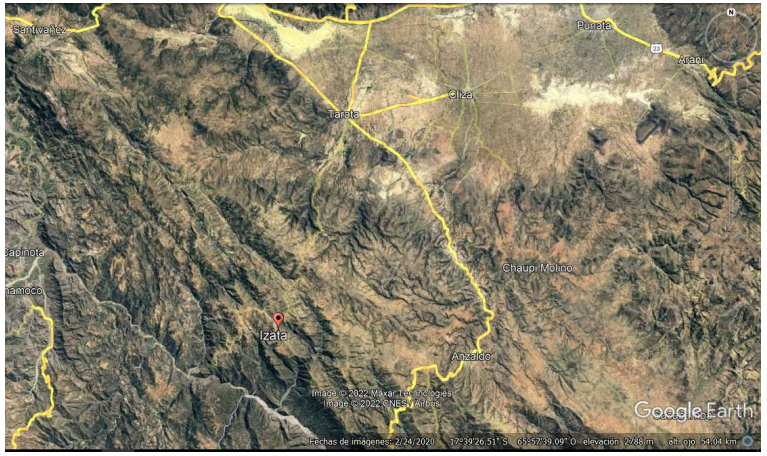
The project is located in the department of Cochabamba in central Bolivia, in the municipalities of Sacaba, Tarata, Tiraque and Villa Rivero. Each municipality is subdivided into different administrative districts called Communities (Agrarian Union). The project will start in an area of 1000 ha of degraded land within four Communities (Agrarian Union), and will expand from there.

Municipality	Agrarian Union	Central/ sub-central	Geographical description	Climate information	Type of vegetation
Sacaba	Piusilla	Lava Lava	Area is located at an altitude of 3400 m in the department of Cochabamba, municipality of Sacaba, between the Cordillera de Maso Cruz and the Cordillera de Tunari Coordinates of Sacaba: 17°24´16.15´´S, 66° 02´24.42´ W. Elevation 2714 m Piusilla Coordinates: 17°29.16.24'S, 65° 59.58.44'W. Elevation 3352 m	The average annual temperature in the area is 15°C, with frosts occurring between May and August and the highest ambient temperatures in November. The average total rainfall of around 650 mm per year extends mainly over a five-month period with the highest rainfall during December and February.	The predominant forest vegetation in the area consists of phreatophytic forests of the xerophytic montane soil. The characteristic species are: Schinus molle (molle), Prosopis alba (Tako), Lochroma australe (Seminole).

Tarata	Monte Punta, Tunazani, Izata, Cala Cala, Yana Rumi, Locjoska, Potrero, Tucma Viscachani	Izata	Coordinates of Izata: 17°45´14.01´´S, 66°04´21.89´´ W. Elevation 3214 m Tarata coordinates: 17°39´26.51´´S, 65°57´39.09´´ W Elevation 2788 m	Kewiña (Polylepis), Carob (Prosopis sp), Candelabra Cactus (Harrisia tetracontha), Molle (Schinus mole), Acacia (Acacipa sp.), Ceibo (Erytrina sp.), Jarca (Acacia visco), Willow (Salix sp.), Tara (Caesalpinia spinosa), Tipa (Tipuana tipa),
Tiraque	Q´Omer Q´Ocha	Q´Omer Q´Ocha	Coordinates Qomer Qhocha: 17°16'8.52"S, 65°42'14.78"W Elevation 3301 m Tiraque coordinates: 17°25'35.78"S, 65°43'26.71"W, Elevation 3311 m	Kewiña (Polylepis), Aliso (Alnus sp), Pino de monte (Podocarpus sp), Cedro (Cedrella sp.), Laurel (Ocotea jelskin), Nogal (Yuglans boliviana).
Villa Rivero	Manchay K'earu	District 1. Villa Rivero	Manchay K'uchu coordinates: 17°37'16.78"S, 65°48'12.70"W. Elevation 2863 m Villa Rivero Coordinates : 17°36'57.49"S, 65°48'41.51"W Elevation 2735 m	Carob (Prosopis sp), Candelabra Cactus (Harrisia tetracontha), Molle (Schinus mole),Acacia (Acacipa sp.), Ceibo (Erytrina sp.), Jarca (Acacia visco), Willow (Salix sp.), Tara (Caesalpinia spinosa), Tipa (Tipuana tipa),

Piusilla, Sacaba, Cochabamba.	Izata, Tarata, Cochabamba.
	
Coordinates of Piusilla: 17^{or}29.1 6. 24's, 65^{or} 59.58. 44' W. Elevation3,352 m	Coordinates of Izata: 17^{0}45´ 14.01´´ S, 66^{0}04´ 21.89´ W. Elevation 3214 m
	
Sacaba: 17^{or}24´ 16.15´´ S, 66^{or} 02´ 24.42´ W. Elevation 2714 m	Tarata coordinates: 17^{0}39´ 26.51´´ S, 65^{0}57´ 39.09´ W Elevation 2788 m

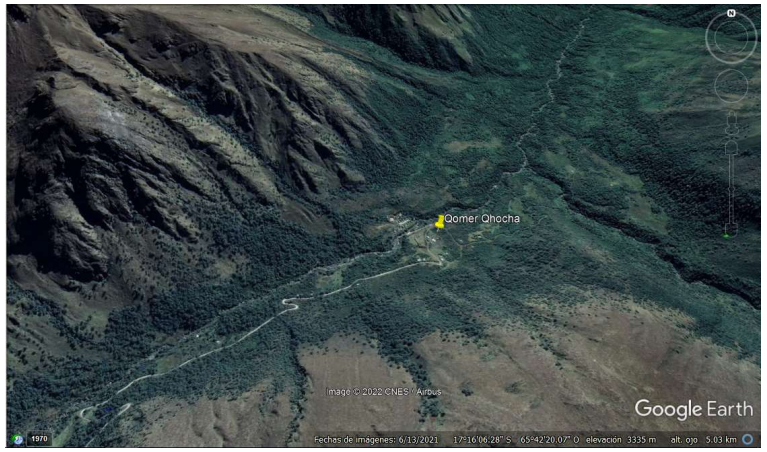
Sacaba to Piusilla Distance



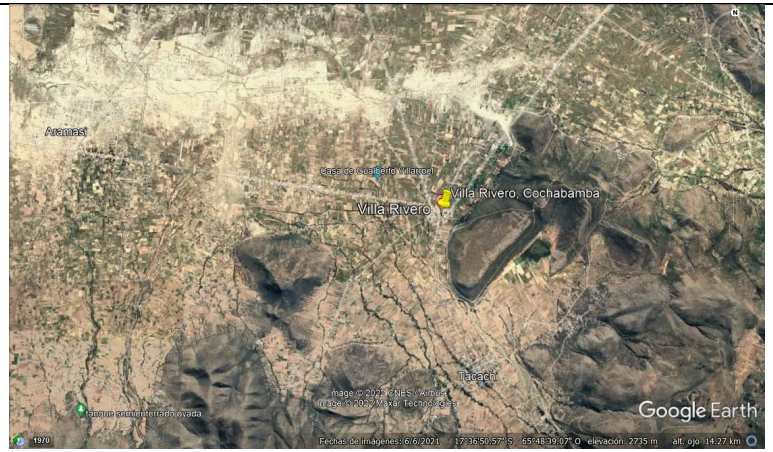
Tarifa to Izata Distance

Manchay K'uchu, Villa Rivero, Cochabamba.	Qomer Qhocha, Tiraque, Cochabamba.

Manchay K'uchu coordinates: 17°37'16.78"S, 65°48'12.70"W. Elevation 2863 m

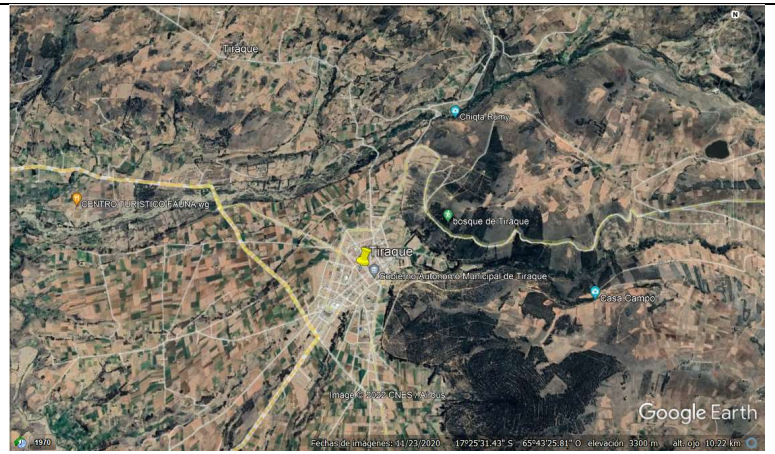


Coordinates Qomer Qhocha: 17°16'8.52"S, 65°42'14.78"The Elevation 3301 m



Villa Rivero Coordinates : 17°36'57.49"S, 65°48'41.51"O Elevation 2735 m

Manchay K'uchu to Villa Rivero Distance

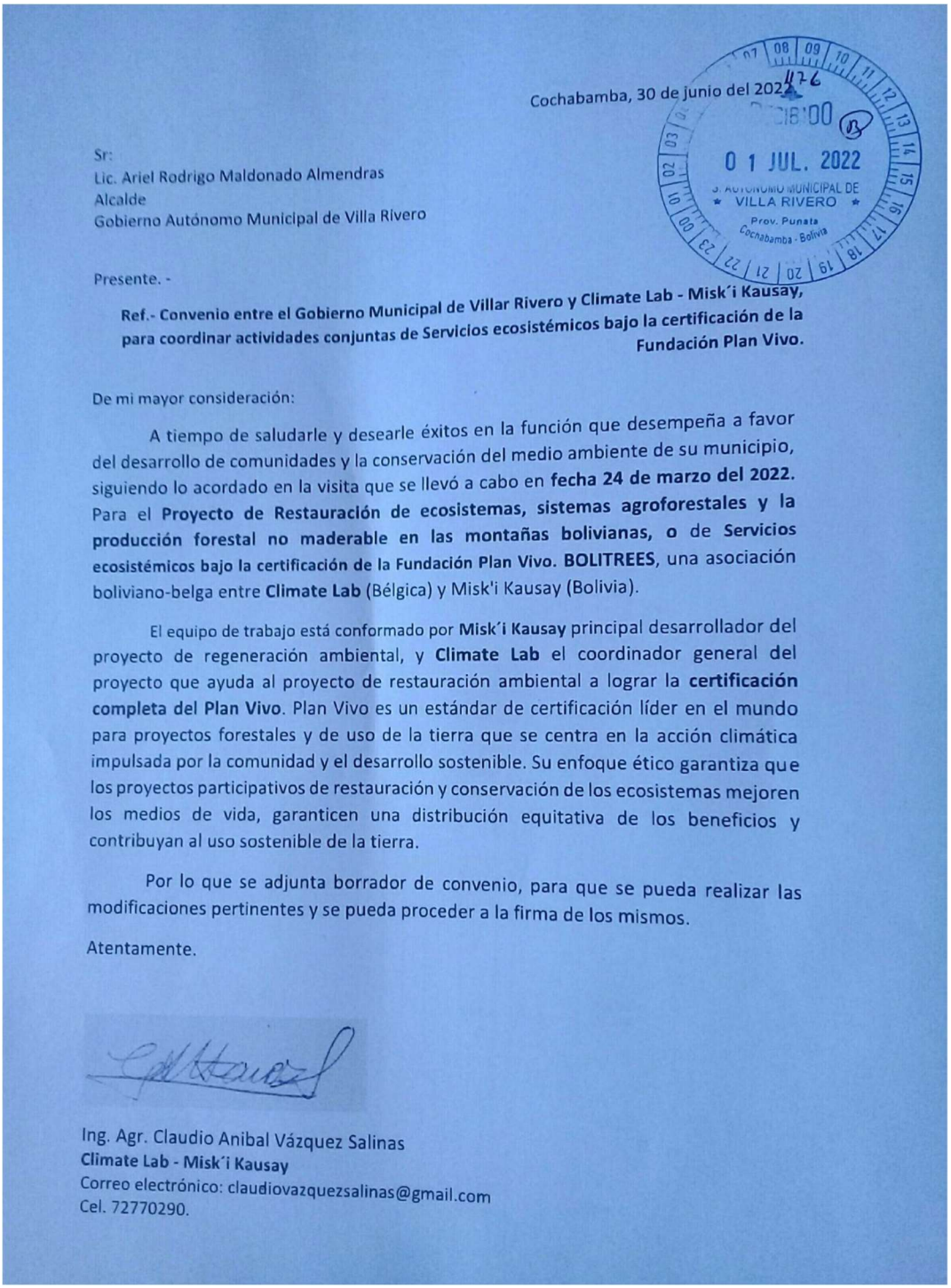


Tiraque coordinates: 17°25'35.78"S, 65°43'26.71"O Elevation 3311 m

Tiraque to Qomer Qhocha Distance

Project action area, 2022.

Appendix 2: Notification to Municipalities and Fonabosque



Cochabamba, 30 de junio del 2022

0 1 JUL. 2022
G. AUTÓNOMO MUNICIPAL DE
VILLA RIVERO
Prov. Punata
Cochabamba - Bolivia

Sr:
Lic. Ariel Rodrigo Maldonado Almendras
Alcalde
Gobierno Autónomo Municipal de Villa Rivero

Presente. -

Ref.- Convenio entre el Gobierno Municipal de Villar Rivero y Climate Lab - Misk´i Kausay, para coordinar actividades conjuntas de Servicios ecosistémicos bajo la certificación de la Fundación Plan Vivo.

De mi mayor consideración:

A tiempo de saludarle y desearle éxitos en la función que desempeña a favor del desarrollo de comunidades y la conservación del medio ambiente de su municipio, siguiendo lo acordado en la visita que se llevó a cabo en **fecha 24 de marzo del 2022.** Para el **Proyecto de Restauración de ecosistemas, sistemas agroforestales y la producción forestal no maderable en las montañas bolivianas, o** de **Servicios ecosistémicos bajo la certificación de la Fundación Plan Vivo. BOLITREES**, una asociación boliviano-belga entre **Climate Lab** (Bélgica) y Misk'i Kausay (Bolivia).

El equipo de trabajo está conformado por **Misk´i Kausay** principal desarrollador del proyecto de regeneración ambiental, y **Climate Lab** el coordinador general del proyecto que ayuda al proyecto de restauración ambiental a lograr la **certificación completa del Plan Vivo**. Plan Vivo es un estándar de certificación líder en el mundo para proyectos forestales y de uso de la tierra que se centra en la acción climática impulsada por la comunidad y el desarrollo sostenible. Su enfoque ético garantiza que los proyectos participativos de restauración y conservación de los ecosistemas mejoren los medios de vida, garanticen una distribución equitativa de los beneficios y contribuyan al uso sostenible de la tierra.

Por lo que se adjunta borrador de convenio, para que se pueda realizar las modificaciones pertinentes y se pueda proceder a la firma de los mismos.

Atentamente.

Ing. Agr. Claudio Anibal Vázquez Salinas
Climate Lab - Misk´i Kausay
Correo electrónico: claudiovazquezsalinas@gmail.com
Cel. 72770290.

Tarara, 24 de Enero de 2022

Nº CITE: CE/GAMT/076/2022

Señores:
Climate Lab

Presente.-

Ref. SOLICITUD DE PROGRAMACIÓN DE REUNIÓN Y PRESENTACIÓN DE PROYECTO

De mi mayor consideración:

A tiempo de saludarle y desearle éxitos en la función que desempeña a favor del desarrollo de las comunidades y la conservación del medio ambiente, es de conocimiento del Gobierno Autónomo Municipal de Tarata que su institución viene ejecutando el **Proyecto de restauración de ecosistemas, sistemas agroforestales y la producción forestal no maderera en las montañas bolivianas, con la Fundación Plan Vivo** en el departamento de Cochabamba, razón por la cual solicitamos una reunión para poder conocer con mayor detalle los alcances de su proyecto y como nuestro municipio puede participar del mismo.

Por lo que se pone a su consideración la fecha y hora para esta reunión según su disocian de tiempo, para una mejor coordinación favor comunicarse con el *MSc* Eberth Rocha Ledezma (71707604) Director de Desarrollo Productivo Recursos Naturales y Medio Ambiente del GAM Tarata. Sin otro particular y agradeciendo de antemano su atención me despido de su Autoridad con las consideraciones que el caso amerita.

Atentamente

Ing. Dario Fernando Vallejo Vargas
ALCALDE
GOBIERNO AUTONOMO MUNICIPAL DE TARATA

GOBIERNO AUTONOMO MUNICIPAL TARATA Prov. Esteban Arze (Bol. Vía) Cochabamba

"Sosten esta cabeza mía, que es la más pesada del mundo" Dr. José Quintín Mendoza

GOBIERNO AUTÓNOMO MUNICIPAL DE TIRAQUE

"PROVINCIA TIRAQUE"

Tiraque, 31 de enero del 2022

CITE: G.A.M.T. N° 33/2022

Señores:

CLIMATE LAB

Presente.-

REF.: CARTA DE INTERES EN TRABAJAR CON EL PROYECTO DE RESTAURACIÓN DE ECOSISTEMAS, SISTEMAS AGROFORESTALES Y LA PRODUCCIÓN FORESTAL NO MADERERA EN LAS MONTAÑAS BOLIVIANAS.

Reciban un saludo cordial

Conociendo la publicación realizada, me dirijo a ustedes muy respetuosamente para expresar mi interés de participar en él, **PROYECTO DE RESTAURACIÓN DE ECOSISTEMAS, SISTEMAS AGROFORESTALES Y LA PRODUCCIÓN FORESTAL NO MADERERA EN LAS MONTAÑAS BOLIVIANAS, CON LA FUNDACIÓN PLAN VIVO Y MUNICIPIO DE TIRAQUE**.

Sin otro asunto al que hacer referencia, me despido muy cordialmente.

Atentamente,

Nombre Completo: Elmer Rocha Guevara.
Cargo: Responsable Forestal (G.A.M-TIRAQUE)
Municipio: Tiraque
Provincia: Tiraque
Departamento: Cochabamba.
Celular: 77428804

Lic. Adolfo Mejida Flores
ALCALDE
Gob. Autónomo Municipal de Tiraque

GOBIERNO AUTONOMO MUNICIPAL
TIRAQUE
Cochabamba - Bolivia

ESTADO PLURINACIONAL DE
BOLIVIA

MINISTERIO DE
MEDIO AMBIENTE Y AGUA

ACTA DE REUNION

A horas 10:00 a.m. de fecha 01 de abril de 2022, en el Municipio de Tarata, Departamento de Cochabamba, se llevó a cabo reunión interinstitucional con participación de personal del Fondo Nacional de Desarrollo Forestal-FONABOSQUE y Miró Jacob en representación de CLIMATE LAB del País de Bélgica, con el objetivo de coordinar acciones conjuntas y gestión de recursos financieros para ejecución de proyectos de inversión en cumplimiento del Plan Estratégico Institucional de FONABOSQUE 2021-2025, con dichas acciones se coadyuva en el cumplimiento del Programa Nacional de Forestación y Reforestación – PNFR 2016-2030.

Adolfo Jesús
Director
Fonabosque

Miro Jacob
Climate Lab.

FONABOSQUE
FONDO NACIONAL DE DESARROLLO FORESTAL

Calle Almirante Grau Nro. 557 Piso 1, entre Calle Zoilo Flores y Boquerón, Zona San Pedro
Tel. :(591-2)2129838 – 2128772. Fax: (591-2)2128772 .www.fonabosque.gob.bo

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