

BIOCORRIDOR MARTIN SAGRADO REDD+ PROJECT

Project Design Document

Reduced Emissions from Deforestation and Forest Degradation
San Martin Department, Peru

*A Community Forestry Initiative for Carbon and Biodiversity Conservation and Poverty
Reduction*



Version 3.0 – January 2012

PROJECT DEVELOPER



TECHNICAL PARTNER
FOR IMPLEMENTATION



**PROJECT DESIGN DOCUMENT FOR REDUCING EMISSIONS FROM DEFORESTATION
AND FOREST DEGRADATION (REDD)**

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I. GENERAL INFORMATION

Location of the project

Country: Peru
Department: San Martin
Nearest City: Juan Jui, Provinces of Mariscal Caceres and Huallaga

Precise location of project activities: Located in the western part of San Martín Region of Peru, in the basin of Huayabamba river, the project area extends over 313 687 hectares, constituted by three land concessions with conservation purposes: Martin Sagrado, El Breo, Monte Cristo.
It is next to the Rio Abiseo National Park and Abiseo – Pajaten area.

Project Developer – Project Identification, Design, Monitoring, and Commercialization

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Pur Projet is the project developer, at the initiative of the REDD+ project. Pur Projet has been present in San Martin region and in the project zone since 2008, starting with the development of community reforestation programs. Pur Projet started the REDD+ project in 2010.

Local Implementing Organization

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The Fundacion Amazonia Viva, created at Pur Projet's initiative, and constituted by the different community associations involved in the project, is responsible for the local project coordination and technical coordination of field activities. (Note: The Fundacion Amazonia Viva was first created as "San Martin Verde", both names can still be found on communication material)

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II. EXECUTIVE SUMMARY

Historical Context

Peru has the third largest extent of tropical rainforests in the world, after Brazil and the Democratic Republic of Congo. These forests are some of the richest in the world, both in terms of biological diversity and natural resources (timber, energy, mineral resources).

Peruvian forests are under great pressure. About half of Peru is forested. Of this, more than 80 percent is classified as primary forest, the most biodiverse and carbon-dense form of forest. The FAO estimates that the country loses around 269 000 hectares of forest per year, giving it an annual deforestation rate of 0.4 percent (1990-2000). An estimated 3.1% of its forest cover or around 2,164,000 ha has already been lost between 1990 and 2000.



In contrast, during this same period the Department of San Martin, in the Amazon part, lost about 28% of its forested area (GRSM & IIAP, 2005). The actual rate of deforestation in the region is 40 ha per day. Most of this deforestation is the result of subsistence agriculture, which can largely be attributed to the migration of farmers from the highlands taking advantage of Peru's land-tenure law which allows people to own land by occupying it for five years.

Deforestation and degradation are also increasingly the result of development activities, especially logging, commercial agriculture, mining, gas and oil operations, and infrastructure construction.

A growing number of organizations in the department have been trying to protect the remaining natural forests as community forestry areas, but they all lack of financial means. Project sites include large tracts of healthy closed-canopy forests, as well as degraded forests suitable for restoration and assisted natural management.

TABLE 01: Peru Forest Figures

Forest area	
Total forest area, 2000	65,215,000 ha
% of land area	50.9%
Area per capita	2.6 ha
Forest plantations	640 000 ha
Forest cover change, 1990-2000	
Annual change in forest cover	-269 000 ha
Annual rate of change	-0.4%
Forest types, volumes and biomass	
Forest types (% of country's forest area)	Tropical 100%
Wood volume in forests	158 m ³ / ha, i.e. 10 304 million m ³ in total
Wood biomass in forests	245 tonnes / ha, i.e. 15 978 million tonnes in total

Number of tree species in IUCN	Red list
Number of native tree species	2,500
Critically endangered	33
Endangered	14
Vulnerable	54
International Conventions and	Agreements
Ratification as of 1 December 2004	CBD, UNFCCC, Kyoto Protocol, CCD, CITES, Ramsar Convention, World Heritage Convention

Source: State of the World's Forests, FAO, 2005

The “Biocorridor Martin Sagrado” REDD+ Project

The Biocorridor Martin Sagrado Project for Reducing Greenhouse Gas Emissions from Deforestation (“Biocorridor Martin Sagrado” REDD+ Project) aims to address deforestation and its resulting emission of greenhouse gases (GHG) in an area of the Department of San Martin, which is under great land use pressure. Its implementation is consistent with the ZEE strategy (Zonificación Económica Ecológica) planned and initiated by the Regional Government of San Martin to halt deforestation and promote sustainable development in San Martin, based on giving value to the environmental services provided by its standing forests (CDC_UNALM 2002,2003). The local legislation provides the entire legal framework necessary to implement REDD projects in the San Martin department.

The objectives of creating the “Biocorridor Martin Sagrado” project area were to protect forests with high conservation value while also improving the quality of life of the communities that live in these areas. The project seeks to maintain and increase carbon stocks in the area, preserve the hydrological cycle, as well as conserve biodiversity and endangered species. The project area completes a major role in the connectivity between the Abiseo River National Park and the “Bosque de Protección Alto Mayo”, part of the Conservation Corridor for Abiseo - Condor - Kutukú, considered as high priority for conservation and nucleus of one of the centers of high diversity (“Biodiversity hotspots”) in the Tropical Andes.

The creation and effective implementation of the project result from PUR PROJET, ACOPAGRO, and Fundación Amazonia Viva initiatives, with the objective to leverage a financial mechanism generating a financial compensation for activities reducing emissions from deforestation (REDD+). The project started in January 2010, as a complementary strategy to the Alto Huayabamba reforestation project, in which PUR PROJET and ACOPAGRO are committed since 2008, with a plan to replant more than 2,000,000 trees by 2013.

This Biocorridor Martin Sagrado project supports sustainable forest management, agro-forestry, non timber activities and livelihood development in the reserve by providing financing through carbon credits generated from forest protection and regeneration. The project will also create a 80-year income stream that will directly enhance household livelihoods and natural resource management capacity.

Carbon financing will be used to support rural communities to develop a range of livelihood activities including non-timber forest products (NTMP), improved agro-forestry activities and productivity intensification, community-based ecotourism infrastructure, micro-



credit and communication walkways development as well as other economic, social, cultural and environmental activities. The additional resources raised from the sale of these credits will allow the communities to implement all of the measures necessary to control and monitor deforestation within the project site, enforce the law, and improve the welfare of local communities

From the start of the project, mobilization of the community to protect forests has demonstrated effectiveness in halting deforestation and degradation in community forestry areas. ACOPAGRO and APAHUI members, and communities in the Huayabamba river basin have expressed strong interests in developing activities to better preserve their land and avoid deforestation. All of them have been consulted with regards to project design and objectives, and have been included in decision process. They have listed the projected activities they are wishing to develop with the support of Pur Projet. These activities have been prioritized and discussed with Fundacion Amazonia Viva and Pur Projet during the visits of the area. The project was designed through a transparent process involving participatory workshops and exterior consultations in order to guarantee the involvement and commitment of all the local stakeholders.

The project implementers will provide investors and donors with a guarantee that the execution and completion of the project will be done in a manner that complies with all of the relevant legal, governmental and regulatory structures.

The Amazonia Viva Foundation

The Amazonia Viva Foundation is a Peruvian non-profit foundation created at Pur Projet's initiative. It is constituted by the associations and cooperatives involved in reforestation and forest conservation projects in San Martin region. It is operated by an assembly of representatives from each member organization, and works with a management team responsible for planification of activities, daily coordination of activities, and management of funds.

Bringing together organizations and projects dedicated to the community preservation of forest in San Martin Region in Peru, the foundation has been created to support and coordinate the efforts of each organization, to reach a higher level of effectiveness and recognition. The San Martin Foundation is a way of increasing support from local, national and international authorities, and larger public or private funds to finance community activities for the preservation of the environment.

Within the scope of REDD+ project, the San Martin Foundation coordinates project activities with member organizations, implements a global scheme for project management and a prioritization of activities, and manages the allocation of funds. The Amazonia Viva Foundation is in charge of implicating every community in the project zone, through visits to communities with collection of data, feedback and suggestions, and organizations of regular general assemblies for all communities involved in the REDD+ project

Main objectives

- Preserve and protect the fragile ecosystems of the Peruvian Yungas in San Martin, on the watersheds and river basins, procurement sources for the local population and San Martin
- Protect wildlife, particularly vulnerable or endangered species
- Protect scenic or landscape heritage to promote economic activities, recreation and environmental education
- Preserve and ensure the continuous flow of environmental goods and services especially fixing greenhouse gases and water regulation

Secondary objectives

- Democratic participation of communities to the carbon credits sales, managing their community forests and creating conservation areas.
- Promote political cooperation at all levels of management: national government, regional and local to ensure adequate legal framework and the sustainability of long-term projects with economic results that encourage conservation and reforestation of the areas

Project activities

The project aims to prevent the deforestation through the implementation of the following categories of activities:

1. Legal: Formalization of project area will be conducted through the attribution, registration, and maintenance of concessions for conservation at regional government level, as well as registration at higher international level. In combination, financing of legal actions will help to fight illegal intrusions, encroachment and logging in the area. The project will also help developing forest management plans in a collaborative fashion. The project will support the communities in developing land and water resource development plans in a participatory and democratic manner by making improvements in the existing monitoring system managed by the local communities and by making large investments in the work of the environmental protection infrastructure and staff and the land titling agencies.

2. Control & Surveillance: Construction and maintenance of control points, demarcation of area boundaries, improvement of walkways, and patrolling/forest guarding are essential elements to effectively prevent uncontrolled deforestation. Also, increasing legitimacy of patrol groups and strengthening relationships with the local Forestry Administration will help creating a unified group of stakeholders that can prevent further forest encroachment, illegal logging, uncontrolled migration and other threats to forest integrity.

3. Sensibilization and Communication: Sensibilization of communities on conservation stakes will be done through local promoters, communication material, and implication of communities in the activities. Visits of the area will be conducted to raise awareness on forest's richness and environmental services. Education centres will be constructed to train and transmit scientific information to local communities in conservation efforts as well as to provide opportunities for the training of professionals specializing in biology, forest management, environmental education, etc.

4. Non timber forest valuation: community organization and training will be combined to improve the local capacity in forest management and forest product extraction such as seeds or medicinal plants. Research and development of new technologies will allow for innovation in the quality and types of products local communities produce. Furthermore, market development activities such as eco-tourism will be undertaken to improve market access. This combination should also enhance the production of forest products from the local communities involved in the project.

5. Scientific and Inventory: Inventories of biodiversity and carbon stocks will be conducted to improve knowledge on high conservation values species, on environmental services rendered by the forest in the whole region. Inventories will also contribute to monitoring of deforestation and conservation impacts on species conservation. Alongside, other scientific studies will investigate onsite the relationships between forest and water, food resources and food sovereignty, living conditions, wellbeing.

6. Renewable Energy: Even minor contributor, the development of renewable energy and equipment to lower fuelwood is a key component to make people aware of the need to develop alternative sources of energy.

7. Reforestation: Development in the buffer zone of the project area, where community lives, of agroforestry programs to plant native timber trees in the farmers parcels. This reforestation activity aims at lowering the pressure of agriculture on surrounding forest (yield increase), provide alternative source of fuelwood an timber to the communities, as well as raising communities awareness on forests. The project will build upon Pur Projet's experience in reforestation programs in the region. The project will also conduct Assisted Natural Regeneration within the project area to re-enrich degraded areas with native species.

8. Expansion, training and empowerment of communities: Empowerment of the communities on conservation, sustainable agriculture, resources management, and coordination with other neighbouring communities is very important to secure the sustainability of the project and limit leakage and risks from outside of the project area. It will help also promote the project in the whole region of San Martin.

GENERAL SECTION



III. GENERAL SECTION

G1. Original Conditions at the Project Site

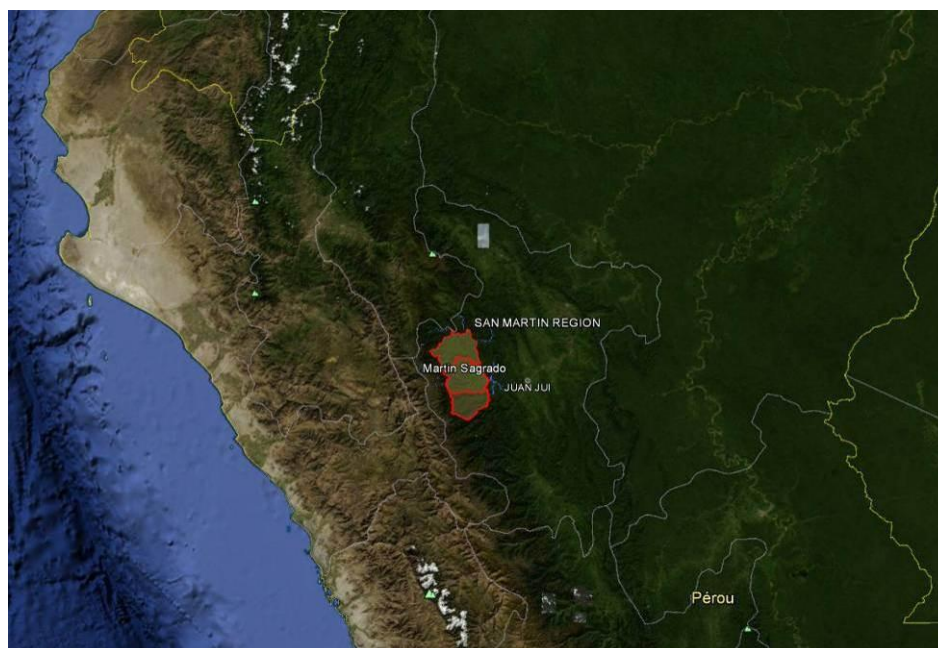
G1.1. Location of the Project and Basic Physical Parameters

G1.1.1 Location of the project

General location

The project is located in Northern Peru, in the western part of the San Martin province. The province of San Martin is located in the Amazonean Andes, tropical region of Peru at the transition between the high Andes and the lower Amazon basin. The Martin Sagrado project zone can be reached by boat the town of Juanjui (3 hours).

Figure 1 : General location of the project

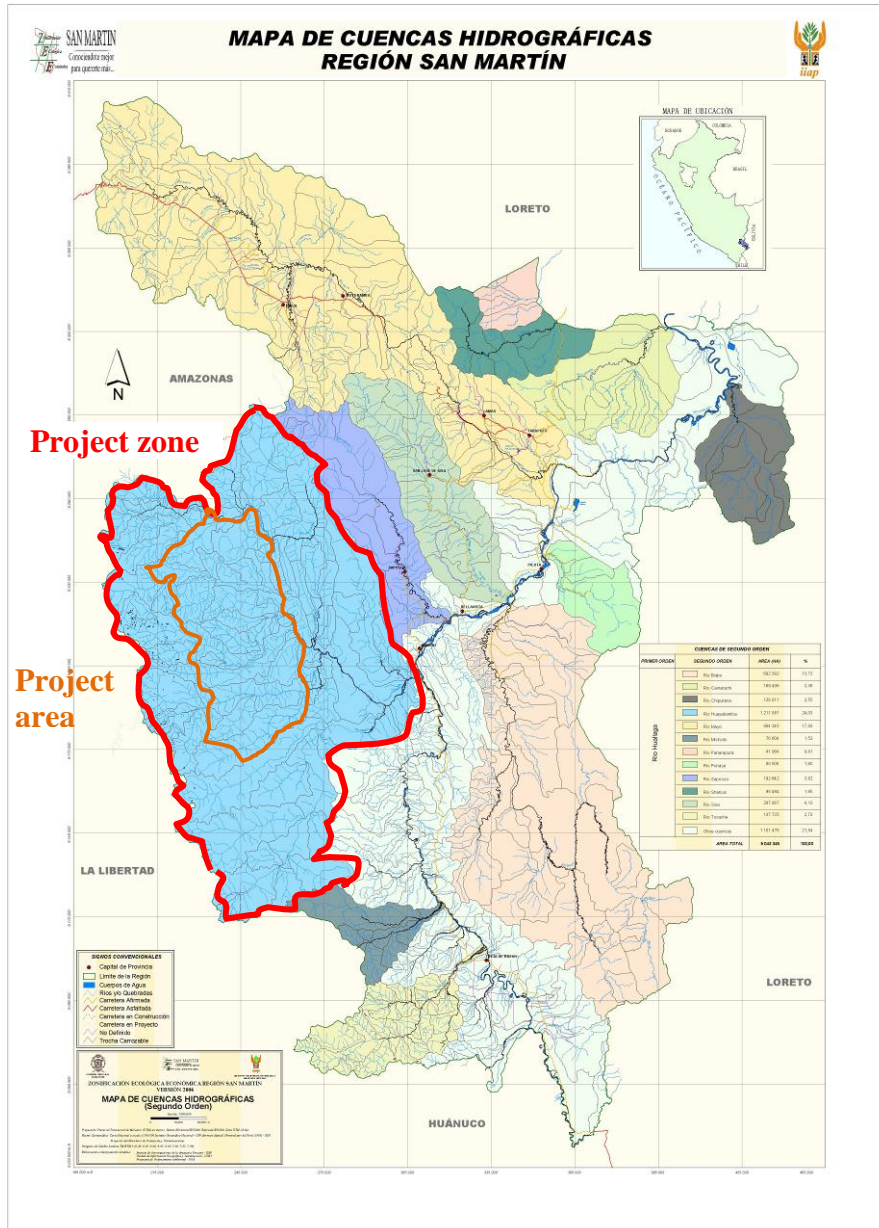


Project zone

The project zone is constituted by the river basin of the Huayabamba River, delimited on the Western and Northern side by the Andes and the frontier with Amazonas and La Libertad provinces, to the East by the hills chain between Huayabamba and Saposoa valleys, on the South East by the Huallaga river.

The project zone is relatively homogeneous in terms of climate, soils, vegetation, and socio-economic conditions.

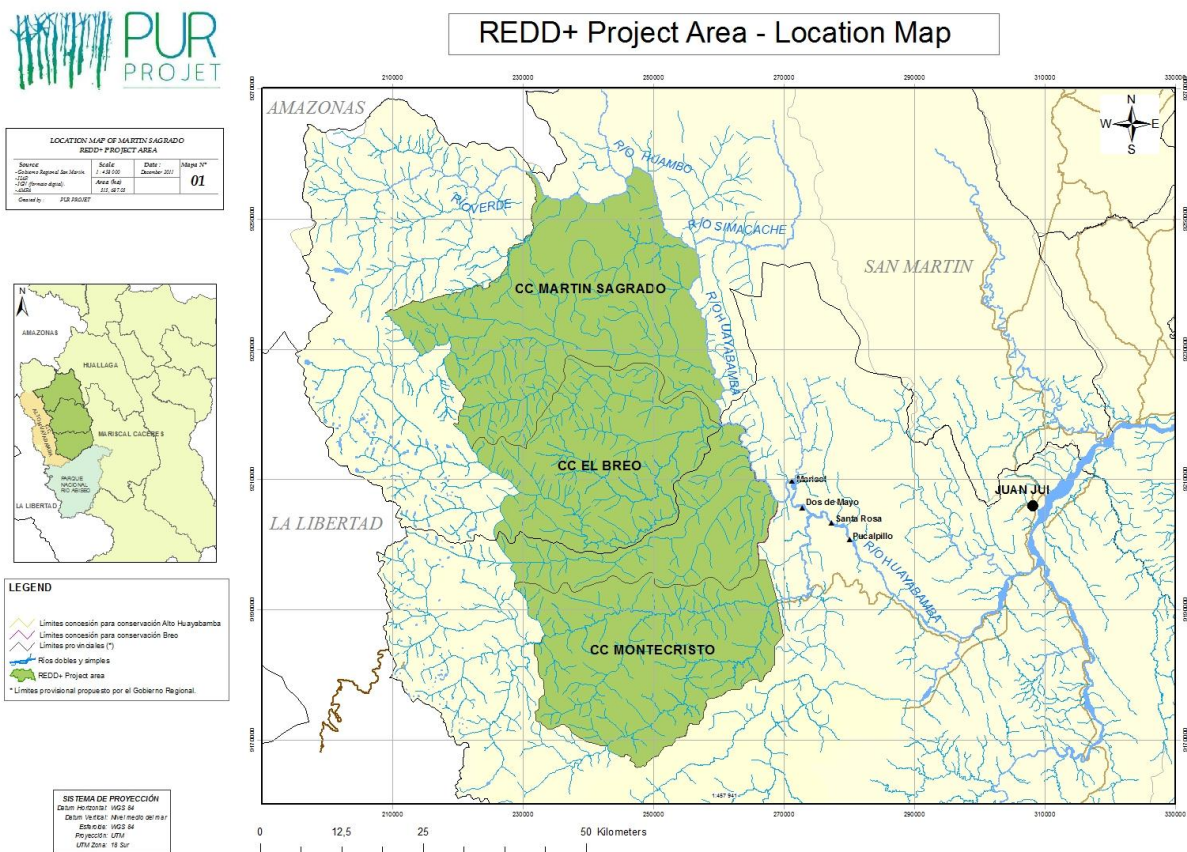
Figure 2 : Location of the project zone



Project area:

The project area encompasses 313 687 hectares, and is constituted by three concessions with conservation purposes: Martin Sagrado, El Breo, and Monte Cristo. It is constituted by primary forest at more than 97%; only 3 small communities live inside the project area.

Figure 3: Location of the project area



G1.1.2 Climate

The proposed REDD project activity takes place in the Tropical Rainforest area (GPG LULUCF 2006, IPCC). According to the Koppen Classification System, the climate of the region is of the type AM, that is to say tropical warm, season humid, characterized by presenting abundant rainfall and a short dry season, which has no significant influence on the development of the vegetation due to the abundance of rainfall during the rest of the year.

According to the climatic classification proposed by Dr. W. Thornthwhite it has been determined that the climate in the area is humid and warm.

In general terms, it can be concluded that the climate in the studied area allows the development of agricultural activities and cattle raising without major limitations. On the other hand, the forestry sector is limited during the rainy season with respect to wood supply, which leaves a maximum of 5 months appropriate for the efficient use of this resource.

According to the Economic Ecological Zoning San Martín Region, the proposed area has the following types of weather:

Climate AB'4 Type: Corresponds to a super-humid climate (A) and semi-warm (B'4). It is located above 1200 to approximately 2000 m, especially on mountain slopes. It is estimated that every month excess moisture is present. It covers an area of approximately 15.67% of the proposed area.

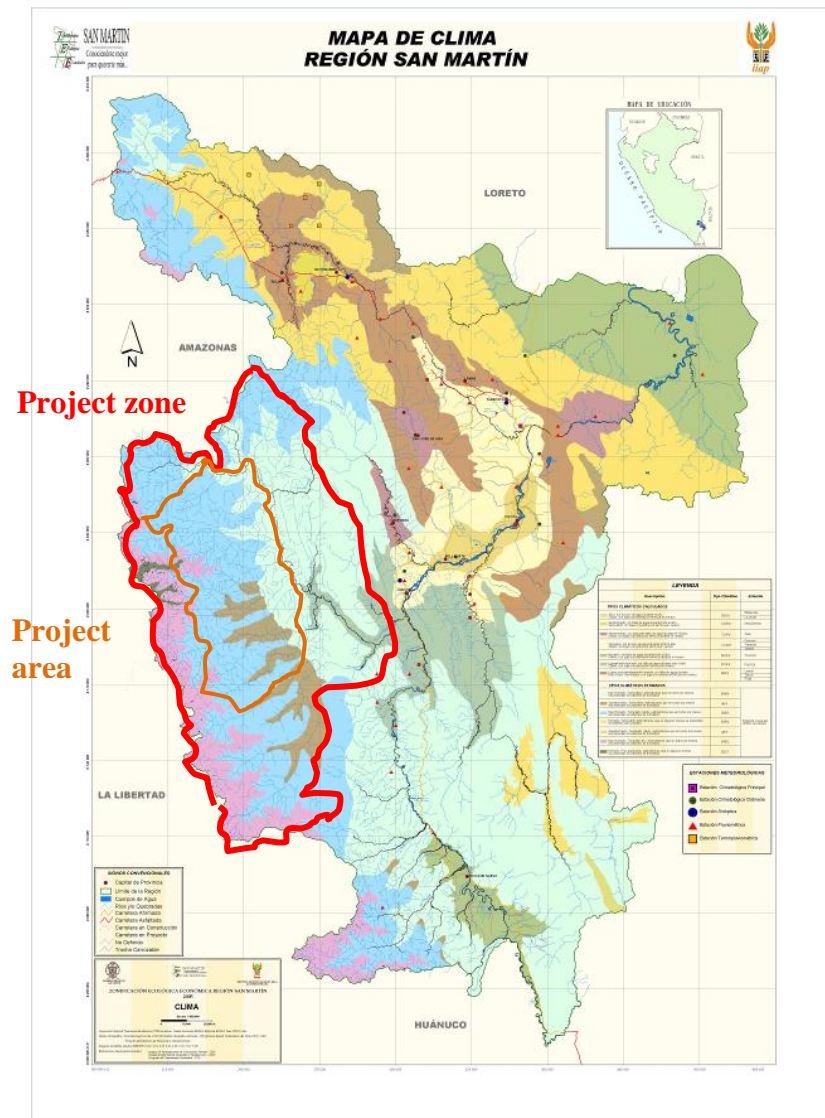
Climate B1rA'a' type: corresponds to a slightly damp climate (B1) and Warm (A'), with no water deficit (r) and low heat concentration in the summer (a '). It is estimated that every month excess moisture is present. It covers an approximate area of 0.01% of the proposed area.

Climate B4B'2 Type: Corresponds to a very humid climate (B4) and cool temperate (B'2), which corresponds to the jungle, which is located above 3000 m, especially on the hillsides. It is estimated that every month excess moisture is present. It covers an approximate area representing 2.64% of the proposed area.

Climate B4B'3 Type: Corresponds to a very humid climate (B4) and warm temperate (B `3). It is located at altitude levels ranging between 1800 and 2800 meters. It is estimated that every month excess moisture is present. It covers an area representing approximately 50.74% of the proposed area.

Climate B4B'4 Type: Corresponds to a very humid climate (B4) and semi-warm (B'4). It is located below 1200 m, especially on the slopes of mountains. It covers an area representing approximately 30.94% of the proposed area.

Figure 4: Climate map of the project zone



G1.1.3 Geology

The geological units that form part of the Concession are as follows (see Map No. 05: Geological Survey)

Intrusive San Martín (Ps-gr/gd): Its composition is represented mainly by granite and granodiorite whitish color (leucocratic). This unit is considered an intrusive complex, as it shelters different types of igneous rocks ranging from granites, granodiorites and subvolcanic bodies as quartz latite. It occupies an approximate area equivalent to 0.11% of the proposed area.

Yarahuango Formation (Py): Corresponds to a set of red lithology continental layers, which begins the continental sedimentation with minor interruptions of marine transgressions. It occupies an area approximately equivalent to 0.19% of the proposed area.

Chonta Formation (Km-ch): Formed by limestone sequences as micritic limestones, bituminous marl, shale levels, pelitic as silty clays, gray-green. Silty clay presents gray-green laminar sequences, housing among drywall layers that are exposed in cross and parallel manner, and rectangular lenses of sandstone. Occupies approximately an area equivalent to 0.38% of the proposed area.

East Group (Ki-o): Includes white sandstone outcrops of medium-grained quartz. East Group sediments have undergone depositional stages, ranging from those made in an epicontinental shallow sea, which ranged between stages of transgression and regression; to sediments deposited in a tidal environment (deep sea). It occupies an area approximately equivalent to 3.91% of the proposed area.

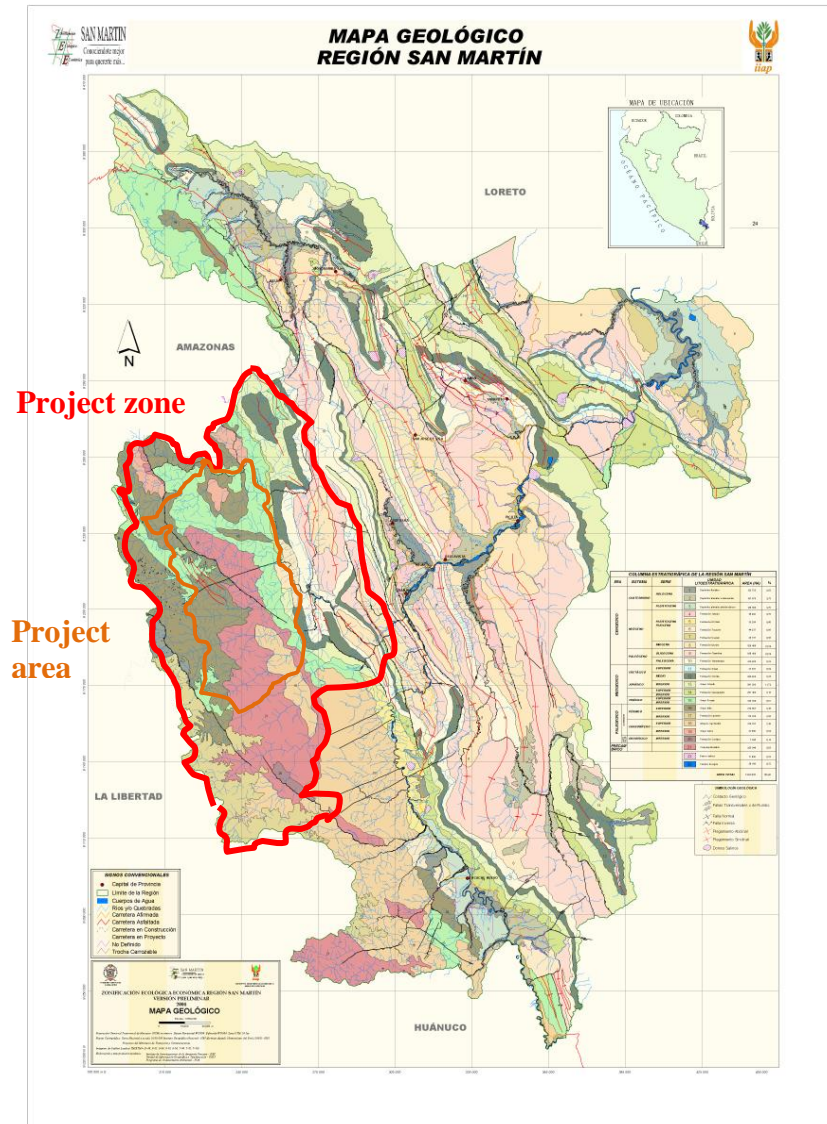
Ipuruo Formation (Nm-i): Formed by reddish calcareous claystones grading to siltstone, sandstone interspersed with thin gray to greenish calcareous beds. Includes gray marl, reddish sandstone fine to medium grained, calcareous red claystones and volcanic sediments. It covers an area approximately equivalent to 7.09% of the proposed area.

Pucara Group (TsJi-p): Training Chambar, carbonate sequence consists of dark gray limestone interbedded with bituminous limestone and dolomitic limestone. As seen in the area where it floats Huicungo Huayabamba-gray limestone sequences, which occurs in thin to medium layers. It encompasses an area approximately equivalent to 26.18% of proposed area.

Mitu Group (Ps-m): Composed of a purely detrital molasse sequence alternating with volcanic material. These molasses are composed of conglomerates and sandstones interbedded with coarse-grained thin red shale levels. The clusters have the nature of shale, quartzite and granite, forming a sequence whose key feature is red. This group covers an area approximately equivalent to 29.01% of the proposed area.

Marañon Complex (PE-m): The representative lithology consists of greenish shales, gray gneiss, quartzite, slate, and metavolcanic. It occupies an area approximately equivalent to 33.13% of the proposed area.

Figure 5: Geology map of the project zone



G1.1.4 Hydrology

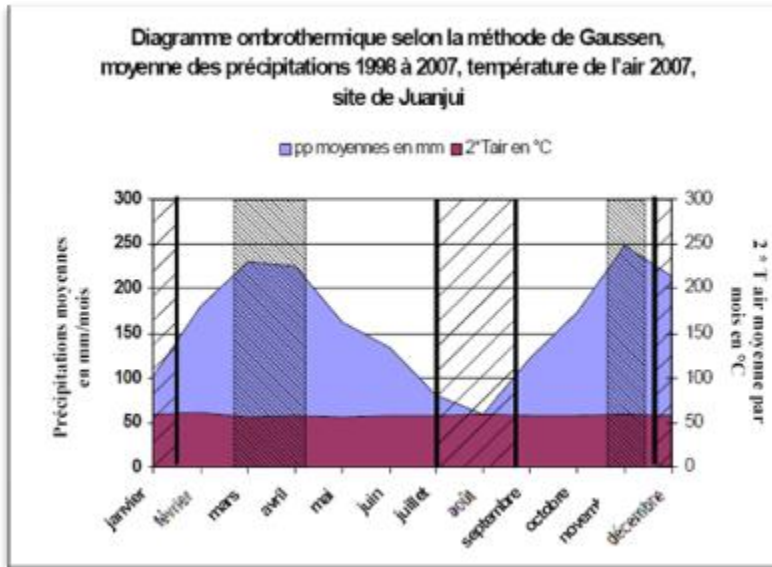
From the mountain are going down numerous highly torrential streams, carrying products of erosion (sediments), flowing into the tributaries of the Huallaga River.

In general terms, the area is characterized by the presence of abundant rainfall during most part of the year, being able to differentiate a long season denominated "winter" from October to May and a short dry season denominated "summer" from June to August. This pattern does have a significant influence on the development of the vegetation in the area.

Based on the information obtained from the Assis and Brasileira meteorological stations in Brazil between 1980 and 1989, the total medium annual rainfall is 2000 mm. This same data amounts to 1837 mm in Martin Sagrado. It can be appreciated that rainfall has less intensity during the months of May to September, where 20 to 25% of the total annual rainfall occurs. However, the dry season is not so dry, and there's no severe drought in the region.

During the most rainy period, from October to April, 75 to 80% of the total annual rainfall occurs. Medium rainfall in the area shall be evaluated to approximately 1800 mm annually.

Figure 6: Hydrology diagram in Juanjui (1998-2007)



Source: (RAJAUD, 2008)¹

G1.1.5 Hydrography

Taking as a reference to Maco, J. (2005), rivers and streams that make up the hydrographic network of the project zone are of the "clear water", which is characterized by the presence of crystalline water, allowing full transparency and clear observation of the channel bottom. This feature is that these water bodies are born and walk among the hills that present fairly consolidated geologic material. Many of them have moderate electrolyte content is reflected in the moderate electrical conductivity values. It is characteristic observed in these bodies of water turbidity after the fall of rain in the area of its basin, a process that lasts a very short time, and the presence of rapids in the rivers certain sections due to steep slopes of the channel into sections very short. These sections are usually partially blocked by rocks or stones that obstruct water, gaining power faster.

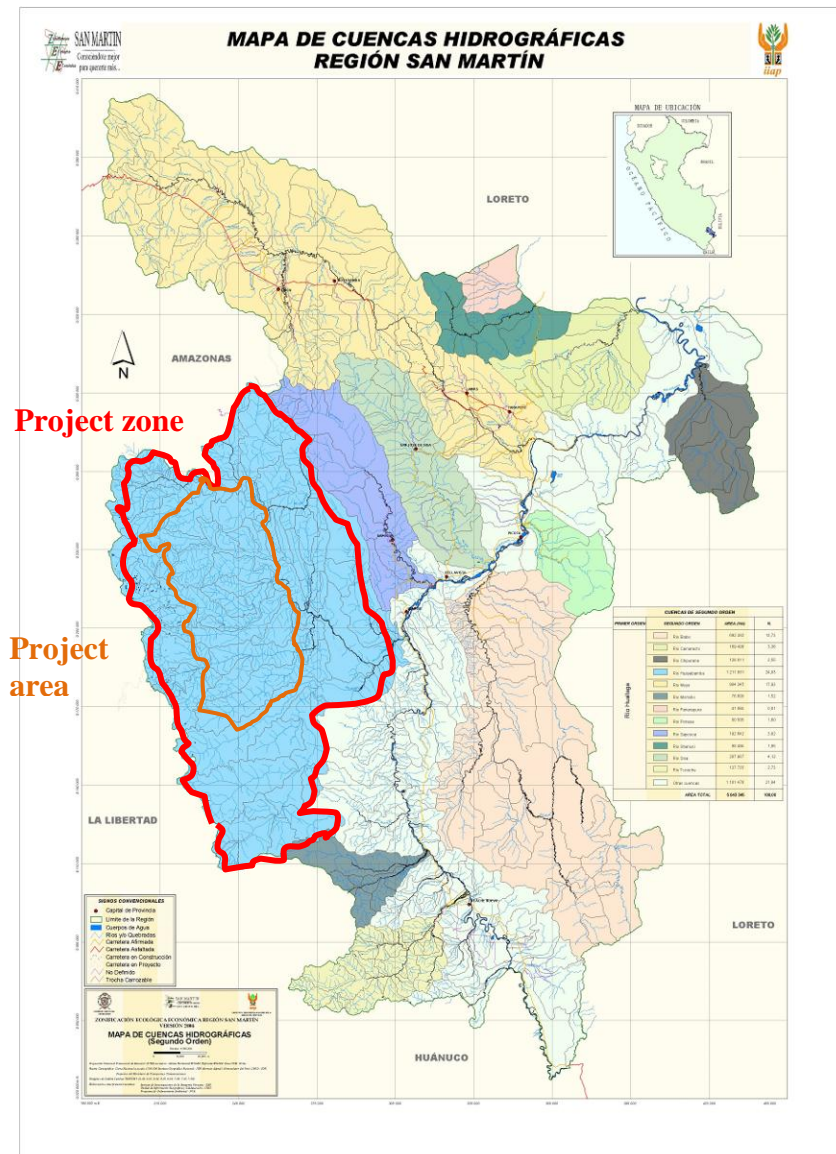


¹ RAJAUD A, 2008. Analyse-diagnostic d'une petite région agricole située dans l'aire d'influence de la coopérative cacaoyère Acopagro, région de San Martín, Pérou - *Mémoire de DAA Développement Agricole AgroParisTech.*

In the concession EL Breo, there are two watersheds: the watershed of Condorcillo 70,237.63 ha (61.71%). And the watershed of Rio Breo, comprising 43,588.50 hectares that represents 38.29% of the area. These rivers are major tributaries Huayabamba, born in the foothills of the Cordillera Oriental (see Map No. 08 Basin).

Below the confluence of Jelache to the confluence of Abiseo, there are no major tributaries of the river Huayabamba, but only a series of short gorges (4-6km) on its right bank. In its lower reaches, the Huayabamba receives input from the Abiseo.

Figure 7: Hydrography map of the project zone



G1.1.6 Physiography

Physiographic units that make up the surface area for project zone are described below:

Physiographic Province: Andean Cordillera

The Andes is generally characterized by presenting a varied topographical configuration from alluvial valleys and terraces to form hills and mountains, with very uneven relief. The project area has two units physiographic province weather: cold Land and Land perhumid warm to temperate.

G1.1.6 A) Unit warm to temperate climate Land:

Covers much of the project area. It covers an area approximately equivalent to 97% of the proposed area. With temperatures ranging from 14.5 ° C - 25 ° C, with annual rainfall of 500 to 4,000 mm and altitude from 500 to 3,500 meters. In the proposed area, this unit has two major climatic landscapes: mountainous (eastern range), mountainous terrain and hills (mountains subandina).

- Great mountainous landscape (Cordillera Oriental):

It is characterized by rugged topography with slopes ranging from 25 to 75%. It features a single landscape: High Mountain Landscape. It is formed by the elevations of land which have an altitude above 800 m. These categories are:

- High mountains of steep slopes: Dissected relief Presents Protection Association of Communal Forest Dos de Mayo - Alto Huayabamba Technical Proposal that supports the creation of the Conservation concession for "The Breo '30 with slopes ranging from 25-50%, soils are very shallow due to contact lithology.
- High mountains of steep slopes: Presents strongly dissected relief with slopes ranging from 50 to 75%. The soils are very shallow.
- High mountains extremely steep hillside: Presents strongly dissected relief with slopes greater than 75%. The soils are very shallow lictico by contact.

- Great Landscape mountainous terrain and hills (Sub-Andean Cordillera)

Exhibits from flat topography with slopes (0-4%) located in the valleys to very rough relief with slopes greater than 75%. It consists of a landscape that is described below: High Mountain Landscape. It consists of ground elevations have an altitude of over 800m. They have identified two sub landscapes according to its slope:

- High mountains steep slopes: Presents relief with slopes ranging from 25 to 50%. The soils are shallow.
- High mountains of steep slopes: Presents strongly dissected relief with slopes ranging from 50 to 75%. The soils are shallow to very shallow

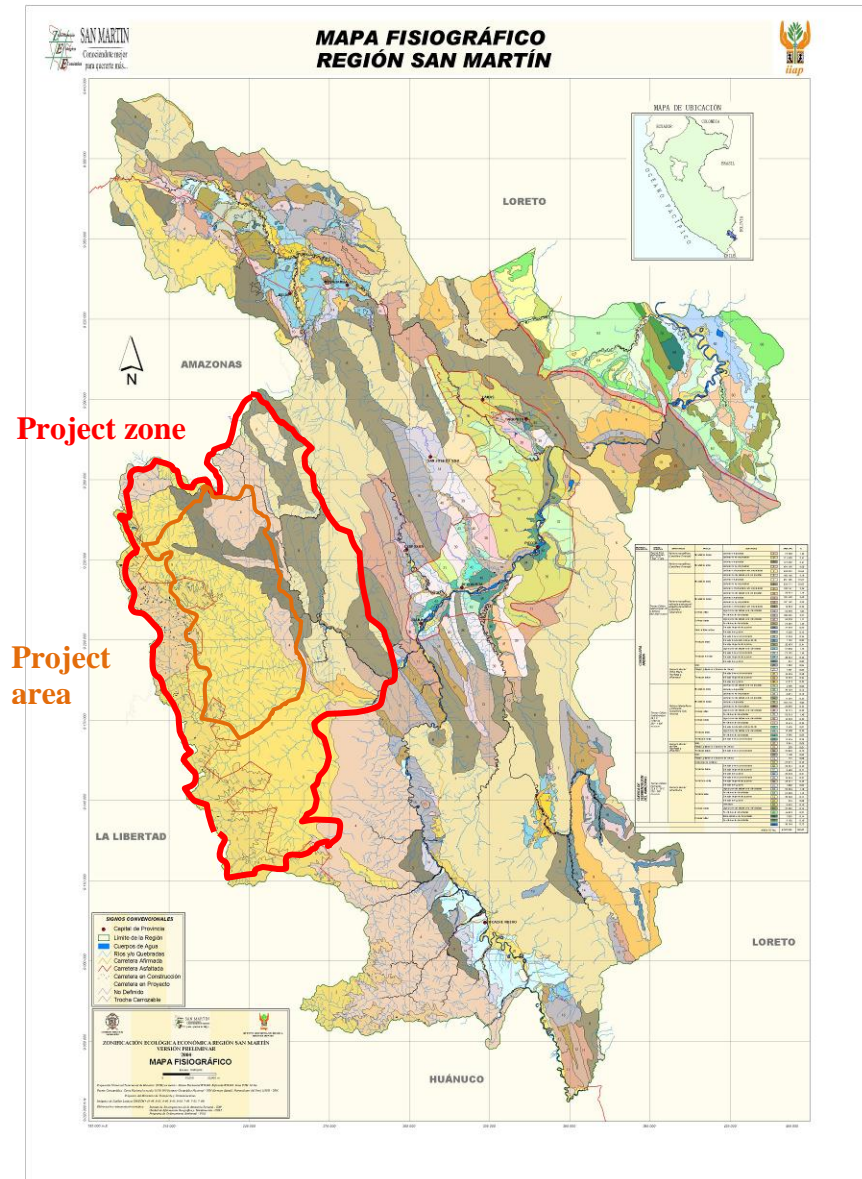
G1.1.6 B) Unit Climate: Cold Lands perhumid

It covers an approximate area of 3% of the project area. With temperatures ranging from 3 ° to 6 ° C, with average annual rainfall of 1,750 to 1,800 mm and 3.250 to 4.500 m altitude. This unit features a large landscape climate, mountainous relief (Cordillera Oriental), described below: Great Landscape: Mountainous Terrain (Cordillera Oriental), is characterized by rugged topography with slopes ranging from

25 to 75%. It features a single landscape: High Mountain Landscape. It is formed by the elevations of land which have an altitude of over eight hundred feet high. These categories are:

- High mountains steep slopes: Raised dissected with slopes ranging from 25 to 50%, soils are shallow to moderately deep, moist depressions in areas dominated soil organic in nature.
- High mountains of steep slopes: located in the western part of the San Martin region, have strongly dissected relief with slopes ranging from 50 to 75%, the soils are shallow to very shallow.

Figure 8: Physiography map of the project zone



G1.1.7 Soils

Generally soils are poor in nutrients, due to the nature of the lithology below, the strong chemical meteorization (caused by high temperatures and high humidity) and the washing of nutrients due to heavy rain during great part of the year. In these natural conditions, the fertility of the soil is linked to the organic cycle. Due to the abundant vegetative cover of the tropical forest there is a constant supply of organic matter, mainly as litter that afterwards is transformed into humus. Due to climatic conditions and the action of microorganisms, the decomposition of the organic matter is so fast that it only leaves a thin layer of humus relatively rich in nutrients. It is observed that most of the roots of the plants are found in this superficial layer to absorb the nutrients.

In the high plains, soils are generally well drained. Only in these not very dissected units, soils are poor and moderately drained. Soils in the high plains have low fertility and could develop toxic levels of aluminum for the plants.

Soils in low plains vary from poor to moderately well drained, depending on the grade of dissection. They have low to very low fertility and the aluminum saturation is very high.

In the highly dissected hills and in lower proportion, soils present a franca texture in the superficial layer and an accumulation of clay in the subsoil, consequently they are very susceptible to erosion.

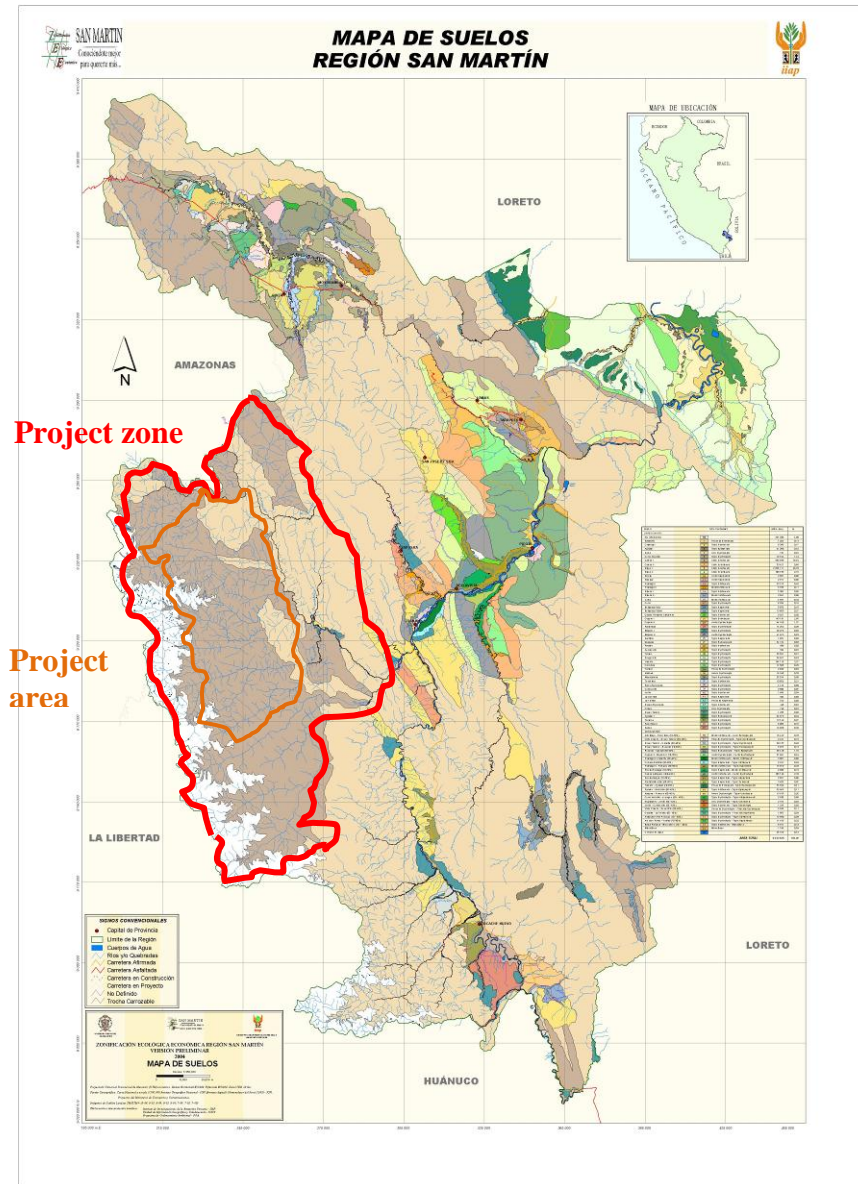
There are 5 soil series in the project zone, according to the “Zonificación Ecológica Económica 2004”, made by the regional government of San Martín, following the US Soil Taxonomy (1990):

Calera Series I (Lithic Udorthents): Equivalent to 78% of the proposed area. Made up of soils derived from calcareous residual materials (shales and limestones). The soil is very superficial, with a weakly developed A horizon, thin layered (less than 40 cm), well drained, variable texture, granular structure and friable consistency. These soils have a neutral reaction (pH 6.6-7.3), high organic matter content (8.48%). Due to some limitations of slope and depth, these soils are targeted for protection purposes only.

Nippon Series I (Lithic Udorthents): Equivalent to 20% of the proposed area. Made up of soils derived from acidic waste materials (quartz sandstones). Located in areas of steep slopes of high hills and mountains. They are very shallow, well drained, coarse-textured, friable mass. When there is still a C horizon of limited thickness and gravel mixed with smaller gravel of different degrees of decomposition. Extremely acidic reaction (pH 4.5), high aluminum saturation and base saturation. Due to some limitations of slope and depth, the vocation of these soils is geared for protection purposes only.

In very small proportions, on the banks of Huaybamba river close to Dos de Mayo, Santa Rosa communities, there are 3 more soil types: **Belavista Palido (Typic Hapludalts), Copara I (Typic Eutrudepts), and Moparo I (Typic Dystrudepts).**

Figure 9: Soil map of the project zone



G1.1.8 Soils Use capacity

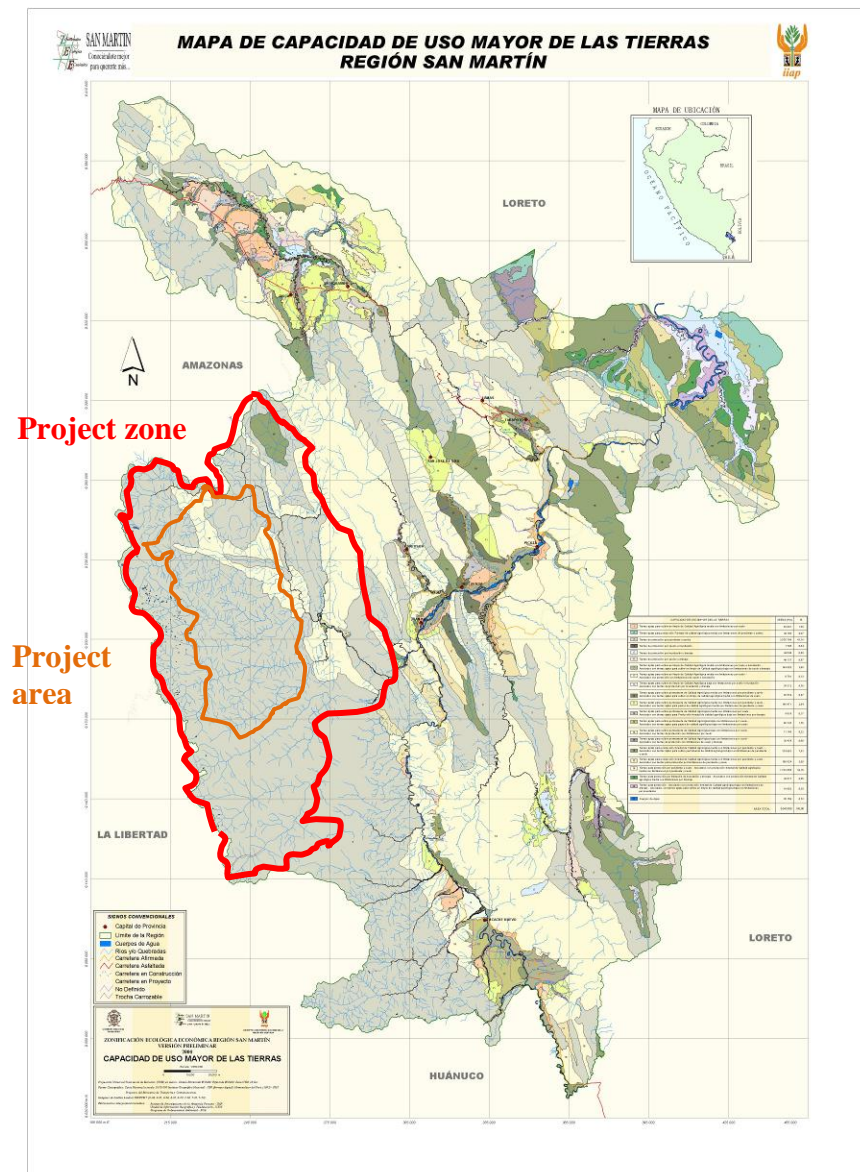
The project zone includes lands that have no ecological or soil conditions required for the operation of crops, pasture or forest production and other lands, although they have natural forest vegetation. Its use is not economical and should be managed for watershed protection, wildlife, scenic values, recreational and other involving collective benefit or social interest. Within this group we have:

Simple: Xes: Includes an approximate area of 85%, includes surface soils, in areas of steep slopes, with evidence of erosion. The limitations of use are related to soil and topographic factors, soil erosion.

Associated: Xes-F2es: Includes an approximate area of 15 %: association of soils for land protection with limitations concerning relief which is very steep, and land suitable for forest production, but with limitations concerning terrain, poor fertility and depth the ground.

At very small scale, on the banks of the Huayabamba river near the communities of Dos de Mayo and Santa Rosa, the project zone includes areas of land for permanent cultivation of average quality with limitations due to slopes and erosion, and land for forestry of average quality with limitations due to slopes and erosion.

Figure 10: Soil use capacity map of the project zone



G1.2. Types and condition of vegetation within the project area

G1.2.1 Ecosystems

The project area completes a major role in the connectivity between the Abiseo River National Park and the “Bosque de Protección Alto Mayo”, part of the Conservation Corridor for Abiseo - Condor - Kutukú, considered as high priority for conservation and nucleus of one of the centers of high diversity ("Biodiversity hotspots") in the Tropical Andes.

Part of the project area also has the status of being a buffer zone for the Abiseo River National Park.

Due to its hydrographic position and its topographic variations, the project area includes the following ecological floors: Tropical Wet Forest (bh T) and Subtropical Wet Forest (bh S/T) (in transition to a subtropical very wet forest).

Terrestrial Ecological Systems – SETs

The Data Center for Conservation - UNALM & TNC (2006), using biophysical models from different inputs and different methods, identifies and describes the terrestrial ecological systems (SET) of the Peruvian Yungas. Applying the digital map material produced by superimposing the reference and the proposed area coverage using the program Arc View 3.3, it was determined 09 types of SETs for the project zone, which are detailed below:

Pluviseasonal Andean shrub and high mountain grasslands:

They have a brush or grass-type cover, and xeric tropical or tropical pluviseasonal bioclimate. It is located in high mountain areas. Altitude 2900 m from the potential to over 3600msl.

High Mountain Rainforests:

Yunga hyper humid rain forest system, dominated and characterized by several species of evergreen trees and shrubs, and leaves lauroides sub-escleromorfas. Among species present in this well-preserved forests, the genera Podocarpus, Weinmannia, Oreopanax, Hesperomeles and Ilex. The forests are of low or medium height, canopy between 10 and 20 meters, featuring several levels or layers of undergrowth, large biomass of epiphytic non-vascular. It is located on high mountain slopes and ridges of mountains with frequent fog. Frequent Chusquea spp. and Ericaceae in the understory. Potential Altitude 3100 - 3200 msl to 3700 msl.

High Mountain Pluviseasonal forest:

Yunga forests in areas with humid pluviseasonal bioclimate. Existence of an period with marked decrease in annual rainfall. Crop conditions and human uses are also different from those in High Mountain rainforests, with a significant incidence of fire as an element or factor anthropic landscape transformation. It is located on high mountain slopes, soil deep, well drained. Potential Altitude 2900 - 3100 m to 4000 - 4200msl.

Medium Mountain Rainforests:

Set of associations of evergreen forests, of medium or high height, multi-layered and quite diverse. They have abundant epiphytes and common ferns. They thrive in areas with hyperhumid tropical bioclimate, on deep soils and well drained humus. Forests well preserved are generally dominated by species Podocarpus, Weinmannia Prumnopitys. It is located on mountain slopes with well drained soils and frequent fog. Potential Altitude 1700 - 1900 m to 2900 - 3100 meters.

Medium Mountain Pluviseasonal forest:

Ecological system similar as the Medium Mountain Rainforests, but in areas of pluviseasonal tropical bioclimate, particularly in mountain areas with less steep slopes or in valleys with partial effect of orographic rain shadow. Associations of seasonal evergreen forests, developed in humid pluviseasonal areas. And, as in the previous case, well preserved rain forests are dominated by Podocarpaceae species or genera as Weinmannia, Clethra, Hesperomeles and Ilex. It is located on mountain slopes with well drained soils. Potential Altitude 1700 - 1900m to 2900 - 3100msl.

Lower Mountain Evergreen forests:

Ecological system of the thermotropical Yungas whose potential vegetation is evergreen high and middle-height forest (15 - 20 meters). Vegetation is quite diverse, but often has in common several species of Juglans Cinchonoideas (Cinchona, Ladenbergia). They thrive in moist soil very deep, well drained to excessively drained slopes of the sub-Andean mountains. Potential Altitude 1200 - 2200msl.

Lower Mountain rainforests and palm forest:

Ecological system with dense multilevel forest vegetation, often with abundant palms Andes (Dictyocaryum), developed in the higher elevations of the lower mountains, above about 1200 to 1400 meters, where it is preferably higher slopes and ridges or mountain ridges of the sub-Andean terrain well exposed to rain and fog. It develops on soils quite deep. The floristic composition is often characteristic of species of trees and shrubs Cinchonoideas (Ladenbergia, Cinchona). It is located on high mountain slopes and ridges dividing well-drained soils. Potential Altitude 900 - 1000 m to 1700 - 2000 meters.

Mountain forests and xeric shrublands of interAndes valleys:

Vegetation of semi-dry and dry valleys of the interandes floor of the Yungas, which shows a marked climatic effect of orographic rain shadow with dry xeric bioclimate. It is located on the mountain slopes of the montane well-drained soils to more or less degraded or eroded. Altitude 2300-3200m.

Transitional Rainforest of the foothills:

Forest is structurally high (20-30 meters), multi-layered, evergreen and with high floristic diversity, constituting one of the most complex ecological systems, diverse and less known. It is strongly threatened by recent human colonization, involving high annual rates of deforestation. Mountain slopes and foothills with well drained soils. 800 to 900 meters above sea level from 1700 to 2000 meters.

G1.2.2 Vegetation

Based on the interpretation of LANDSAT TMS satellite images, the Technical Unit in charge of the Ecologic Economic Zoning of the San Martin Province carried out a classification of vegetation types. 53 vegetal formations have been identified of which 39 correspond to forests, totaling 2.8 million hectares in San Martin (Source: ZEE, 2005).

The presence of associations and subtypes of forests within the major identified vegetation types is caused by the heterogeneity that characterizes the tropical forests. Generally, the timber species are distributed within the whole area, varying in frequency and volume in each type of forest.

The proposed project zone encompasses 5 vegetation types :

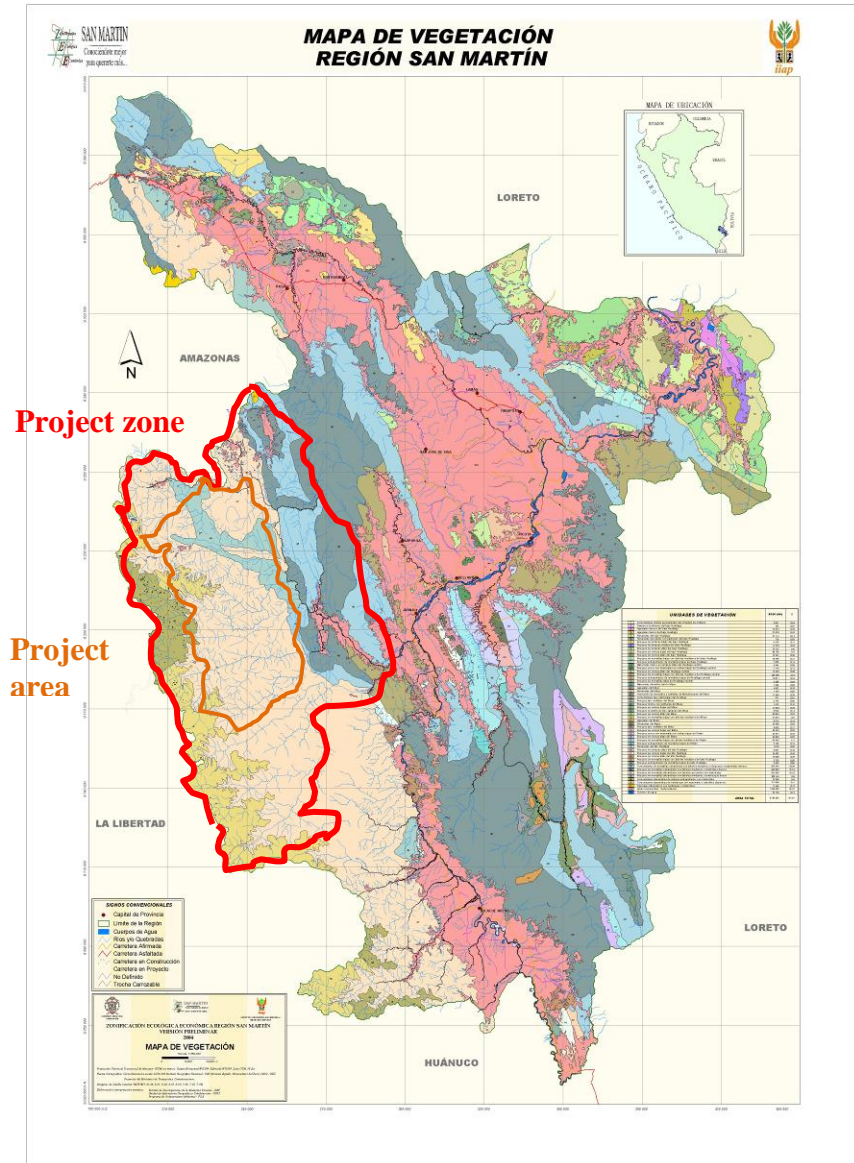
- Forests of higher Andean mountains with medium trees in asociacion with "matorrales" (approximately 85% of th area)
- Forests of lower Andean mountains with medium trees and dense "matorrales" (~5%)
- Forests of higher Andean mountains with medium trees and dense "sotobosque" (~4%)
- Combination in higher Andes of herbaceous with bushes and smaller trees and "matorrales" dispersed
- Combination in lower Andes of medium and dispersed trees with dense "matorrales"

This Amazon Andean foothill forest is characterised by the following species:

Aspidosperma rigidum, *Astorcaryum murumur*, *Attalea phalerata*, *Brosimum acutifolium*, *B. lactescens*, *Cariniana estrellensis*, *Cedrela odorata*, *Celtis schippi*, *Cetrolobium ochtryxylum*, *Clarisia biflora*,

C. racemosa, *Coussapoa ovalifolia*, *C. villosa*, *Erythrina poeppigiana*, *Guarea macrophylla*, *Iriartea detoidea*, *Leonia glyricarpa*, *Porcelia steinbachii*, *P. ponderosa*, *Poulsenia armata*, *Pourouma cecropiifolia*, *Protium opacum*, *Pseudolmedia laevis*, *P. macrophylla*, *Ruizodendron ovale*, *Sloanea guianensis*, *Socratea exorrhiza*, *Spaattosperma leucanthum*, *Swietenia macrophylla*, *Tabebuia serratifolia*, *Tapura acreana*, *Terminalia amazonica*, *T. oblonga*, *Trichilia pleeana*, *Thrihis caucana*. (Navarra, 2002²).

Figure 11: Vegetation map of the project zone



² Navarra, 2002, *Geografía Ecológica de Bolivia. Vegetación y Ambientes Acuáticos*. Centro de Ecología Simón I. Patiño-Departament de Difusión. Cochabamba. 719

Project area:

The project area encompasses 313 687 hectares, and is constituted by three concessions with conservation purposes: Martin Sagrado, El Breo, and Monte Cristo. It is constituted by primary forest at more than 99%; only 3 small communities live inside the project area.

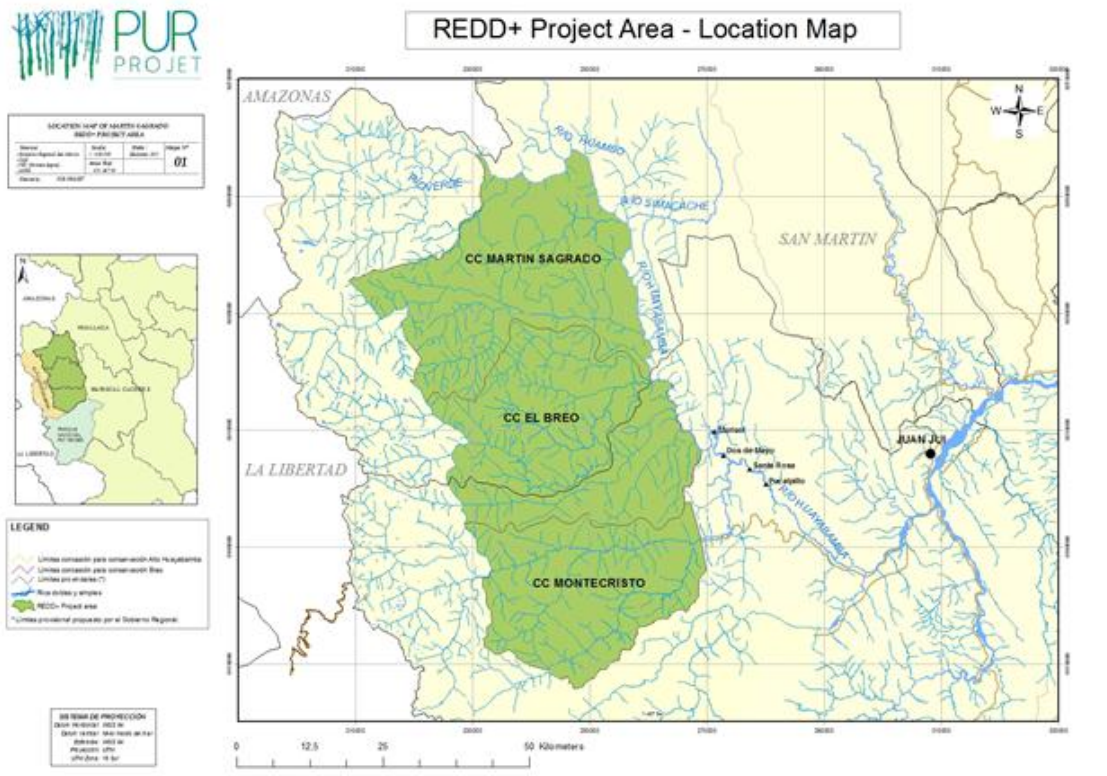
Boundaries are defined as follows:

Northern limit	Frontier with the Amazonas region, Rio Verde river
Southern limit	Frontier with National Park Rio Abiseo
Eastern limit	Huayabamba river
Western limit	Frontier with the concession Alto Huayabamba (Andes)

- The Association de Proteccion de bosques Comunales Dos de Mayo (EL BREO) owns the concession title of the concession El Breo.
- ACOPAGRO cooperative has solicited the concession Martin Sagrado, which is currently under attribution.
- The Asociacion de Productores Agropecuarios de Huicungo (APAHUI) is in the process of sollicitating the concession Monte Cristo.

The xml file of project area is available upon request.

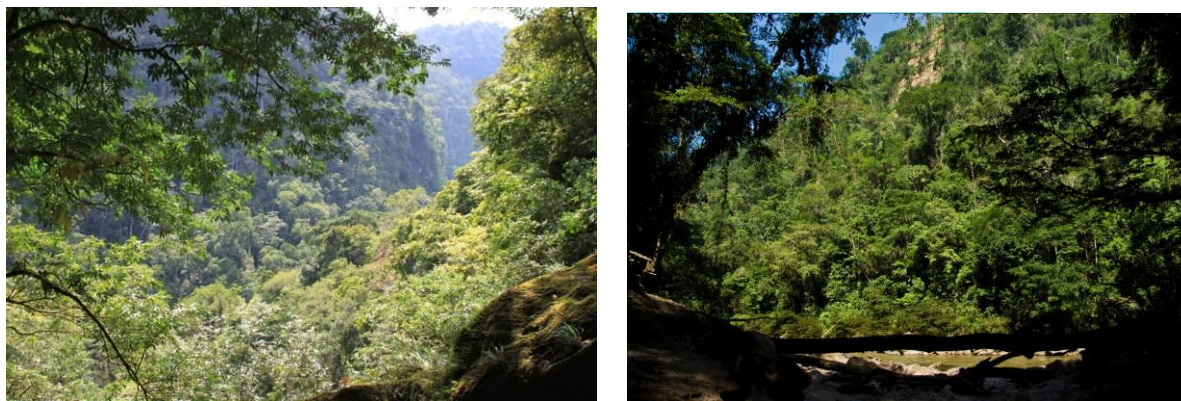
Figure 13 : Boundaries of the project area



G1.4. Current carbon stocks for each LULC class or forest stratum at project site

As mentioned in G1.2.2, the project area is constituted at more than 95% by Humid Forest of Higher Mountains, and vegetation is quite homogeneous in the whole area

Figure 14 : Pictures of forest type within the project area



According to the table 3A.1.2 of the IPCC Good Practice Guidance for AFOLU, average biomass density in tropical mountain forest in America is 234 tdm/ha, and the average root to shoot ratio is 0,24 (table 3.A.1.8).

Carbon stocks in living biomass above and below ground is therefore estimated at :
 $0,5 \times (1+0,24) \times 234 = 145 \text{ t C / ha}$, equivalent to **532 t CO₂/ha**.

Assuming conservatively nil carbon stocks for the 5% of the project area constituted by Pajonal Altoandino (shrubs, dispersed bushes, herbaceous),

The total carbon stock in living biomass of the project area is $313\,687 \text{ ha} \times 95\% \times 532 \text{ t CO}_2/\text{ha} =$
158 537 410 t CO₂

G1.5. Community information

In this chapter we develop the socioeconomic characteristics of the project zone (provinces of Mariscal Cáceres, Huallaga) through information collected by Amazonia Viva, by the INEI, the district municipality, the municipal delegate of Dos de Mayo, the Human Development Report of UNDP and obtained from surveys conducted in the field in a universe of 122 people (AMPA, 2008; Amazonia Viva, 2010-2011).

G1.5.1 Presentation of the participating communities

Communities within the project area

There are three communities living within the project area: La Morada, Canaan, and Anazco Pueblo. They mainly rely on livestock and coffee farming. As fuel they only use wood for cooking and mostly candles for light (70 to 95%) while solar energy is developing.

The three communities are typical examples of towns founded by a group of migrants, who originally came from the mountains to the jungle. The early years after establishment have been dedicated to the exploration of the environment, without interest for the protection of biodiversity. They slowly built up over 5 to 10 years some experience on the impact of mismanagement of resources.

They are located in the Eastern Andes, in the department of San Martin, on the slopes of the mountains oriented northeast above the river Huabayacu. However they depend politically on Chuquibamba in the department Amazonas. There are no roads to the villages, only paths from the district of Chuquibamba (2 to 3 days), and from the province of Bolivar (2 days). There is a proposal for the construction of a road by the Regional Government of Cajamarca, in order to facilitate the transport of forest products from Saposoa in the province of Huallaga, department of San Martin to Celendín department of Cajamarca.

- **La Morada**

Gathering 80 families, there are 150 students in the village, a kindergarten, a primary and secondary school. La Morada activity is based on livestock with a herd of about 500 animals. Community health is ensured by a medical post, a nursery and medicinal plants.

- **Canaan**

There is a kindergarten, a primary and a secondary school, 130 families and as many students in this village, 3 days walk away from the closest town. Their main income depends on livestock and coffee with 100 hectares of cocoa cultures and 400 animals. Both coffee and livestock products are sold outside of the village. Community health is also ensured by a medical post, a nursery and medicinal plants.

- **Anazco Pueblo**

Smallest community of the area, Anazco Pueblo gathers 15 families, representing 70 people in total, 22 students and 1 professor. There is only a primary school. Also relying on cocoa cultures and livestock, their herd is smaller with 100 animals and 20 hectares for farming. Community health is ensured only by medicinal plants.

Additional information on these 3 communities, collected during field trips to Chuquibamba, is available on request.

Communities within the project zone, in the provinces of Mariscal Cáceres and Huallaga

Major partners for REDD project:

- **Dos de Mayo** is the most populated village (898 inhabitants). They are considered as a “minor populated center” and have a delegated mayor. 59% of the inhabitants are men and 41% are women. 48% of the area (680 ha) are dedicated to cocoa production, with an average yearly production of 700kg/ha. The villagers also cultivate corn, plaintain, cotton and oranges and have around 100 cattle animals. 10.34% of the villagers are illiterate, 48.28% have a primary education, 34.48% have a secondary education and 6.9% have a higher education. There is a medical center in the village. A technical study is under process to evaluate the opportunity to implement a drinking water system. The Association de Proteccion de bosques Comunales Dos de Mayo owns the concession El Breo and is strongly involved in the REDD project since the beginning
- **Santa Rosa:** on the bank of the Huayabamba river, Santa Rosa is constituted by ~40 cocoa farmers, majority of the area is dedicated to cocoa production, with average yields of 1200 kg/ha. As part of the REDD project, they are developing a botanical garden to value floral biodiversity, and want to develop a guesthouse for visitors to come and visit the conservation area. Strongly involved in the project since the beginning, Santa Rosa is now soliciting a concession for conservation of 10 000 ha.

- **Pucalpillo:** located a little more downstream on the bank of Huayabamba river, 30% of the area (60 ha) are dedicated to cocoa production, with an average yearly production of 800kg/ha. The villagers also cultivate corn, plaintain, cotton and oranges and have around 40 cattle animals. 56% of the inhabitants have a primary education, 36% have a secondary education, 6% are illiterate and 2% have a higher education (no university). There is no medical center in the village. Strongly involved in the project since the beginning, the asociacion of productores agropecuarios de Pucalpillo (APAP) is now solicitating a concession for conservation of 20 000ha.
- **Huicungo :** located on the banks of the Huayabamba river, only 10km before the junction with Huallaga river, it is a major populated centers, with a municipality. Major incomes come from cocoa production, with some farmers members of ACOPAGRO cooperative, while others (~130 farmers) are joining the newly created Asociacion de Prodcutores Agropecuarios de Huicungo (APAHUI), whose aim is to develop as a complete cocoa cooperative. APAHUI is the organization sollicitating the concession for conservation Monte Cristo, part of the project area.

Other communities of the project zone :

- **Marisol** is the last populated community upstream on the banks of the Huayabamba River, on the historical and natural path to the inner areas of the project area. They mostly rely on cocoa production. There is primary education in the village and use hydroelectrical (mainly) and solar power for electricity generation.
- **Pizarro:** 35% of the area (80 ha) are dedicated to cocoa production, with an average yearly production of 400kg/ha. The villagers also cultivate corn, plaintain, cotton and oranges and have around 60 cattle animals. 2% of the villagers are illiterated, 68% have a primary education, 24% have a secondary education and 6% have a higher education (no university). There is a medical center in the village.
- **Mojarras:** 32% of the area (70 ha) are dedicated to cocoa production, with an average yearly production of 400kg/ha. The villagers also cultivate corn, plaintain, cotton and oranges and have around 30 cattle animals. 84% of the villagers have a primary education (complete) and 16% have a higher education. There is no medical center in the village.
- **Santa Ines:** 29% of the area (70 ha) are dedicated to cocoa production, with an average yearly production of 400kg/ha. The villagers also cultivate corn, plaintain, cotton and oranges and have around 100 cattle animals. 2% of the villagers are illiterated, 76% have a primary education, 20% have a secondary education and 2% have a higher education. There is a medical center in the village.
- **Gran pajaten:** 25% of the area (10 ha) are dedicated to cocoa production, with an average yearly production of 400kg/ha. The villagers also cultivate corn, plaintain, and cotton and have around 20 cattle animals. 10.35% of the villagers are illiterated, 48.27% have a primary education, 34.48% have a secondary education and 6.90% have a higher education. There is no medical center in the village.
- **San Juan de Pajaten:** 7% of the villagers have a higher education, 73.33% have a primary education, 13.34% have a secondary education and 6.33% of the villagers are illiterated. There is no medical center in the village.
- **Nueva Esperanza:** 25% of the area (25 ha) are dedicated to cocoa production, with an average yearly production of 400kg/ha. The villagers also cultivate corn, plaintain, cotton and organges and have around 30 cattle animals. 7% of the villagers are illiterated, 73% have a primary education, and 20% have a secondary education, 6.67% of the villagers are illiterated. There is a medical center in the village.

- **Primavera:** 31% of the area (45 ha) are dedicated to cocoa production, with an average yearly production of 700kg/ha. The villagers also cultivate corn, plaintain, cotton and organges and have around 30 cattle animals. 4.08% of the villagers have a higher education, 81.64% have a primary education, and 14.28% have a secondary education. There is no medical center in the village.
- **Luz del Oriente:** located at the northern tip of Martin SAgrado concession, at the boarder with Amazonas region, Luz del Oriente is a community depending on Rodriguez de Mendoza in Amazonas region. It is accessible by dust road from Mendoza up to 10km from the community.

Communities outside the project zone, though related to the project

- **Chuquibamba,** municipilaty located in Amazonas region, in the Andes, is the access point and political center for the 3 communities located within the Martin SAgrado project area (Canaan, La Morada, Anazco Pueblo). As such, it is implicated in the conservation project. It is accessible by dust road coming along the Maranon river bed.
- **Comunidad Campesina de Leymebamba,** located in Leymebamba, Amazonas region, in the Andes. Leymebamba is another access point to the 3 communities located within the Martin SAgrado project area (Canaan, La Morada, Anazco Pueblo). Also, the Community has sollicitated a concession for conservation in Amazonas region whose demarcation goes up to Martin SAgrado project area. As such, coordination with this community is interesting for the sake of both conservation projects.

ACOPAGRO cooperative

On top of local communities and community associations of local producers, the project is developed with a strong partner, owner of the Martin Sagrado concession within the project area: the ACOPAGRO cooperative

ACOPAGRO cooperative was created in 1997, as part of a United Nations program to substitute coca plantations with cocoa and other alternative crops in the San Martin region. It now counts 2000 members, small-scale producers of cocoa and sugar cane having 5 hectares of land each, with an average 2.2 ha of cocoa fields. Most of the farmers were coca planters in the past.

The organization is FLO and Organic certified (standards EU et NOP) and is very successful, both on its commercials activities (ACOPAGRO has become in ten years Peru's first cocoa exporter) as well as towards its compliance to fair trade principles. ACOPAGRO can be considered as a model organization and has been certified under Alter Eco Gold Standards in 2009 by SGS.

3 000 hectares of cocoa fields have already been planted and are harvested, the equivalent of 3 millions cocoa trees. Cocoa trees need 40 % shade to give their best potential, hence producers are willing to plant native trees in combination with their cocoa trees. As well, the small scale producers dispose of many areas of degraded land and pastures, because of the former coca plantations or food crop plantations, that they are willing to reforest with native trees for forestry activities.

To help the farmers to achieve these objectives, ACOPAGRO and PUR PROJET set up a reforestation program in 2008 called Alto Huayabamba. The plantation started in April 2008 and the project is now fully operational with 1 million trees planted (D cember 2011) and was validated according to the VCS standard. The objective is to plant 2 million trees over 2300 hectares (depending on plantation of models between agro-forestry and forestry only plantations), of degraded land and cultivated land, practicing agro-forestry combining native trees species with cocoa trees and forestry plantations. The project is funded via the sales of environmental services (trees certificates) and of ex-ante carbon credits (VCUS).

Carbon offset is very complimentary with Fair Trade and organic production, the Internal Control System is already in place for organic production, and producers very well trained on traceability. The climatic conditions are very favourable for vegetation growth, hence for carbon offset. ACOPAGRO has already proved its capacity to plant and secure a sustainable plantation. The need of the area is very large, both for coca producers, and much as for the damaged environment of the region.

G1.5.2 Population

This particular region has been quite recently populated, with a significant growth of the population dating back to the 1940's. The participants in the project are the second or third generation, the majority of them discovered cacao farming recently. Their parents and grand-parents came in the region thanks to colonization programs. Consequently, the traditional love of the land that is obvious when it has been transmitted from generation to generation does not really exist.

It explains why it has been easier for the producers to slash and burn the land as they did not have the culture of protecting the land and the species. This is changing with the co-operative thanks to the agricultural trainings. This is also changing with the reforestation program and the understanding that biodiversity is an essential process.

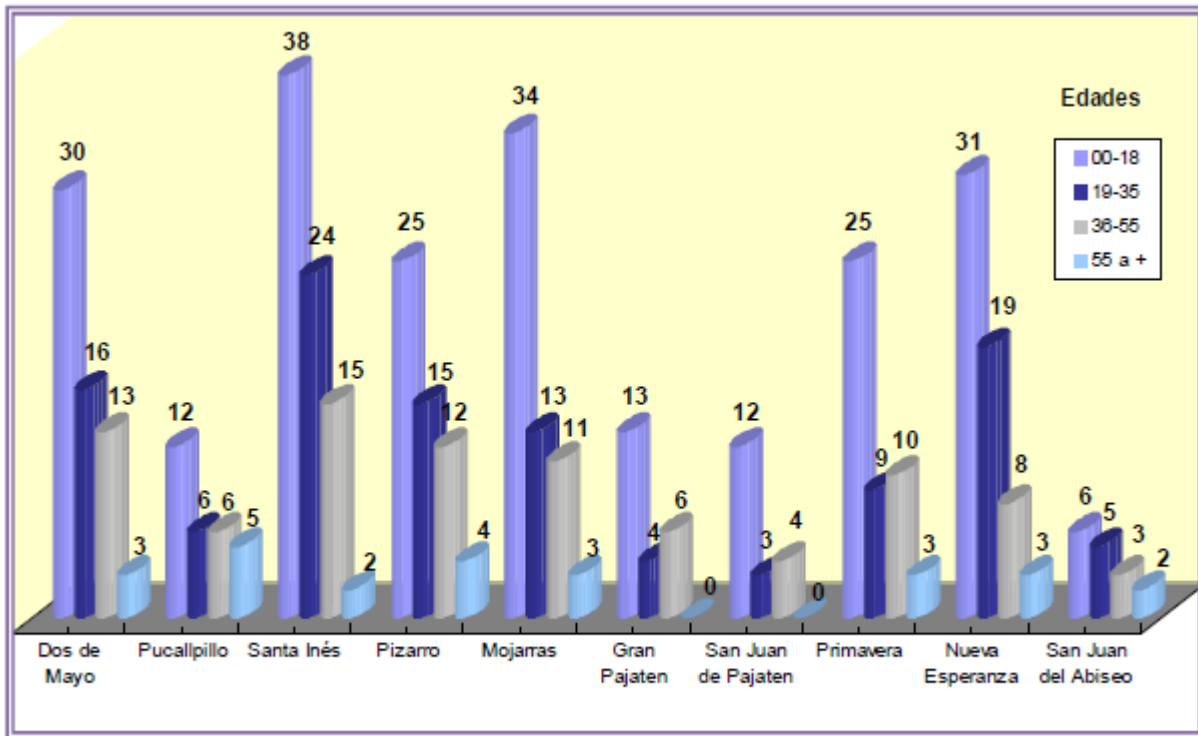
The producer's pride to be members of ACOPAGRO or other association of producers, the cohesion and solidarity, the strong will to integrate more producers in the development process, the awareness and understanding of the deforestation issue strengthen the organization and improve the results in terms of sustainable development.

Table 2 : Population distribution according to age group

Community	Age groups / Percentage								Sample (hab)
	00-18	%	19-35	%	36-55	%	55 a +	%	
Dos de Mayo	30	48.39	16	25.81	13	20.97	3	4.84	62
Pucallpillo	12	41.38	6	20.69	6	20.69	5	17.24	29
Santa Inés	38	48.10	24	30.38	15	18.99	2	2.53	79
Pizarro	25	44.64	15	26.79	12	21.43	4	7.14	56
Mojarras	34	55.74	13	21.31	11	18.03	3	4.92	61
Gran Pajatén	13	56.52	4	17.39	6	26.09	0	0.00	23
San Juan de Pajatén	12	41.38	3	10.34	4	13.79	0	0.00	19
Primavera	25	53.19	9	19.15	10	21.28	3	6.38	47
Nueva Esperanza	31	50.82	19	31.15	8	13.11	3	4.92	61
San Juan del Abiseo	6	37.50	5	31.25	3	18.75	2	12.50	16
Total	226		114		88		25		453

Fuente: AMPA. Socioeconomic study. 2008.

Figure 15 : Population distribution according to age group



Fuente: AMPA. Encuesta socioeconómica. 2008.

G1.5.3 Housing, sewage, energy, subsistence

The majority of the families part of the Martin Sagrado project have houses and residences are generally made of wood with roofs made of palm thatch.

None of the communities except Huicungo has a basic sanitation system, potable water service or trash collection. Organic trash is deposited naturally on the ground surrounding the residences or in the fields and is incorporated into the soil. The non-organic trash is separated and burned.

The population has access to potable water resources directly from water sources such as Huayabamba river, the river Jelache and the river Abiseo, as well as the various creeks and tributaries in the zone. As for sewage, this service is also inexistant so it is common to find latrines built by the villagers themselves. On the other hand, the Dos de Mayo Town Center has a technical file which was developed by USAID / PDA, to install a water system. Currently, this record is being complemented sewer service for submission to the District Municipality of Huicungo.



Energy: Except for Huicungo, most of the communities along the Huayabamba river are not connected to the grid. The community of Dos de Mayo has established an alternative service using a generator that runs on gasoline. The municipality of this community provides this service to its population over 4 hours from 6pm. S/.25.00 is the monthly fee per family served. The community of Marisol relies on

hydroelectrical power. Some families in other communities are slowly testing small solar panels to charge batteries. Most of the need for lighting is covered with candles and kerosene lamps. On the other hand, almost all of the population uses firewood for cooking, as well as the kitchens are rustic stone or clay.

All of the communities depend on subsistence agriculture (platanos and fruit production) and extractive activities, such as fruit collection, fishing and hunting to supplement their diets. Usually, subsistence practices are used when fishing and hunting, with fish providing the major source of protein in the communities.

G1.5.4 Education and health

It's the least supplied area, most of these people only have health promoters, with an incipient implementation. Only in Huicungo and in the communities of Dos de Mayo, Nueva Esperanza and Santa Inés are medical centers where residents come from other communities. However, the lack of resources and medical supplies to people forced to move to the city of Juanjui in emergencies and in the case of La Morada y Los Chilchos toward Bolívar or Leymebamba.

In Alto Huayabamaba, going to school may be hard (20 minutes walk from Santa Rosa, but some producers are further away along the river) because of the isolation of the area and the access only by boat. The good point about schooling is that many of the producers interviewed succeeded to send their children to university thanks to the cocoa revenues. This shows a great progress in the standard of living of producers and their family. Students of different levels compose the school classes, what makes the teacher's work more difficult, since she must teach all the students at the same time in the same classroom.

There is no organized system of health care provided by formally trained medics. Basic emergency assistance (first aid) is provided by community members and is based on traditional knowledge or training provided by the local municipality. The most common health problems and illnesses are malaria, diarrhea, verminosis, malnutrition, flu and hypertension. The treatment of more serious problems requires transportation to the hospital in the city of Novo Aripuanã in "rabetas" (wooden canoes with small outboard motors).

TABLE 3: Educative infrastructures in participating communities

comunidad	Infraestructura Educativa		Nº	Niveles		
	Si	No		I	P	S
Dos de Mayo	X		00420	X	X	X
Santa Inés	X		00639	X	X	
Pucallpillo	X		00462		X	
Mojarras	X		0002		X	
Nueva Esperanza	X		0004		X	
Gran Pajaten	X					
Pizarro	X		00421	X	X	X
Primavera	X		00005	X	X	
San Juan de Pajaten	X	X				
San Juan de Abiseo	X	X				
La Morada	X				X	X

Fuente: AMPA. Encuesta socioeconómica. 2008.

Table 4 : Population distribution according to educational level

Community	Instruction level			
	Primary	Secondary	Superior No University	Analphabet
Dos de Mayo	48.28%	34.48%	6.90%	10.34%
Santa Inés	76.00%	20.00%	2.00%	2.00%
Pucallpillo	56.00%	36.00%	2.00%	6.00%
Mojarras	84.00%	0.00%	16.00%	0.00%
Nueva Esperanza	73.33%	20.00%	0.00%	6.67%
Gran Pajatén	48.27%	34.48%	6.90%	10.35%
Pizarro	68.00%	24.00%	6.00%	2.00%
Primavera	81.64%	14.28%	4.08%	0.00%
San Juan de Pajatén	73.33%	13.34%	7.00%	6.33%
San Juan de Abiseo	66.50%	22.50%	5.00%	6.00%

Source: AMPA. Socioeconomic study. 2008.

G1.5.5 Gender issues

Majority of members are male but there are women as well. Women interviewed declared to be well accepted and felt like any other member. It is interesting to note that during all the meetings with producers, men requested women to participate, what they refuse to do most of the time, nevertheless requesting their participation is a start in the emancipation process.

There are also many women employees at the coop level as well, with very good spirit apparently at the offices and at the producer level and good integration of women, in Peru which is traditionally quite male dominant

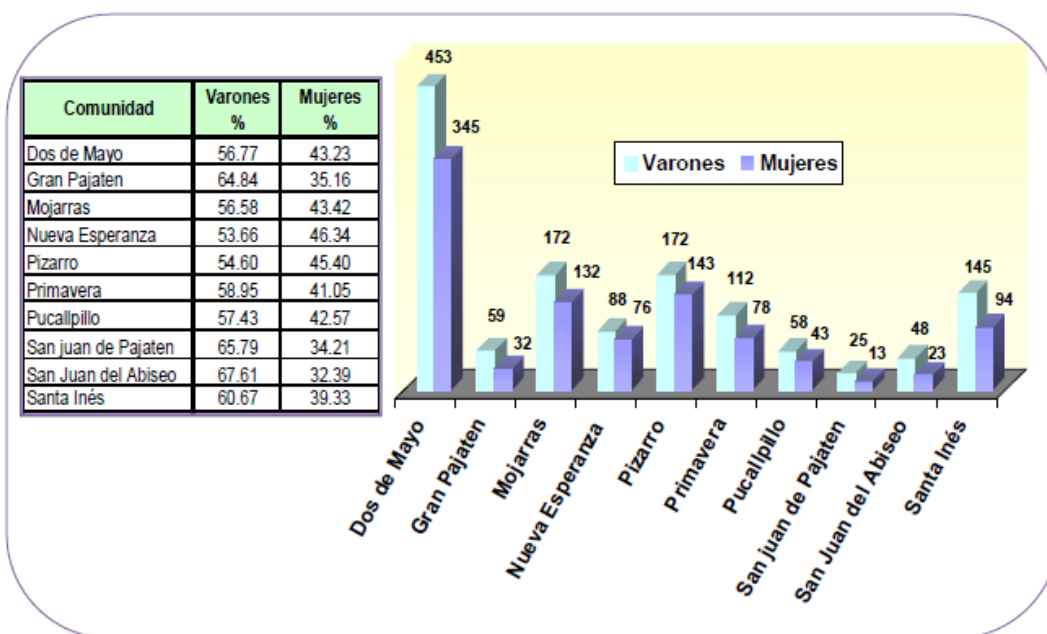
TABLE 5: Homes, houses and population by gender

Comunidad/Anexo	Hogares	Viviendas	Varones	Mujeres	Total
Dos de Mayo	211	211	453	345	798
Arica	3	3	4	4	8
Atun rumi	10	10	20	14	34
Chilin	1	1	1	1	2
Chorro	3	3	3	4	7
Gran Pajatén	27	27	59	32	91
La Quinta	3	3	3	4	7
Llano	6	6	15	11	26
Mojarras	74	86	172	132	304
Monte Bravo	1	1	1	1	2
Nueva Esperanza	43	43	88	76	164
Oro Mina	1	1	2	1	3

Pizarro	91	92	172	143	315
Primavera	50	50	112	78	190
Pucallpillo	28	28	58	43	101
San Juan de Pajaten	13	13	25	13	38
San Juan del Abiseo	31	31	48	23	71
Santa Inés	64	64	145	94	239
La Morada - Chilchos	89	89	167	155	322
Total	749	762	1548	1174	2722

Source: District Municipality of Huicungo. 2008. & AMPA. 2008.

Figure 16 : Distribution of population by gender



Elaboración AMPA. Fuente: Encuesta socioeconómica. 2008.

G1.5.6 Economy and Income

The participants are poor but their living conditions are acceptable, except regarding nutrition, education and health. People have access to drinkable water and food from their fields. They own 2 to 5 hectares of land, of which 0,5 to 3 are planted with cocoa trees. They earn an average 3000 to 5000 Euros a year of sales.

As shown in the UNODC (United Nations Organization against Drug and Crime), the revenues of the producers have increased steadily



and the ACOPAGRO Fair Trade project can be considered successful. All producers interviewed declared they were really happy with the project since they started. They used to be coca growers but now earn as much with cocoa

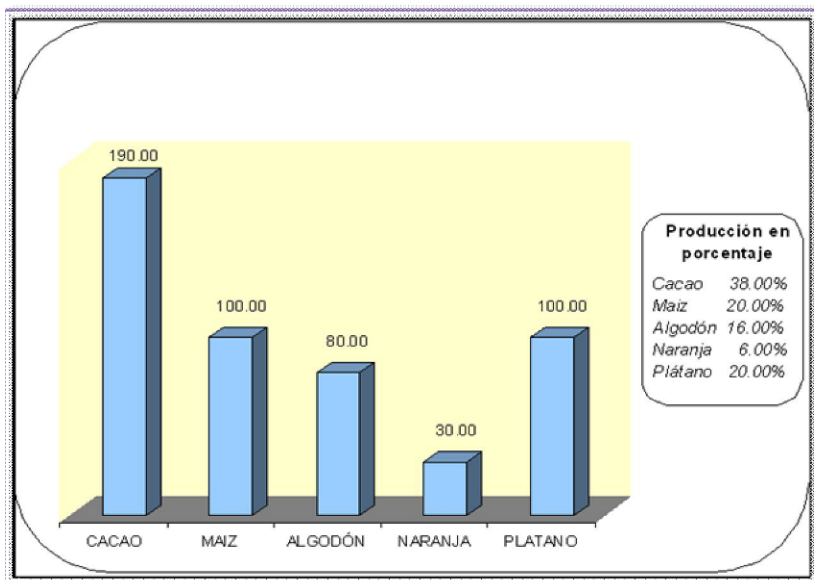
There is more land available to buy and convert from monoculture (coca, sugar cane,..) to consortium fields (cocoa + native forest). This gives producers the opportunity to develop their sales, the objective is to bring them from an average 1,5 hectares of cultivated cocoa trees to a minimum of 5 hectares, for them to reach a decent revenue and be in capacity to develop even more their farm. The area is quite isolated, especially for Alto Huayabamba accessible only by boat, but on the other hand, there is land there to buy and to plant.

The most important economic activities are the cultivation and sale of cocoa and sugar cane. Most of the families raise chickens for domestic consumption and others raise cows on a small scale.

According to the data provided by the Agricultural Cooperative Cocoa - ACOPAGRO, agricultural production is estimated by community, is as follows:

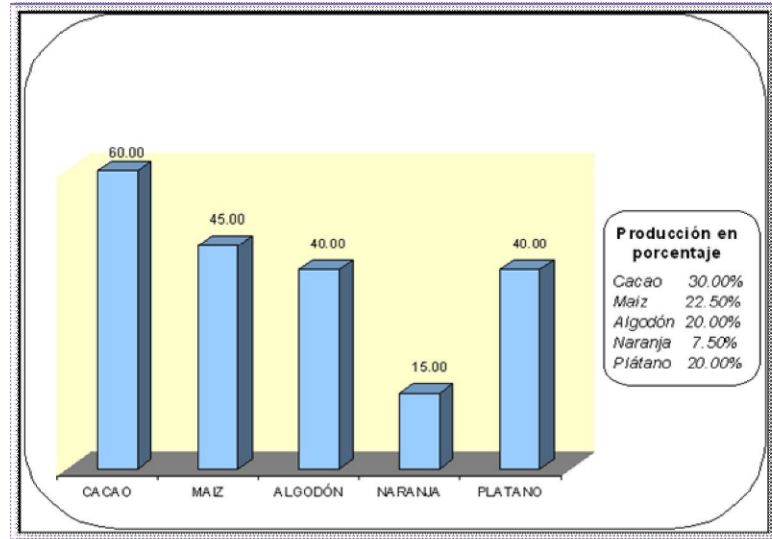
Dos de Mayo: 38% (190ha) is cocoa, with an average production of 400kg/ha year and the sale price is S / . 6.4 kg. 20% (100ha) corresponds to a maize and banana cultures, respectively. The average maize production is 2000 kg / ha and the sale price is S/.0.70kg. The average production of banana is 10 MT / ha and the price is S/.0.50 kg. The 16% is cotton, is 80 ha, with an average production of 1200 kg / ha.year and the sale price is S/.1.20kg. The 6% corresponds to the orange crop, ie 30 ha with average yield of 40TM/ha. The sale price is S/.0.20kg. In the Commonwealth of Dos de Mayo, there are approximately 100 head of cattle, being the selling price per head S/.700.00.

Figure 17 : Estimated agricultural production - Dos de Mayo Community



Pucallpillo: 30% (60 ha) is cocoa, with an average production of 400 kg / ha year and selling price per kilogram of S / . 6.4. 22.5% (45 ha) is corn. The average production is 2000 kg / ha and the sale price is S/.0.70kg. 20% (40 ha) is made of cotton and banana crops. The average production is 1200 kg / ha and the price is S/.1.20kg. The average production of banana is 10 MT / ha and the sale price is S/.0.50 kg. 7.5% (15 h) corresponds to the orange crop, with production and 40TM/ha average selling price per kilogram of S/.0.20. Also, there are approximately 40 head of cattle. The selling price per head is S/.700.00

Figure 18 : Estimated agricultural production - Pucallpillo Community



Gran Pajaten: In this community, each culture is represented by 25% each, ie 10 ha are used for the production of cocoa, 10 ha for maize, 10 ha to 10 ha for cotton and bananas. The sales prices per kg are: Cocoa S / 6.4; S/0.70 Corn, Cotton and Banana S/1.2 S/0.50. The production amounts to 4TM cocoa 20TM corn, 12 tons of cotton and banana 100TM. Also in this community there are approximately 20 head of cattle. The selling price per head is S/.700.00.

Mojarras: The 31.82% is cocoa (70ha), with an average production of 400 kg / ha year and the sale price is S / . 6.4 kg. The 22.73% is maize (50 ha), with an average production of 2000 kg / ha. The sale price of corn is S/.0.70kg. The 18.18% (40 ha) is made of cotton and banana crops, respectively. The average production of cotton is 1200 kg / ha and the price is S/.1.20kg. The average production of banana is 10 MT / ha and the sale price is S/.0.50 kg. The 9.09% (20 ha) is orange crop, with production averaging 40TM/ha. The sale price is S/.0.20kg. Also, there are about 30 head of cattle.

Nueva Esperanza: The 25% is cocoa and corn (25ha), respectively. The average production of cocoa is 400 kg / ha year and the sale price is S / . 6.4 kg. The average maize production is 2000 kg / ha and the sale price is S/.0.70kg. The 20% is cotton and banana (20 ha), respectively. The average production of cotton is 1200 kg / ha and the sale price is S/.1.20kg. The average production of banana is 10TM/ha and the sale price is S/.0.50 kg. 10% corresponds to the cultivation of orange (10 ha), which on average produce 40TM/ha. The sale price is S/.0.20kg. In this community there are approximately 30 head of cattle and selling price per head is S/.700.00.

Pizarro: The 34.78% (80 ha) is cocoa, with an average production of 400 kg / ha year and selling price per kilogram of S / . 6.4. The 17.39% (40 ha) is maize and banana cultures, respectively. The average maize production is 2000 kg / ha and the sale price is S/.0.70kg. The average production of banana is 10 MT / ha and the sale price is S/.0.50 kg. The 21.74% (50 ha) is cotton. The average production is 1200 kg / ha and the price is S/.1.20kg. The 8.70% (20 ha) is orange crop, with production averaging 40TM/ha. The sale price is S/.0.20kg. Also, there are approximately 60 head of cattle, whose selling price per head is S/.700.00.

Primavera: The 31.03% (45 ha) is cocoa, with an average production of 400 kg / ha year and selling price per kilogram of S / . 6.4. The 20.69% (30 ha) is corn and banana cultures, respectively. The average maize production is 2000 kg / ha and the sale price is S/.0.70kg. The average production of banana is 10 MT / ha and the sale price is S/.0.50 kg. The 17.24% (25 ha) is cotton. The average production is 1200 kg / ha

and the price is S/.1.20kg. The 10.34% (15 ha) is orange crop, with production averaging 40TM/ha. The sale price is S/.0.20kg. Also, there are approximately 30 head of cattle.

San Juan de Pajaten: 25% (10 ha) is cocoa, corn, cotton and banana, respectively. The average production of cocoa is 400 kg / ha year and selling price per kilogram of S / . 6.4. The average maize production is 2000 kg / ha and the sale price is S/.0.70kg. The average production of banana is 10 MT / ha and the sale price is S/.0.50 kg. The orange is not a cash crop in this community. In San Juan del Abiseo, there are approximately 20 head of cattle.

San Juan del Abiseo: 40% (80 ha) is cocoa, with an average production of 400 kg / ha year and selling price per kilogram of S / . 6.4. The 17.78% (40 ha) is growing corn, cotton and banana cultures, respectively. The average maize production is 2000 kg / ha and the sale price is S/.0.70kg. The average production of cotton is 1200 kg / ha and the price is S/.1.20kg. The average production of banana is 10 MT / ha and the sale price is S/.0.50 kg. The 6.67% (15 ha) is orange crop, with production averaging 40TM/ha. The sale price is S/.0.20kg. In this community there is no cattle.

Santa Ines: The 29.17% (70 ha) is cocoa, with an average production of 400 kg / ha year and selling price per kilogram of S / . 6.4. The 20.83% (50 ha) is growing corn, cotton and banana cultures, respectively. The average maize production is 2000 kg / ha and the sale price is S/.0.70kg. The average production of cotton is 1200 kg / ha and the price is S/.1.20kg. The average production of banana is 10 MT / ha and the sale price is S/.0.50 kg. The 8.33% (20 ha) is orange crop, with production averaging 40TM/ha. The sale price is S/.0.20kg. Also, there are approximately 100 head of cattle.

G1.5.7 Remoteness and accessibility

Juanjui is 2 to 3 hours drive away from Tarapoto city and airport. Tarapoto is already in an isolated area of Peru, not easily accessible by road (20 to 30 hours drive from Lima). Alto Huayabamba producers are even more remote and only accessible by boat, 3 to 4 hours boat drive from Juanjui. This means transport has to be by boat to Juanjui.

During heavy rain season, Alto Huayabamba area is hardly accessible by boat as rough waters make it hard to go upstream. Producers are widespread along the river, each quite isolated on his field and without any motorized boat. To reach Juanjui, producers wait for the “taxi-boats” to take them and their cocoa.



Producers bring their goods and cocoa to the Juanjui market by “taxi-boat”

The taxi-boat cost 20 soles from Juanjui to Santa Rosa (when the minimum wage in the region is approximately 500 soles per month), it stops at every village three times a day. The more isolated producers have to reach those meeting points first.

To go downstream, the common use is to take rafts or rubber rings. It takes nine hours in raft to go from Santa Rosa to Juanjui where the main office of the cooperative and services are located. This is a regular trip for the communities' representatives.

G1.6. Description of the current land use, property rights

G.1.6.1. General land use and property rights conditions in project zone

For centuries the San Martin Province was a lightly populated, densely forested region with small patches of subsistence rain-fed agriculture and forest hunting and gathering. The province became a coca production stronghold from the 1980s through the mid-1990s due to its isolation, leading to migrants' invasions and massive deforestation.

A vast part of the land in San Martin Province has never been titled nor have boundaries been well-demarcated. Ownership has remained unclear, though this situation is changing as stakeholders struggle to claim the provinces forests. Under the Forestry Law, the vast majority of land in Peru is considered part of the National Forest Estate and under the management of the Forestry Administration. Forest Estate Demarcation, while a national priority, has only recently been undertaken.

Over the past 15 years, part of the forests have been cleared by coca producers, poorly managed forest concessions, oil exploitation companies, economic land concessions (ELCs), migrant settlers, and local communities working for land speculators. ELCs are a component of the government development strategy to attract private investment for the development of underutilized state public lands. In San Martin Province, ELCs are currently being mechanically cleared for rice, corn, papaya and sugarcane production. Local interviews indicated that Oil concessions and ELCs are often managed by a partnership of foreign and Peruvian businessmen.

In the last years, the regional government of San Martin has undertaken a program of progressive land titling for the farmers who do not own any legal land title (~50% in the case of ACOPAGRO members). Pur Projet helped ACOPAGRO to sign a contract with the regional government authority in charge of land titling to prioritize titling of producers involved in both reforestation and REDD projects in the Huayabamba river basin. The goal is to have all ACOPAGRO member legally titled by end of 2012.

In 2011, the regional government also decided to suspend all attributions of oil and mining concessions in the region, switching to a more environmental philosophy of land dedication to conservation purposes.

G.1.6.2. Land tenure in the project area

The project area is constituted by 3 concessions for conservation (Martin Sagrado, El Breo, Monte Cristo), solicited respectively by ACOPAGRO, Asociacion Dos De Mayo, and APAHUI.

These are concessions given upon solicitation by the regional government for a period of 40 years (renewable), with the sole purpose of conservation. The concessionaires must solicitate the concession first, building a technical file describing the area, the conservation stakes, and are given the concession after a public comment period of 3 months where communities can contest the concession. Once obtained, the concessionaires must submit within 3 years a detailed management plan for the concession, and the conservation activities will be monitored every 5 years by the government, which can reclaim back the concession in case of non-respect of the conditions.

The Asociacion Dos de Mayo already has the concession El Breo, and is in currently building the management plan for complete attribution of the concession.

ACOPAGRO has solicited the concession Martin Sagrado. The public comment period has just finished (December 2011), and ACOPAGRO will receive the concession title.

APAHUI is in the process of soliciting the Monte Cristo concession, and is currently (December 2011) building the technical file for solicitation.

It is part of the REDD project activities (even the first priorities) to help the communities and organizations in the process of securing land tenure over the project area.

Once the concessions have been attributed, there are no longer possibilities for disputes within the San Martin Region

G1.7. Biodiversity information

G1.7.1 Terrestrial Ecological Systems – SETs

The Data Center for Conservation - UNALM & TNC (2006), using biophysical models from different inputs and different methods, identifies and describes the terrestrial ecological systems (SET) of the Peruvian Yungas.

At coarse filter level (ecosystem level), within the Peruvian Yungas Ecoregion, the CDC-UNALM identified 18 SETs as conservation targets (CDC-UNALM and TNC, 2006). The SETs are defined as "groups of plant communities that tend to co-occur in the landscape due to its relationship with common factors and determinants and ecological processes, substrates and / or environmental gradients" (Josse et al., 2007:11). The use of SETs to evaluate the effectiveness of conservation has many advantages because it combines in one system: ecological, dominant vegetation and landforms.

Applying the digital map material produced by superimposing the reference and the proposed area coverage using the program Arc View 3.3, **09 types of SETs** have been identified as priority conservation targets for the project area, which are detailed in the General information G1.2 "The types and condition of vegetation within the project area".

These units synergistically complement those already included in the Abiseo River National Park and the Concession for Conservation "Alto Huayabamba," forming a more robust and resilient block to global climate changes to come.

G1.7.2 Flora inventory in the reference project area

Table 6 : List of species of flora listed in the inventory

FLORA		
Angiospermae	Families	Species
	PROTEACEAE	<i>Oreocallis grandiflora</i> (Lam.) R. Brown "saltaperico", "cucharilla"
	OLACACEAE	<i>Heisteria acuminata</i> (H.B.K.) Engler "chuchuhuasi"

	SANTALACEAE	<i>Cervantesia tomentosa</i> R. & P.
	POLYGONACEAE	<i>Muehlenbeckia volcanica</i> (Benth.) Endlicher "mullaca"
		<i>M. tamnifolia</i> (H.B.K.) Meiss "bejuco"
		<i>Polygonum aviculare</i> L. "pica pica"
		<i>P. hydropiperoides</i> Michaux "pica pica"
		<i>Rumex acetocella</i> L. "lengua de vaca"
		<i>R. crispus</i> L. "lengua de vaca"
		<i>R. conglomeratus</i> Murray "lengua de vaca"
		<i>R. obtusifolius</i> L. "lengua de vaca"
		<i>Triplaris peruviana</i> Fisch. & Meyer ex C.A. Meyer
	CHENOPODIACEAE	<i>Chenopodium ambrosioides</i> L. "paico"
		<i>C. murale</i> L. "hierba gallinazo"
		<i>C. pallidicaule</i> Aellen "cañigua"
		<i>C. quinoa</i> Willd. "quinua"
	AMARANTHACEAE	<i>Alternanthera elongata</i> (Willd. ex Roem. & Schultes) Schinz "hierba"
		<i>A. macbridei</i> Standley "yahuar milckay"
		<i>A. porrigens</i> (Jacq.) Kuntze "moradilla"
		<i>Amaranthus caudatus</i> L. "kiwicha"
		<i>Guilleminea densa</i> (Willd.) Moq. <i>Iresine difusa</i> H.B.K. ex Willd.
	ANNONACEAE	<i>Unonopsis gatterioirdes</i> (A.DC.) R.E. Fries
	MONIMIACEAE	<i>Siparuna pyricarpa</i> (R. & P.) Perkins
		<i>S. weberbaueri</i> Perkins "limoncillo"
	LAURACEAE	<i>Endlicheria bracteata</i> Mez "canela moena"
		<i>Nectandra cissiflora</i> Nees "muina"
		<i>Ocotea balanocarpa</i> Mez. "muena"
		<i>Persea caerulea</i> (R. & P.) Mez.
		<i>Pleurothyrium cuneifolium</i> Nees "canela muena"
	PIPERACEAE	<i>Peperomia ferreyrae</i> Yuncker "peperomia"
		<i>P. galioides</i> H.B.K. "peperomia"
		<i>P. hilli</i> Trelease "peperomia"
		<i>P. obtusifolia</i> (L.) A. Dietrich "peperomia"
		<i>Piper aduncum</i> L. "matico"
		<i>P. corpunya</i> R & P. "matico"
		<i>P. moho moho</i> C. DC. "matico"
		Y otras especies de Piper y Peperomia probablemente nuevas para la
	PAPAVERACEAE	<i>Bocconia integrifolia</i> H & B. "pincullo"
		<i>Bocconia pearcei</i> Hutchison "pincullo"
	BRASSICACEAE	<i>Rorippa nasturtium-aquaticum</i> (L.) Hayek "berro"
	ROSACEAE	<i>Rubus roseus</i> Poir "zarzamoras"
		<i>R. acanthophyllus</i> Focke "fresas"

	FABACEAE	<i>Amburana cearensis</i> (Allem & Atilde) A.S. Smith "ishpingo"
		<i>Astragalus garbancillo</i> Cav. "garbancillo"
		<i>Cedrelinga cateniformis</i> Ducke "tornillo"
		<i>Caesalpinia sepiaria</i> Roxb "caesalpinia"
		<i>Dalea cilíndrica</i> Hook. "dalea"
		<i>Desmodium limense</i> Hook "pie de perro"
		<i>Erythrina peruviana</i> Krukoff "pajuro"
		<i>Indigofera tephrosioides</i> Kunth "añil"
		<i>Medicago lupulina</i> L. "alfalfilla"
		<i>M. polymorpha</i> L. "alfalfilla"
		<i>Melilotus indica</i> (L.) All. "alfalfilla"
		<i>Otholobium glandulosum</i> (L.) J.W. "culén"
		<i>O. mexicanum</i> Grimes "culén"
		<i>Senna birostris</i> (Dombey ex J. Vogel) Irwin & Barneby
		<i>Trifolium amabile</i> Kunth "chijape", "trébol"
	<i>Vicia andicola</i> Kunth "alberjilla"	
	GERANIACEAE	<i>Erodium cicutarium</i> (L.) L'Herit ex Aiton "alfiler"
		<i>E. malacoides</i> (L.) L'Herit & Eacute "alfiler"
		<i>E. moschatum</i> (L.) L'Herit & Eacute ex Aiton "alfiler"
		<i>Geranium sessiliflorum</i> Cav. "ojotilla"
	ERYTHROXYLACEAE	<i>Erythroxylum coca</i> Lam. "coca"
	EUPHORBIACEAE	<i>Chriopetalum ruizianus</i> (muell. Arg.) Pax & Hoffm.
		<i>Croton alnifolius</i> Lam. "crotón"
		<i>C. lechlerii</i> Muell. Arg. "sangre de grado"
		<i>C. palanostigma</i> Klotzsch "sangre de grado"
		<i>C. ruizianus</i> Muell. Arg "cabra cabra"
		<i>Dalechampia aristolochiaefolia</i> Kunth
		<i>Euphorbia huachanhana</i> (Klotzsch & Grarcke) Boiss
		<i>Hura crepitans</i> L. "habilla"
	MELIACEAE	<i>Sebastiania obtusifolia</i> (H.B.K.) Pax & Hoffm.
		<i>Cedrela odorata</i> L. "cedro"
	MALVACEAE	<i>Swietenia macrophylla</i> "caoba"
		<i>Malva parviflora</i> L. "malva"
<i>Sida rhombifolia</i> L. "sida"		
BOMBACACEAE	<i>Urocarpidum macrocerpum</i> Krap. "malva"	
PASSIFLORACEAE	<i>Ceiba insignis</i> (Kunth) Gibas & Semir "barrigón"	
	<i>Passiflora huamachucoensis</i> L.K. Escobar	
	<i>P. ligularis</i> Juss. "granadilla"	
	<i>P. peduncularis</i> Cav. "cholgama"	
	<i>P. tripartita</i> var. <i>mollissima</i> (Kunth) Hola. Nielse & Jorgense "poro poro"	
CARICACEAE	<i>Vasconcellea candicans</i> (Gray) A. DC. "papaya"	
	<i>V. heterophylla</i> (Gray) DC. "papaya"	

	BEGONIACEAE	<i>Begonia hirtella</i> Link “begonias”
		<i>B. acerifolia</i> Kunth “begonias”
		<i>B. octopetala</i> L’Herit. “begonias”
		Y probables especies nuevas para la ciencia.
	MELASTOMATACEAE	Existen varias especies por determinar, posiblemente nuevas para la ciencia.
	RUBIACEAE	<i>Arcytophyllum tymifolium</i> (R. & P.) Standl.
		<i>Cinchona pubescens</i> M. Vahl. “cascarilla”
		<i>C. micrantha</i> R. & P. “cascarilla”
		<i>Galium aparine</i> L.
		<i>Manettia peruviana</i> Standl.
		<i>Palicourea macrobotrys</i> (R. & P.) Roem & Schult (otras especies más)
		<i>Psychotria caerulea</i> R. & P. (otras especies más)
		<i>Randia obovata</i> R & P.
		<i>R. killippi</i> Standl.
	VERBENACEAE	<i>Aloysia tripilla</i> (L’Herit) Britton “cedrón”
		<i>Cytharexylum flexuosum</i> R. & P.) D. Don
		<i>Duranta membranacea</i>
		<i>Lantana armata</i> Schauer “lantana”
		<i>L. camara</i> L. “lantana”
		<i>L. reptans</i> Hayek “lantana”
		<i>Stachytarpheta cayennensis</i> (Rich) M. Vahl
		<i>Verbena cuneifolia</i> R. & P. “verbena”
		<i>V. litorales</i> Kunth “verbena”
		<i>V. fasciculata</i> Benth “verbena”
	SOLANACEAE	<i>Acnistus arborescens</i> (L.) Schltdl. “chimulala”
		<i>A. umbellatus</i>
		<i>Browalia americana</i> L. “ flor de mayo”
		<i>Brugmansia arborea</i> (L.) Lagerth “floripondio blanco”
		<i>B. sanguinea</i> (R.&P.) D.Don “puca campanilla”, “floripondio rojo”
		<i>Cestrum auriculatum</i> L’Herit “hierba santa”
		<i>C. strigilatum</i> R. & P. “hierba hedionda”
		<i>Cyphomandra betacea</i> (Cav.) Sendtn “berengena”
		<i>Dunalia spinosa</i> (Mey.) Dammer “espino”
<i>D. umbellata</i> (Dunal) J.F. Macbr.		
<i>lochroma calycinum</i>		
SOLANACEAE	<i>I. grandiflorum</i> Benth “campanilla”	
	<i>I. umbellatum</i> (R.&P.) Hunziker ex D’Arcy “shirac”	
	<i>Jaltomata biflora</i> (R. & P.) Benitez , y otras especies más	
	<i>Larnax</i> género con varias especies	

		<i>Nicandra physalodes</i> (L.) Gaertn “capulí cimarrón”
		<i>Nicotiana glauca</i> Graham “tabaco silvestre”
		<i>N. glutinosa</i> L. “tabaco silvestre”
		<i>N. paniculata</i> L. “tabaco cimarrón”
		<i>Physalis peruviana</i> L. “tomate silvestre”, “aguaymantu”
		<i>Salpichroa ramosissima</i> Miers. “cuytulumbo”
		<i>S. tristris</i> Miers.
		<i>Solanum abitaguense</i> S. Knapp “papa de zorro”
		<i>S. bukasovii</i> Rybin “papa de zorro”
		<i>S. jalcae</i> Ochoa “papa de zorro”
		<i>S. trinitense</i> Ochoa “papa de zorro”
		<i>S. sesile</i> R. & P. “papa de zorro”
		<i>Streptosolem jamesonii</i> (Benth) Miers.
	PLANTAGINACEAE	<i>Plantago lanceolata</i> L. “llantén”
		<i>P. limensis</i> Pers “llantén”
		<i>P. rigida</i> Kunth “llantén”
	CAPRIFOLIACEAE	<i>Sambucus peruviana</i> Kunth “saúco
		<i>Viburnum ayavacense</i> H.B.K.
		<i>V. triphyllum</i> Benth
	VALERIANACEAE	<i>Phyllactis rigida</i> (R. & P.) Pers. “valeriana estrella”
		<i>Valeriana candolleana</i> Gardner “valeriana”
		<i>V. clematitidis</i> H.B.K. “valeriana”
		<i>V. decussata</i> R. & P. “polo polo”
		<i>V. mirophylla</i> Kunth “valeriana”
		<i>V. pinnatifida</i> R. & P. “alberjilla”
	ASTERACEAE	<i>Achyrocline alata</i> (H.B.K.) DC. “espingo de oro”, “huira huira”
		<i>Ageratina azangaroensis</i> (Schultz-Bip ex Wedd.) King & H. Rob. “huarmi huarmi”
		<i>Bidens andicola</i> H.B.K. “amor seco”
		<i>B. pilosa</i> L. “amor seco”
	BROMELIACEAE	<i>Aechmea mertensii</i> (Mey) Schult. f
		<i>Bromelia varias</i> especies
		<i>Guzmania strobilanthes</i> (R. & P.) Mez
		<i>G. monostachia</i> (L.) Rugby ex Mez
		<i>Greigia macbrideana</i> L.B.Sm.
		<i>Pitcairnia ferreyrae</i> L.B. Sm.
		<i>P. paniculata</i> (R. & P.) R & P.
		<i>Puya fulgens</i> L. B. Sm. Y varias especies más
	BROMELIACEAE	<i>Tillandsia capillaris</i> R. & P.
		<i>T. latifolia</i> Mey
	BROMELIACEAE	<i>T. sagasteguii</i> L.B. Sm.
		<i>T. seemannii</i> (Baker) Mez

		<i>T. tectorum</i> E. Rorren
		Y otras especies más.
	ARECACEAE	<i>Ceroxylon crispus</i> Burret
		<i>Wettinia augusta</i> Poepp & Endl.
		<i>Prestoea acuminata</i> (Willd.) Moore
		<i>Carludovica palmata</i> R. & P. "bombonaje", "
	CYCLANTHACEAE	<i>Cyclanthus bipartitus</i> Poit. "sangapilla"
		<i>Anthurium soukupii</i> (con varias especies más)
	ARACEAE	<i>Colocasia esculenta</i> (L.)Schott "pituca"
		<i>Phylodendron</i> con varias especies más
		<i>Heliconia</i> con varias especies más
	MUSACEAE	<i>Heliconia</i> con varias especies más
ORCHIDACEAE	Muchos géneros y especies (algunos muy novedosos)	

Details on tree species

Peru is the third largest extent of tropical forest in the World, after Brazil and the Republic of Congo. It counts 2500 species of native tree species of which 33 are critically endangered, 14 endangered and 54 vulnerable. (Source: Mongabay.com, 2010)

Hereunder, a brief description of the most important timber species present in the area, and their characteristics from plantation to maturity (source : Universidad La Molina, Peru)

a) *Swietenia macrophylla* - Mahogany

Habitat: sites with high rates and persistent rainfall; despite being intolerant to long term droughts, it also happens in areas with a remarkable dry season. Specie usually developed in light, loamy to sandy soils with good fertility conditions, well drained and medium stoned. Fructification: usually near to the end of the year. Seed dispersion: by means of the wind; medium distances of 32 to 36m and a maximum of 95 up to 100m. Germination: 54 to 95% of germination for fresh seeds on average environmental conditions. Said rate is reduced to 30% within 60 days on average environmental conditions. Growing conditions: seedlings are planted every 3m (3m x 3m) up to 7m x 4m. The recommended rotation is of 35-40 years. In well-fertilized alluvial soils, very fast growths were reported, reaching at the age of 3 years diameters of 15-20cm. Growing/Mortality rate: 1.8m of height is reached by the trees since their plantation up to their first year; diameters of 6-27cm in 6-12 years respectively and 15-20m of height in 7-12 years respectively.



b) *Cedrela odorata* – Cedar

Habitat: sites with high rates and persistent rainfall but also in areas with a remarkable dry season. Specie usually developed in clayey to sandy soils with normal fertility conditions, well drained and sometimes highly stoned. Fructification: near to the end of the dry season, but also during the whole year. Seed dispersion: by means of the wind. Germination: 60-70% of germination for fresh seeds on average environmental conditions. Seeds should be sowed directly in nursery beds with a mixed substrate of sand and soil, at half shadow.

Growing conditions: seedlings with their substrate are transplanted to the field, considering a 4m distance between one plant and the other. Plantation areas are of alluvial soils, loam-sandy to clayey, flat or with low slopes. Growing/Mortality rate: 2-4cm/year is the average growing rate; reaching 4-5m of height in 7-11 years respectively. This specie has showed a good survival rate in the in-field tests carried out by the concessions (70%).



c) *Manilkara bidentata* – Quinilla

Habitat: sites with high rates and persistent rainfall. Specie usually developed in clayey to slimy soils, mainly acid, well drained and medium stoned. Fructification: since the end of the dry season up to the start of the rainy one, between September and January. Seed dispersion: by means of fauna species: monkeys and bats. Some rodents also disperse seeds of fallen fruits.

Germination: on the one hand this specie has a good germination rate, but on the other hand it germination power is low, reaching only a 20% and loosing it in 1 or 2 months. Growing conditions: seedlings with their substrate are transplanted to the field. The area of plantation is a high terrace with alluvial soils, loam-sandy and mainly flat. Growing/Mortality rate: the average annual diametric growth is of 6-10 at the 7-10th years of plantation respectively and the average height reached in the same period of time is of 6-7m. The survival rate is high, 70-90% without any maintenance activities. A thinning-out was tested in the 7th year of plantation with good results on the faster diametric increase of the individuals.



d) *Dipteryx* spp. – Shihuahuaco

Habitat: sites with high rates and persistent rainfall, but also in areas with a remarkable dry season. Specie usually developed in clayey to slimy soils, well drained, with good fertility conditions and medium stoned. Fructification: at the end of the dry season. Seed dispersion: mainly by means of bat species (*Artibeus jamaicensis*, *Artibeus lituratus* and *Carollia* spp.), which get and then take the fruits to safe places to eat them quietly. Some monkey species (*Ateles* spp.) and large rodents (*Dasyprocta* spp. and *Myoprocta* spp.) could also act eventually as seed spreaders.



Germination: getting 79-80% of germination power. Growing conditions: good initial growth in alluvial, well-drained soils. Growing/Mortality rate: an average annual increase of 1m of height in a 3 year plantation was registered, on alluvial and well-drained soils. On the other hand, average annual increases of 0.57m of height in an 8 year plantation were registered in a Forest Reserve in Ducke, Manaus, Brazil.

e) *Amburana cearensis* – Ishpingo

Habitat: sites with high rates and persistent rainfall, but also in areas with a remarkable dry season. Specie usually developed in clayey to slimy soils, well drained and medium stoned. Fructification: during the dry season, between July and August. Germination: good rate. Growing/Mortality rate: despite the growing rate is apparently slow, in a 3 year plantation established in the Pucallpa height growths of 1.5-1.6m were registered.



f) *Eschweilera coriacea* – Misa

Habitat: sites with high rates and persistent rainfall. Specie usually developed in clayey soils, mainly acid, well drained, sometimes with poor fertility conditions and low stoned. Fructification: during the rainy season, between January and March. Germination: good rate. Growing conditions: not tested yet. Plantation should be made with bare root and also by no till plantation.

Growing/Mortality rate: slow growing rate; volumetric increases of about 1000m³/ha/year.

g) *Apuleia leiocarpa* – Ana caspi

Habitat: sites with high rates and persistent rainfall, but also in areas with a remarkable dry season. Specie highly adaptable to different textures and fertility conditions of soils, well-drained and medium stoned. Fructification: during the rainy season, between November and March. Germination: good rate in seeds with a pre-germination treatment, reaching 90% of germination power. In fresh seeds without treatment the percentage is lower, around 20%.



h) *Aspidosperma parvifolium* – Quillobordón

Habitat: sites with high rates and persistent rainfall. Specie usually developed in clayey to slimy soils, well drained and medium stoned. Fructification: at the start of the rainy season, between November and December. Seed dispersion: by means of the wind, winged seeds. Germination: seed propagation is successful. Growing conditions: the area of plantation is a high terrace with alluvial, loam-sandy soils, flat or with a light slope.

Growing/Mortality rate: the average annual diametric increase is of 8-11cm in plantations of 10-14 years respectively. The average height reached at the age of 14 is 10m. The survival rate is low, around 20%.

i) *Brosimum lactescens* – Manchinga

Habitat: sites with high rates and persistent rainfall. Specie usually developed in clayey to slimy soils, slightly acid, well drained and medium stoned. Fructification: at the end of the dry season, in October. Seed dispersion: by means of bird and mammal species, which eat the fallen fruits. Among them, it should be highlighted *Mozama Americana* (Venado), *Tayassu spp.* (Pecarías) and some rodents. Germination: reaching 98% of germination power for fresh seeds, but only 25% for seeds that had been collected 15 days before. Growing conditions: seedlings with their substrate are transplanted to the field, with 2m distance between one plant and the other (2mx2m). The areas of plantation are high terrace, mostly flat and of loam-sandy to loam-silty soils. Growing/Mortality rate: the survival rate is medium, around 52% in-field and 55-73% under shadow.



j) *Ruagea insignis* – Requia

Habitat: sites with high rates and persistent rainfall but also in areas with a remarkable dry season. Specie highly adapted to a varied range of soils in terms of texture, acidity and fertility conditions; sometimes temporarily flooded areas and also next to the rivers.

Fructification: there are flowers and fruits during the whole year, but it seems to be more fructification at the end of the rainy season, between March and April. Seed dispersion: by means of bird species, which are attracted by the intense red color of the seeds. Also some monkey specie and maquisapas (*Ateles spp.*) eat said fruits and therefore participate in the seed dispersion. Germination: reaching 40-58% of germination power in fresh seeds.

k) *Terminalia oblonga* – Yacushapana

Habitat: sites with high rates and persistent rainfall but also in areas with a remarkable dry season. Specie usually developed in loam to loam-sandy soils, neutral to acid, well drained and sometimes highly stoned. Fructification: during the dry season up to the start of the rainy one, between May and December. Seed dispersion: by means of the wind. Germination: reaching 80% of germination power in fresh seeds. Growing conditions: seedlings with their substrate are transplanted to the field after 8-12 months of plantation. Root pruning and the removal of some foliage is recommended before the in-field planting. Growing/Mortality rate: Costa Rica registers state a diametric increase of 13cm and a height increase of 12m in a 14 year plantation of Yacushapana.



l) *Copaifera reticulata* – Copaiba

Habitat: sites with high rates and persistent rainfall. Specie usually developed in clayey to slimy soils with good fertility conditions, well drained and medium stoned. Fructification: since the end of the dry season up to the start of the rainy one, between September to January. Germination: reaching 31-78% of germination power in fresh seeds. Growing/Mortality rate: registers made in Brazil for a congenus specie *Copaifera langsdorfii* show slow growth rates, with diameters of 9-11cm in average reached in 14-25 years and heights of 9-12m in the same period. The survival rate is very high, around 90%.



m) *Myroxylon balsamum* – Estoraque

Habitat: sites with high rates and persistent rainfall but also in areas with a remarkable dry season. Specie developed in primary forests, on clayey to slimy soils with good fertility conditions, well drained and variably stoned. Fructification: next to the end of the dry season, but also during the whole year. Seed dispersion: by means of the wind; fruits are samaras. Additionally, some parrot species could also participate in the seed dispersion. Germination: reaching 60-75% of germination power in fresh seeds.

Growing conditions: characteristic specie in primary forests, mainly on high terrace or low hills zones and on rich and well-drained soils. Growing/Mortality rate: registers made in Brazil for a congenus specie *Myroxylon peruiferum* show slow growth rates, with diameters of 6-7cm in 14 years and heights of 6-7m in the same period. The survival rate is very high, around 90%.



G.1.7.3 Fauna within the project zone

Diverse species of mammals, birds, reptiles and amphibians are observed, as well as numerous species of invertebrates. Within the project zone over 160 mammal species, 324 bird species, 26 butterfly species, 106 reptile species, 123 amphibian species exist, as well as many other species of invertebrates have been identified

Among the most representative species present in the surroundings the following should be highlighted:

Sachavaca (*Tapirus terrestres*), venado colorado (*Mazama americana*), majaz (*Agouti paca*), añuje (*Dasyprocta variegata*), conejo silvestre (*Sylvilagus brasiliensis*), oso hormiguero (*Myrmecophaga tridactyla*), armadillo gigante (*Priodontes maximus*), carachupa (*Dasybus novemcinctus*), puma (*Felis concolor*), otorongo (*Panthera onca*), mancos (*Eira barbara*), perro de monte (*Atelocynus microtis*), mono leoncito (*Cebuella pygmaea*), pichico de barriga naranjada (*Saguinus labiatus*), musmuqui (*Aotus nancymaeae*), maquisapa (*Ateles paniscus*), as well as dangerous reptiles as shushupe (*Lachesis muta*), naca naca (*Micrurus sp*), mantona (*Boa constrictor*) and “quelónidos” as the motelo (*Geochelone denticulada*), taricaya (*Podonemis sp*), birds as the harpia (*Harpia harpia*), Cóndor de la selva (*Sarcoramphus papa*), Guacamayo (*Ara macao*), Paujil (*Mitu tuberosa*), Tucan (*Ramphastos cuvieri*), Paguana (*Crypturellus undulatus*), pucacunga (*Penelope jacquacu*) and manacaraco (*Ortalis guttata*).

G1.8. High Conservation Values (HCVs) and description of the qualifying attributes

The World Wild Fund for Nature has delineated three yungas ecoregions along the eastern side of the Andes. San Martin Region is located in the northernmost one (Peruvian Yungas). These yungas ecoregions are transitional zones between the Andean highlands and the eastern forests. The yungas forests are extremely diverse, ranging from moist lowland forest to evergreen montane forest and cloud forests. The terrain is extremely rugged and varied, contributing to the ecological diversity and richness. A complex mosaic of habitats occurs with changing latitude as well as elevation. There are high levels of biodiversity and species endemism throughout the yungas regions. Many of the forests are evergreen, and the South Andean Yungas contains what may be the last evergreen forests resulting from Quaternary glaciations.

Within the different forest types listed above there are areas of High Conservation Value (HCV), divided into areas of biological and cultural significance. Biological HCV areas include the primary forest of the project area, composed primarily of evergreen forest. Due to the presence of several IUCN listed threatened species in the project area (see previous section), the project area can be designated as a biological HCV area.

Hereunder, a summary of the existent biodiversity conditions within Martin Sagrado project area at the starting date of the REDD Project, as well as the conditions in its immediate surroundings defined by the leakage belt determined in the present REDD Project.

It is based on the results of a series of studies related to the biophysical and biodiversity conditions of the area as well as communities observations and feed-back. Said documents represent a joint effort made by the communities and their partners with the aim to achieve the sustainable management of their forests, using the accumulated knowledge of the biodiversity component of the project.

G1.8.1. Globally, regionally or nationally significant concentrations of biodiversity values

G1.8.1 a. Protected areas

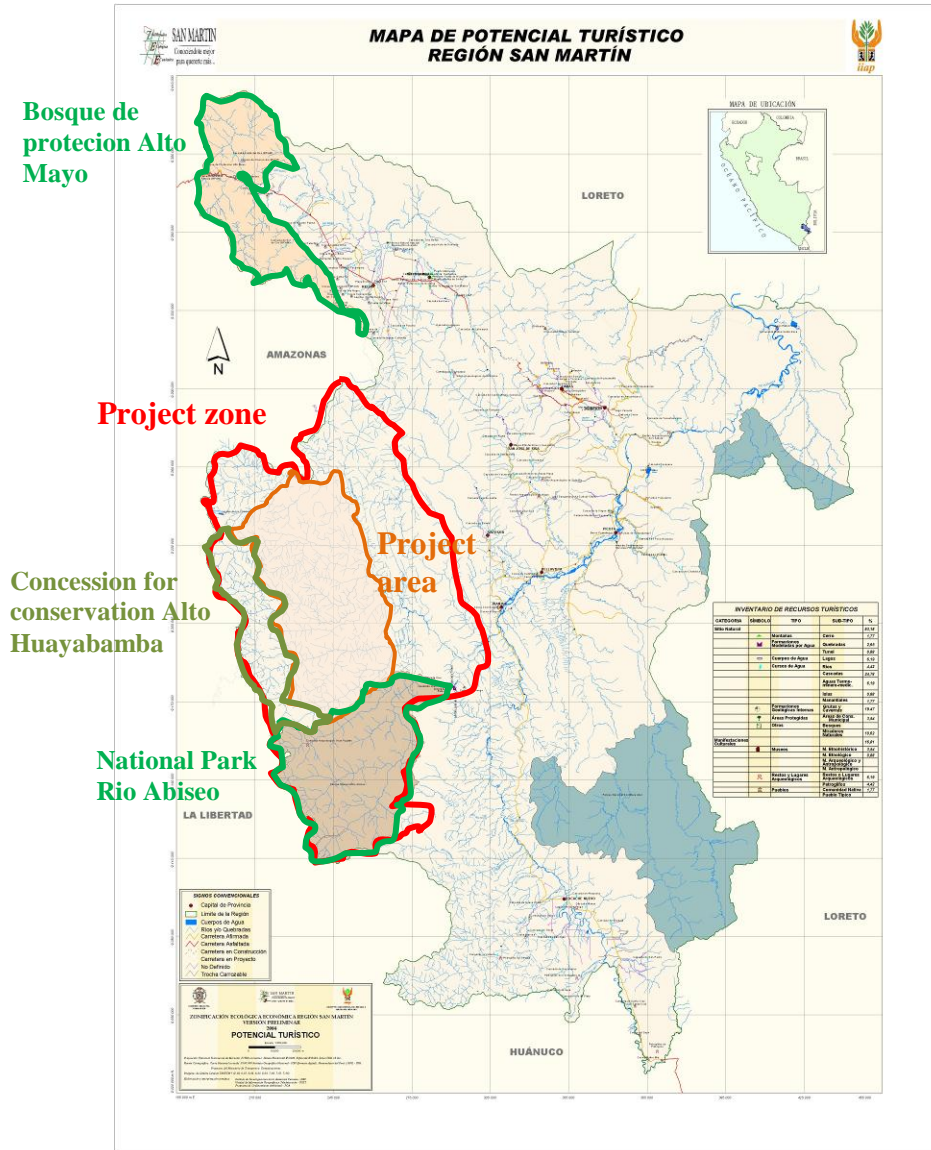
The National Park Rio Abiseo is the major protected area in the project zone. It encompasses 274520 hectares of rainforest. The National Park was established in 1983; UNESCO pronounced it as Natural and Cultural Heritage of Humanity (World Heritage Site) in 1990. The park is home to a large number of species of flora and fauna, as well as the location of over 30 pre-Columbian archaeological sites. Since 1986, the park has not been open to tourism due to the fragile nature of both the natural and archaeological environment.

Other conservation areas include the Concession for Conservation Alto Huayabamba, attributed to the NGO AMPA in 2006. Located on the most western part of San Martin Region, in the highest part of the Andes, it encompasses 143 928 hectares of mostly high Andean ecosystems.

Just outside the project zone, to the north of San Martin region, across the boarder with Amazonas region is the "Bosque de protection Alto Mayo", a forest conservation area created in 1987, encompassing 182 000 hectares of forest.

The project area completes a major role in the connectivity between the Abiseo River National Park and the "Bosque de Proteccion Alto Mayo", and as part of the more global Conservation Corridor for Abiseo - Condor - Kutukú, considered as high priority for conservation and nucleus of one of the centers of high diversity ("Biodiversity hotspots") in the Tropical Andes

Figure 19 : Map of protected areas and conservation corridor



G1.8.1 b. Threatened species

Based on current legislation and lists of endangered species worldwide (IUCN) the following species have been registered and have a high probability of occurrence in the project area (CDC-UNALM and TNC, 2006; Angulo et al. 2008; AMPA, 2009). They are displayed here according to their threat level according to INRENA, IUCN and CITES.

TABLE 7 : Endangered species in the proposed project zone

ESPECIES	GRADO DE AMENAZA		
	PERU	UICN	CITES
FLORA			
<i>Cyathea spp.</i> "helecho arbóreo"	--	--	II
<i>Podocarpus oleifolius</i> "saucecillo"	CR	LC	--
<i>Ceroxylon crispum</i> "palma de cera"	VU--	--	--
<i>Cedrela odorata</i> "cedro"	VU	VU	III
<i>Cedrela montana</i> "cedro"	VU--	--	--
<i>Cedrela lilloi</i> "atoc cedro"	EN	EN	--
<i>Swietenia macrophylla</i> "caoba"	VU	VU	II
<i>Polylepis multijuga</i> "quinoa"	EN	VU	--
<i>Juglans neotropica</i> "nogal"	NT	EN	--
FAUNA			
Aves			
<i>Aulacorhynchus huallagae</i> "tucancito semiamarillo"	EN	EN	--
<i>Aburria aburri</i> "pava negra"	NT	NT	--
<i>Hemispingus rufosuperciliaris</i> "hemispingo cejirufo"	VU	VU	--
<i>Leptosittaca branickii</i> "loro de mejillas doradas"	VU	VU	II
<i>Thripophaga berlepschi</i> "rabiblando bermejo"	EN	VU	--
Mamíferos			
<i>Oreonax flavicauda</i> "mono choro de cola amarilla"	EN	CR	I
<i>Aotus miconax</i> "mono nocturno"	EN	VU	II
<i>Callicebus oenanthe</i> "mono tocon andino"	VU	EN	II
<i>Pudu mephistophiles</i> "sachacabra"	EN	VU	II
<i>Tremarctos ornatus</i> "oso de anteojos"	EN	VU	I
<i>Panthera onca</i> "otorongo"	-	VU	I
<i>Tapirus terrestris</i> "sachavaca"	-	-	II

Elaborated by AMPA. Source. UICN 2008, CITES, PERU 2004 y 2006.

The International Union for Conservation of Nature (UICN 2008), brings together a diverse panel of experts who evaluated and ranked based on species extinction. The categories used are: Extinct (EX), Extinct in the Wild (EW), Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT), Least Concern (LR), Data Deficient (DD) and Not Evaluated (NE). The species listed in categories CR, EN and VU are considered threatened.

Consistent with the model used by the IUCN, nationally, equivalent categories are used to this international system. Thus, the categorization for threatened fauna in Peru is under the aegis of Supreme Decree N ° 034-2004-AG, which defines threat categories as follows: Critically Endangered (CR), Endangered (EN) , Vulnerable (VU), Near Threatened (NT). In the case of plants, the categorization comes under Supreme Decree No. 043-2006-AG, which employs categories equal to the categories of animals indicated above. The CITES (Convention on International Trade in Endangered Species) includes

in its appendices to those species that have undergone some drastic changes or decrease in abundance due to excessive hunting or trade of their products, such as skins, teeth and bones. CITES Appendix considers three categories:

- Appendix I includes all species of animals and plants who bear an increased risk of extinction, CITES generally prohibits the international trade in specimens of these species. However, trade may be permitted in exceptional circumstances the same, eg for scientific research.
- Appendix II includes species not necessarily threatened with extinction but could become, unless strictly controlled trade, international trade in specimens of these species may be authorized to grant an export permit or re-export certificate, not must have an import permit.
- Appendix III includes species included at the request of a country that already regulates trade in the species and requires the cooperation of other countries to prevent unsustainable or illegal exploitation of the same, including species regulated for conservation purposes by individual countries.

In the project area, we have a list of 21 species found in any of the lists of threatened species nationally and internationally, or are listed in the Appendices to CITES. Undoubtedly, this list highlights the endemic monkeys *Oreonax flavicauda* (yellow-tailed woolly monkey) and *miconax Aotus* (night monkey), and endemic birds *Aulacorhynchus huallagae* (Toucanet semiamarillo) *Thripophaga berlepschi* (rabiblando vermilion) and *Hemispingus rufosuperciliaris* (hemispingo cejirufu). On the other hand, in terms of flora highlight what we believe are the populations of mahogany mountains and the rare saucecillo (*Podocarpus oleifolius*). Although, these species have some level of protection in places like the Rio Abiseo National Park, has always been calling for the extension of the protection zones of these endemic species (CDC-UNALM and TNC, 2006). We believe the project addresses this need for expansion of habitat for these species are endemic.

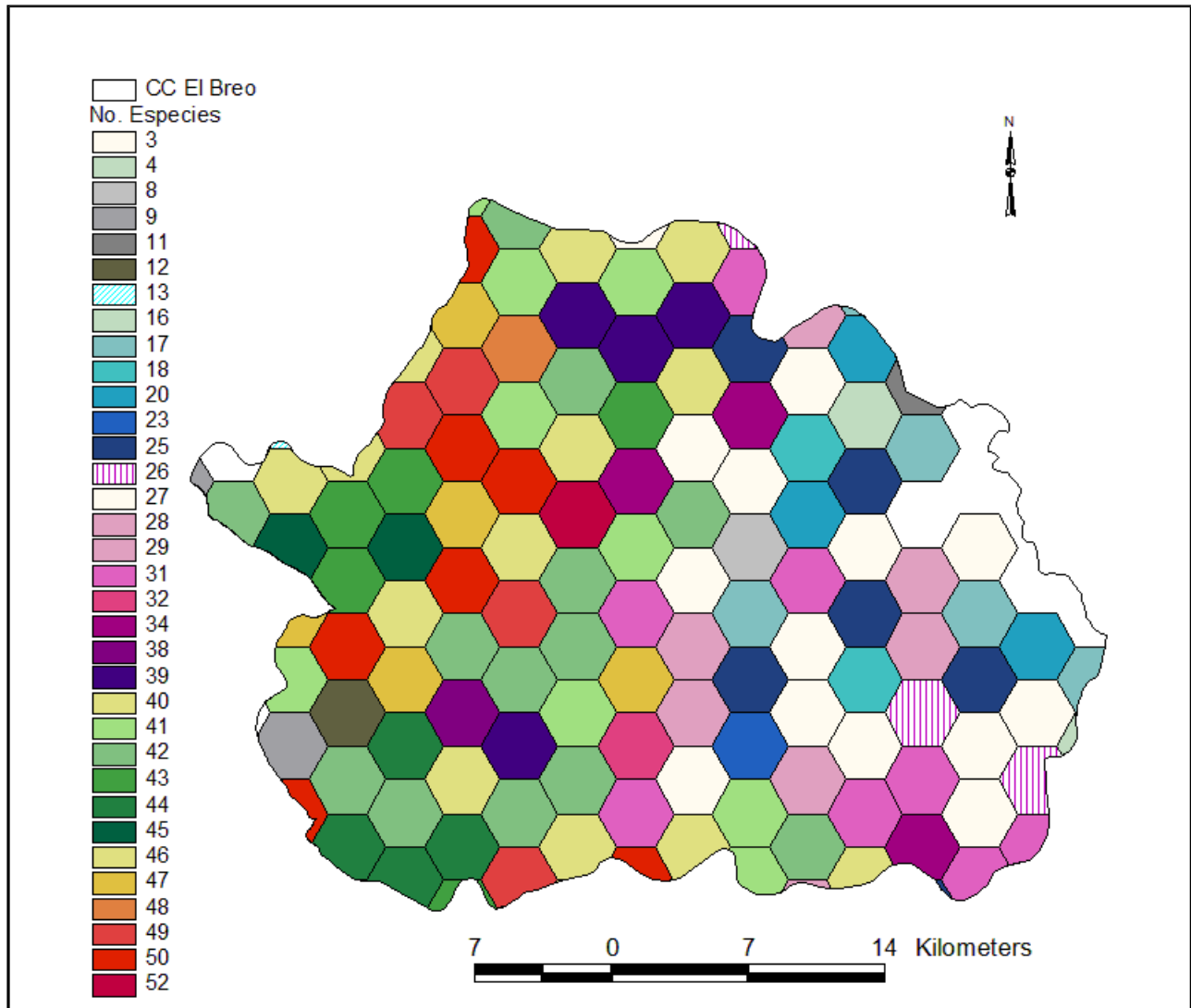
G1.8.1 c. Distribution and occurrence of endemic species

Diverse species of mammals, birds, reptiles and amphibians are observed, as well as numerous species of invertebrates. Within Martin Sagrado reserve over 160 mammal species, 324 bird species, 26 butterfly species, 106 reptile species, 123 amphibian species exist, as well as many other species of invertebrates.

As mentioned earlier in the fauna inventory (section G.1.7.3) more than 700 species have been identified (amphibians, reptiles, birds and mammals) whose unique characteristics (endemism, continuous distribution and conservation status) makes them worthy of being viewed as objects of conservation for the entire Peruvian Yungas ecoregion. In the area of the concession El Breo, the theoretical spatial distribution of these species (fundamental niche) has been projected onto hexagons (10 ha approx.) which indicate the total number of species they contain. The map obtained shows the areas with the greatest concentration of species, and the maximum record of occurrence obtained for a polygon within the Peruvian Yungas is 52 species.

Map information based on that we have developed a distribution map of these sites for the requested area. There we can see that our proposal includes a high concentration of sites with high richness of species, including an hexagon with an occurrence of 51 species.

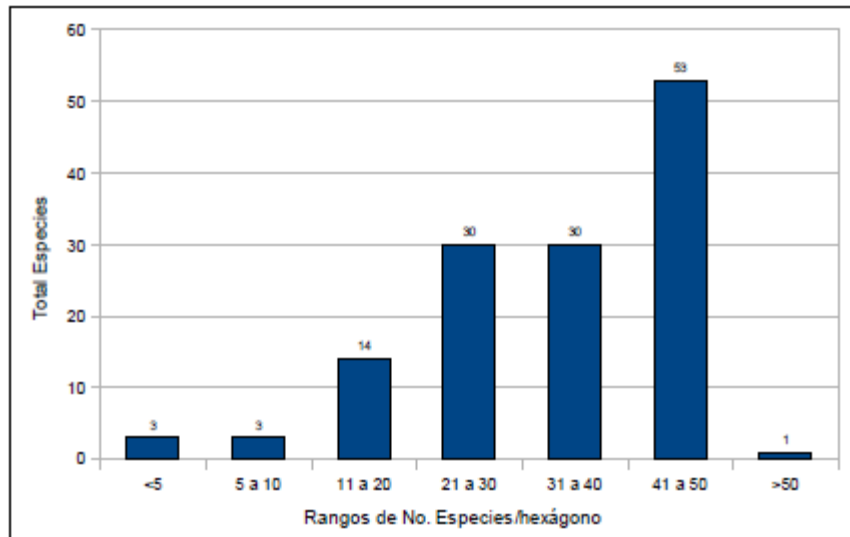
Figure 20 : Spatial distribution of species considered as objects of conservation



Elaborated by AMPA. Source: CDC-UNALM y TNC, 2006

Similarly, around this hexagon occurs exceptional concentration of sites with high species richness (> 40 species per hexagon) to the west side of the area. A distribution histogram of the number of species per polygon reveals a bias toward hexagons with high wealth. About 60% of these sites display more than 31 species unique to the Peruvian Yungas.

Figure 21 : Distribution of hexagons / Richness of species for the conservation of the Yungas



Elaborated by AMPA. Source: CDC-UNALM y TNC, 2006

G1.8.3. Threatened or rare ecosystems

G.1.8.3.a. Area with vulnerable soils

According to the Economic Ecological Zoning of St. Martin, the proposed project area is within the protection zones for soil and slope conditions, with a smaller area corresponding to an association of slope protection zones and soils associated with timber potential forest production fair to poor. Thus, we are facing very fragile areas unsuitable for agriculture. It is recommended to their protection from migration trends that lead to disordered occupation of the territory of the basin, it does not take into account the natural ability of soils.

This classification as protected areas comprises those lands that have no ecological or soil conditions required for the operation of crops, pasture or forest production and other lands that have natural vegetation forest but its use is not economical and should be handled with for watershed protection, wildlife, scenic values, recreational and other benefits involving collective or social interest.

G.1.8.3.b. Rare ecosystems with conservation objectives

The Data Center for Conservation - UNALM & TNC (2006), using biophysical models from different inputs and different methods, identifies and describes the terrestrial ecological systems (SET) of the Peruvian Yungas.

At coarse filter level (ecosystem level), within the Peruvian Yungas Ecoregion, the CDC-UNALM identified 18 SETs as conservation targets (CDC-UNALM and TNC, 2006). The SETs are defined as "groups of plant communities that tend to co-occur in the landscape due to its relationship with common factors and determinants and ecological processes, substrates and / or environmental gradients" (Josse et al., 2007:11). The use of SETs to evaluate the effectiveness of conservation has many advantages because it combines in one system: ecological, dominant vegetation and landforms. 09 types of SETs have been

identified as priority conservation targets for the project area, which are detailed in the General information G1.2 "The types and condition of vegetation within the project area".

These units synergistically complement those already included in the Abiseo River National Park and the Concession for Conservation "Alto Huayabamba," forming a more robust and resilient block to global climate changes to come.

G.1.8.3.c. Conservation targets

The Data Center for Conservation (DCC-UNALM) and The Nature Conservancy (TNC) has identified two major Peruvian Yungas blocks that are of high priority because they encompass a large number of species and key ecosystems and still maintain a high level of integrity (low human intervention, high connectivity). One of these blocks is the San Martín Yunga - that stretches from Huánuco northern Monsoon Valley to the headwaters of Alto Mayo (CDC-UNALM, 2003, DCC-UNALM and TNC, 2006).

The following conservation targets (species level) have been selected by the organizations mentioned above:

Mammals	1. Mono choro de cola amarilla - <i>Oreonax flavicauda</i> 2. Oso de Anteojos - <i>Tremarctos ornatus</i>
Birds	3. Gallito de las rocas - <i>Rupicola peruviana</i> 4. Loro mejillas doradas - <i>Leptosittaca branickii</i>
Quina o Cascarilla Tree	5. <i>Cinchona officinalis</i> y <i>Cinchona pubescens</i>

Also, based on information about range, habitat preference and distribution of forest types, we project that would be found within the area as well: the night monkey (*Aotus miconax*), the Andean stump monkey (*Callicebus oenanthe*) and three palm trees Andean (*Ceroxylon crispum*, and *Prestoea maynensis* *Wettinia acuminata*). All these elements have also been selected as conservation targets of the Yungas de San Martín and NorthEast Huanuco.

Mamíferos	6. Mono nocturno - <i>Aotus miconax</i> 7. Mono tocón andino - <i>Callicebus oenanthe</i>
Palmeras Andinas	8. <i>Ceroxylon crispum</i> , <i>Wettinia maynensis</i> y <i>Prestoea acuminata</i>

The identification of species conservation objectives was done by incorporating the criteria used by the DCC-UNALM , which are:

- a) Species known to society, especially local communities (cock of the rock, spectacled bear, the cinchona tree).
- b) Species of great scientific and endemic (endemic primates such as yellowtail woolly monkey, monkey Andean night monkey Andean stump, rare birds such as parrots and golden cheeks spectacled bear).
- c) Species of scientific and social importance (Andean palms).
- d) Endangered species (primates, spectacled bear, parrot golden cheeks)

Furthermore, the prioritization of species as conservation targets are made taking into account the sensitivity of these to changes in the environment (eg primates, spectacled bear, parrot golden cheeks).

The same shall take into account the availability of scientific information on the species (habitat requirements and conservation status). Below is the most outstanding characteristics (description) of the species listed as conservation targets in the project area, indicating its importance (CDC-UNALM & TNC, 2006).

Figure 22 : Description of species considered as conservation targets

Palmeras Andinas	
<i>Ceroxylon crispum</i> , <i>Wettinia maynensis</i> y <i>Prestoea acuminata</i>	
<p>Distribución: <i>Ceroxylon crispum</i> en Huánuco, endémico y San Martín; <i>Wettinia maynensis</i> en Huánuco, San Martín y Loreto; <i>Prestoea acuminata</i> en Cajamarca-San Martín y Huánuco-Junín.)</p>	
	
<p>(Fotos: Archivo de AMPA. C.Flores. 2008)</p>	
<p>Hábitat: <i>Ceroxylon crispum</i> en bosque natural montano, entre 2500 y 3000 msnm; <i>Wettinia maynensis</i> en bosque natural montano, entre 160 y 1700 msnm; <i>Prestoea acuminata</i> en bosque de neblina a 1650 – 2500 msnm.</p>	
<p>Rol Ecológico: Las palmeras andinas son fuente de alimento (frutos aceitosos, inflorescencias) para muchas especies de fauna silvestre de montaña.</p>	
<p>Amenazas: <i>Ceroxylon crispum</i> es usada como material de construcción regularmente comercializado en mercados de la región, por lo que actualmente se le considera vulnerable, además destrucción de bosques donde existe para abrir campos agrícolas y para pastizales.</p>	
Árbol de la Quina o Cascarilla	
<i>Cinchona officinalis</i> y <i>Cinchona pubescens</i>	
 <p style="font-size: small; text-align: center;">Archivo AMPA. K.Pinasco 2007</p>	<p>Aspectos generales: <i>Cinchona officinalis</i> es un árbol de 11 – 15 m de alto con fuste cilíndrico (diámetro 30 – 40 cm), ramificación simpodial y copa globosa irregular. <i>Cinchona pubescens</i> es un árbol de 8 – 12 m de alto con fuste cilíndrico irregular (diámetro 18 – 28 cm), ramificación simpodial y copa globosa.</p>
<p>Distribución: <i>Cinchona officinalis</i> es una especie de amplia distribución, encontrándose en ambas vertientes de la Cordillera de los Andes, en Colombia, Ecuador, Perú y Bolivia; en Perú se distribuye desde Amazonas hasta Puno.</p>	
<p><i>Cinchona pubescens</i> se distribuye desde Costa Rica hasta Bolivia; en Perú se distribuye desde Piura y Amazonas hasta Puno.</p>	
<p>Hábitat: <i>Cinchona officinalis</i> se encuentra tanto en bosques naturales como en áreas disturbadas, entre los 1000 y 3150 msnm. <i>Cinchona pubescens</i> también en bosques naturales y áreas disturbadas, entre 400 y 3250 msnm.</p>	
<p>Rol Ecológico: Desconocido, solo se tiene reportes que <i>Cinchona pubescens</i> puede comportarse como una agresiva especie invasiva en las áreas donde se introduce como exótica.</p>	
<p>Amenazas: Para ambas especies de cascarilla existe presión por parte de la población para ampliación de las áreas agrícolas y la extracción de los recursos del bosque.</p>	

Mono Choro Cola Amarilla

Oreonax flavicauda



University of Wisconsin

Aspectos Generales: Es uno de los primates de mayor peso en el Perú: 8 a 10 kilos. Longitud de cabeza y cuerpo: 51 – 53 cm. Cola: 56 – 61 cm. Se caracteriza por tener el escroto y base de la cola prensil con pelos de coloración rojo-amarillenta y el hocico color amarillo pálido marcadamente contrastado con la coloración oscura del resto de la cabeza y cuerpo. Reciente se ha propuesto restablecer el nombre científico original: *Oreonax flavicauda*.

Distribución: Endémico del Perú, se distribuye exclusivamente en los departamentos de San Martín y Amazonas.

Hábitat: Especie exclusiva de bosques húmedos montanos y premontanos con fisiografía muy accidentada; bosques de neblina, entre 500 y 2700 msnm.

Rol Ecológico: Herbívoro arborícola diurno. Se alimenta de frutos, flores, raíces y pseudobulbos de epifitas, líquenes y peciolas de hojas.

Amenazas: Caza de subsistencia en áreas cercanas a caseríos, pérdida de cobertura forestal para establecimiento de agricultura y ganadería de vacunos y captura de individuos jóvenes como mascotas. La Unión Mundial para la Naturaleza considera una población de menos de 250 individuos en su área de distribución natural.

Mono Tocón Andino

Callicebus oenanthe

Aspectos Generales: Pesa aproximadamente 1 kg. Longitud de cabeza y cuerpo: 29 - 36 cm, cola (no prensil): 33 – 48 cm. El cráneo y piel del holotipo (macho adulto), colectado por L. Rutter en 1924 se encuentra depositado en el British Museum of Natural History de Londres.

Distribución: Endémico del Perú (localidad tipo: Moyobamba, San Martín, Perú 840 msnm). Solo en el norte del departamento de San Martín.

Hábitat: Bosques de neblina. Rango altitudinal conocido: 750 – 950 msnm.

Rol ecológico: Arborícola diurno. Probablemente se alimenta de hojas y frutos, ya que es reconocido que varios representantes del género *Callicebus* se encuentran entre los primates folívoros más pequeños.

Amenazas: Raramente es cazado para subsistencia debido a su escaso peso corporal, pero está perdiendo hábitat debido al establecimiento de agricultura y vacunos.

Oso de Anteojos

Tremarctos ornatus

Aspectos Generales: Oso de tamaño mediano, el largo de la cabeza y cuerpo varían entre 1.20 y 2.20 m, el largo de la cola es 7 cm. Tiene un peso variable entre 90 y 175 kg, siendo los machos más grandes y pesados que las hembras. El oso de anteojos presenta el cuerpo entero de color negro o marrón oscuro, a excepción de los grandes círculos o semicírculos blanco-amarillentos alrededor de los ojos que generalmente tiene – de ahí el nombre común de la especie – cuyas líneas se pueden prolongar hacia el pecho (estas líneas o manchas claras son particulares para cada individuo).



ecoportal.net

Distribución: El oso de anteojos es el único representante de la familia Ursidae en América del Sur, se distribuye desde Yuracay – Cordillera de Mérida, en Venezuela, hasta la provincia de Porta en Bolivia, comprendiendo así Venezuela, Colombia, Ecuador, Perú y Bolivia,

encontrándose las mayores poblaciones en las laderas inaccesibles del este de la cordillera de los Andes en Ecuador y Perú.

Hábitat: En el Perú, ocupa una gran variedad de hábitat en las cordilleras Occidental, Central y Oriental de los Andes, encontrando a las mayores poblaciones en la cordillera Oriental: es decir, en las Yungas Peruanas. Los osos prefieren como hábitat los bosques húmedos entre los 1900 y los 2350 msnm y los bosques espinosos de la Costa cuando encuentran agua disponible; también, los pastizales altoandinos son utilizados en forma estacional. El oso de anteojos es típico de los bosques nublados y enanos de las Yungas Peruanas y se considera especie emblemática en campañas de conservación de los bosques nublados Andinos.

Rol Ecológico: Es de costumbres nocturnas y diurnas, terrestres y parcialmente arborícolas. A pesar de pertenecer al orden Carnívora, su dieta es principalmente vegetariana, una escasa proporción está relacionada con material animal, entre insectos y roedores principalmente, el resto lo conforman bayas, cortezas, corazones de bambú, peciolo de hojas de palmera, bromelias, cactus y frutos. Es considerada una especie muy importante para la diseminación del polen y dispersión de semillas de varias especies botánicas.

Amenazas: El oso es cazado para obtener sus patas y pelo para usos en medicina tradicional; por ejemplo, en el mercado de herbolarios de la ciudad de Chiclayo es frecuente encontrar puestos de venta donde se ofrecen esos productos provenientes de las montañas nubladas de San Martín, Amazonas y Cajamarca. Los osos también son eliminados por los campesinos cuando estos destruyen los cultivos; es frecuente, por ejemplo, el ingreso del oso a los campos de maíz. Por otro lado se considera que esta especie está perdiendo hábitat debido al establecimiento de agricultura y ganadería de vacunos en desmedro del bosque; esto último conlleva a la fragmentación y disminución de la productividad del hábitat y, posteriormente, al aislamiento paulatino de las poblaciones de oso.

Mono Nocturno Andino

Aotus miconax

Aspectos Generales: Mono nocturno del grupo "cuello rojo". Pesa aproximadamente 1 kg. Longitud de cabeza y cuerpo: 24 a 27 cm; cola (no prensil): 9 cm. El estatus taxonómico de esta especie es incierto, ya que solo se conocen especímenes antiguos, a pesar de ello actualmente se reconoce como una especie válida.

Distribución: Endémico del Perú. Departamentos de San Martín, Huánuco, Amazonas. Esta especie es solo conocida por pieles y cráneos colectados en el río Chinchao (departamento de Huánuco) en 1922 por E. Heller (depositados en el Field Museum of Natural History de Chicago) y por otros restos depositados en el Museo de Historia Natural de la Universidad Mayor de San Marcos (Lima) colectados en 1948 en el río Cayumba (departamento de Huánuco); sin embargo, coincidentemente, varios autores consideran su rango de distribución en términos muy similares a lo que son las Yungas del departamento de San Martín y el norte del departamento de Huánuco. El CDC-UNALM ha registrado en dos ocasiones (sin colección) *Aotus* sp. en los Andes Peruanos 1992 y 1997.

Hábitat: Bosques de neblina de la región centro-oriental del Perú, encima de los 800 msnm, compartiendo hábitat (simpatria) con *Lagothrix flavicauda* y *Callicebus oenanthe*, otros dos primates endémicos del país.

Rol Ecológico: Arborícola y nocturno. No se conoce mucha información sobre sus hábitos; sin embargo, se sabe que es principalmente frugívoro, aunque se alimenta también de insectos y néctar de flores.

Amenazas: Raramente es cazado para subsistencia debido a su escaso peso corporal; pero sí está perdiendo hábitat debido al establecimiento de agricultura y ganadería de vacunos; sufre también captura de individuos para mascotas.

Gallito de las Rocas

Rupicola peruviana



<http://www.tunqui.com>

Aspectos Generales: Tiene un tamaño aproximado de 30 cm. El macho y la hembra presentan cresta, la cual casi llega a cubrir el pico; el macho es de color rojizo anaranjado con alas y cola negra; la hembra es marrón rojiza. Es considerada el ave nacional del Perú.

Distribución: Se distribuye desde el noroeste de Venezuela hasta Bolivia. En el Perú se distribuye en la vertiente oriental de los andes.

Hábitat: Habita las selvas nubladas densas y húmedas (500 a 2400 msnm), cerca de ríos y riachuelos con acantilados rocosos y precipicios.

Rol ecológico: Se alimenta de frutas e insectos.

Amenazas: Esta ave está perdiendo hábitat natural debido al establecimiento de agricultura y ganadería de vacunos en desmedro del bosque; sin embargo, pareciera que es una especie que puede adaptarse a hábitats perturbados, habiéndose registrado en bordes de chacra o ecotonos bosque-chacra. El gallito de las rocas es eventualmente cazado para obtener especímenes disecados con fines ornamentales o para uso en medicina tradicional; por ejemplo, en el mercado de herbolarios de Chiclayo puede encontrarse puestos de venta donde se ofrecen animales disecados provenientes de las montañas nubladas de San Martín, Amazonas y Cajamarca

Loro Mejillas Doradas <i>Leptosittaca branickii</i>	
	<p>Aspectos Generales: Lorito o cotorra mediana (30 a 35 cm) y de cuerpo delgado, lo que lo asemeja a un guacamayo pequeño; es de color general verde, tiene una franja amarilla delgada desde el lores hasta los cobertores de oídos, abdomen naranja.</p> <p>Distribución: Regiones Andinas húmedas de Colombia, Ecuador y Perú. En Perú reportado desde Amazonas-San Martín hasta Junín-Cuzco. Su localidad tipo es Maraynioc, departamento de Junín 3240 msnm.</p> <p>Hábitat: Bosque de neblinas, ocasionalmente visita el páramo; altitudes entre 2400 y 3400 msnm, incluso de la línea de bosque (timberline, es decir el límite superior hasta donde llega el bosque), eventualmente llega a 1400 msnm.</p> <p>Rol Ecológico: Se alimenta de semilla y frutos (Moráceas, Podocarpaceas), por lo que debe ser un dispersor de semillas y polen.</p> <p>Amenazas: Esta ave es rara y sólo se ubica en localidades fragmentadas. Ha perdido hábitat natural debido sobre todo al establecimiento de agricultura y ganadería de vacunos; sin embargo, algunos autores sugieren que el incremento de áreas de cultivo (sobre todo de maíz) en su área de distribución natural podría favorecer a este lorito.</p>

G.1.8.3.d. Other rare and valuable species

The forest in the project area is very important in terms of biodiversity conservation since it is conformed by important populations of the specie *Swietenia macrophylla* (mahogany), and *Cedrela odorata* (cedar), which have been incorporated respectively to the Appendix II and III of CITES for being considered endangered and vulnerable species.

G1.8.4 Areas that provide critical ecosystem services

G.1.8.4.a. Regulation and water supply

The concession El Breo itself covers approximately 9% of the Huayabamba River subwatershed, including the middle and lower basins of the Breo and Cordoncillo rivers and complements the Conservation concession for Alto Huayabamba in the regulation of water sources that descend abruptly from the 4400-4600 meters to 600 meters in just 60 km horizontal projection. Thus, the role of forest cover is essential to prevent erosion and regulating base flow that would otherwise be discharged as a stream in a short period of the year. This is based on the hydrological study of the San Martin region by Maco, J. (2005), which indicates that during the dry season river flow exceeds Huayabamba Huallaga river at the point of intersection. In this sense we can say that water environmental services provided by the concession area for Conservation El Breo have a regional scope, directly benefiting the population living in the middle and lower sub Huayabamba river as well as indirectly to that established in the middle basin of the Huallaga River, which now represents the valley's most populous and largest development and production of the San Martin.

Protect and preserve vegetation and waterways in the area will allow the maintenance of water environmental services associated with it, thus contributing to the regulation of water flows as well as storage and water retention that makes it possible the efficient supply (in terms of quality and quantity) of

this vital resource in the watershed, reservoirs and aquifers, allowing fresh drain into the populations in its area of influence, both for human consumption for drinking and for use in agriculture, aquaculture, industry and transportation.

It is important to note that the contribution of CC water regulation contributes to a certain extent with the maintenance of the hydroelectric potential of the basins of Huayabamba and Huallaga Central, which is related to the strong flows and waterfalls that are normally therein, which may be exploited for the installation of small hydro power plants which supply power to the local populations, thus contributing to the use of renewable energy do not depend on fossil fuels, apart from being expensive, pollute the environment.

G.1.8.4.b. Erosion control and sediment retention

The project area soils are shallow and located in areas of steep slopes. This indicates that the associated vegetation is extremely fragile to changes of use. Deforestation can lead to irreversible processes of soil loss due to erosion by wind and rain would be faster than the soil formation processes. Therefore, the presence of vegetation in that area increases soil retention within the ecosystem, controlling the accumulation of sediment in lakes and wetlands downstream.

G.1.8.4.c. Carbon sequestration and regulation of the microclimate

At this point in the negotiations for the mechanism of the Kyoto Protocol is undoubtedly the role of deforestation in the contribution of greenhouse gases. Keep the primary forests of the lease has an undeniable advantage over other forms of land use due to high carbon stored. Thus, this project is an opportunity to add to inventory forests that Peru can offer as permanent stocks of forests (avoided deforestation).

In addition to the benefits of carbon sequestration, forest area contributes to the regulation of local and regional temperature because in this area are the building blocks of cold air, having high density, lower to medium and low areas of the basins, mixing with the hot air produced in these zones and thus regulating temperature. Also, this air flow contributes to the regulation of rainfall and other climatic processes biologically mediated locally and regionally.

G.1.8.4.d. Habitat for fish reproduction

The lower parts of the requested area is located on the river Huayabamba are recognized by local people and sites that contain a high concentration of hydro-biological resources, among them outstanding tarpon (*Brycon cephalus*) and boquichico (*Prochilodus nigricans*). The observations conducted by the evaluation team and the stories of the people to infer that the riparian forests in the lower area are temporary refuge habitats during the rainy season or spawning areas. There is a local consensus that commercial fishing in these areas should be prohibited, especially in the Martin Sagrado and El Breo waterfall sites . These are sites that are depending on subsistence fisheries and trade conducted along the lower reaches of Huayabamba.

G.1.8.4.e. Pollination and dispersal of species of commercial value

The CC El Breo is adjacent to the Zone 2 Permanent Production Forest (BPP) of San Martín (0549-2002 RM-AG). Healthy populations of pollinators and dispersers within the concession emerge as an important safeguard to maintain the processes of natural regeneration of commercial species within Zone 2 of the BPP. Thus, logging units located in southwestern sector have an important source of seeds and pollinators DC The Breo. Similarly, the CC would favor Breo commercial plantations carried out in the vicinity, including local production of cocoa, bananas and citrus. CC Forests Breo source would be acting as pollinators, dispersers and core or a barrier for biological pest control.

G1.8.5. Areas that are fundamental for meeting the basic needs of local communities (e.g., for essential food, fuel, fodder, medicines or building materials without readily available alternatives)

G.1.8.5.a. Food provisions gathered by hunting

The population located inside the zone and on the outskirts is benefiting from hunting wildlife migrating from the surrounding forests. . Large mammals and birds have almost disappeared from grocery nuclei populated in the lower basin of Huayabamba. However, in nearby towns, it is still possible to access game animals that ensure to maintain healthy populations and eventually migrate from the high forests of the requested area (source). Thus, the forest of the area requested has been contributing steadily to the local diet. This environmental service be maintained only if it maintains the integrity of the forest and implement measures to regulate the rational use of this fauna.

G.1.8.5.b. Unique landscapes with opportunities for recreation

The area also features ecotourism attractions as the Falls of El Breo, Velo de Novia and Chambirillo Falls, Cajaanahui canyon, among others; in addition to forests in good condition and riparian landscapes of crystal clear waters inhabited by fish tame that invite contemplation and appreciation of nature in its pristine form. Because of its location in a transition zone between the lowlands and Andean highlands, the area allows the expression of many types of landscapes that differ from the familiar Amazon floodplain. The landscapes in the area of the region have always intrigued locals and travelers, we believe that these attractive landscapes should be protected to be shared with future generations.

G1.8.6 Areas that are critical for the traditional cultural identity of communities (e.g., areas of cultural, ecological, economic or religious significance identified in collaboration with the communities).

The projet zone is an area of great archaeological wealth of pre-Hispanic ancestors. There is no research before our first archaeological field work (Schjellerup 1997). There are remains of the Chachapoyas culture (800-1470), in the form of rounded structures of stone and many funeral homes are built on the slopes of the rocks with red paint and architectural ornaments symbol. The symbols were significant ethnic and social value, the use of symbols offered a demonstration of potential for local identity, which was maintained through the Inca period.

East of the Cordillera Oriental are many Inca sites (1470-1532), such as buildings in drywall or along the banks of Huabayacu (Schjellerup 1997). An Inca trail comes from Bolívar and unites with another way Hornopampa, where the Inca trail follows the river Huabayacu, crossing a mountain range and Continual north to the province Rodríguez de Mendoza. Near La Morada are the remains of a fortress and rectangular structures (Rangrapata and Hornopampa) and a site with masonry style Inca Cuzco. The farms currently in the Morada and surrounding area is the remains of stone terraces, which is being destroyed by the settlers.

G2. Baseline Projections



G2.1. Most Likely Land-use Scenario in Absence of Project

G2.1.1. Context and history of deforestation

“One of the worst problems about global warming is that mankind in the last 500 years has destroyed 50 percent of forests on the planet and that is a very serious problem indeed,” Antonio Brack, Environment Minister of Peru, (Rhett A. Butler, mongabay.com, August 03, 2009).

“Up to now development has consisted of the woodland practice of slash and burn to clear land for crops and livestock, but that has given mediocre results because of the 10 million hectares where that has been done, 8 million hectares are unproductive. It’s shameful and we can’t keep doing it.” he said, adding that programs aims “to save these forests and at the same time see how we can give a basic income to these communities for the woodland they preserve.”

“Peru can contribute enormously to the world in preserving biodiversity, native cultures and forest management, and we’re laying down a big challenge to protect those forests, create wealth from them and not destroy them.” Antonio Brack, Environment Minister of Peru, August 03, 2009

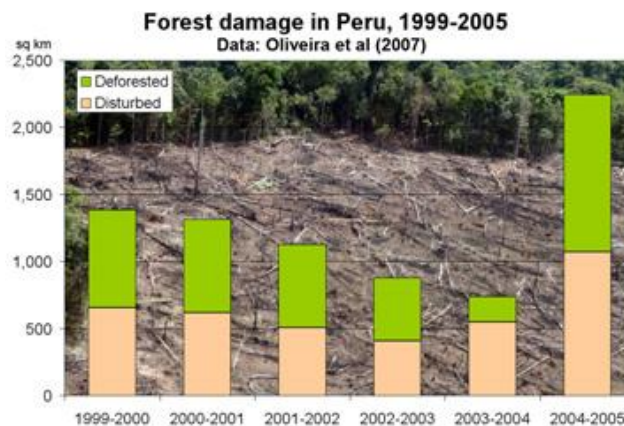
Peru has historically had one of the lowest annual deforestation rates in the Amazon basin, but forest loss has been increasing in recent years due to illegal logging, mining, agriculture, and expansion of road networks, including the paving of motorways that provides access to a remote and biologically-rich regions.

In 2005 — the most recent year for which data is available — at least 150,000 hectares of forest was lost, while a similar area was degraded through logging and other activities.

Conflict between developers and native communities has been escalating over the past year. In June 2010 more than 30 were killed in a clash between indigenous protesters and federal police over the government's plan to promote energy development in the Amazon rainforest. More than 70 percent of the Peruvian Amazon is now under foreign concession. Deforestation and land use change accounts for roughly 70 percent of Peru's greenhouse gas emissions, according to the Carbon Dioxide Information Analysis Center (CDIAC). Spanning a variety of ecosystems, including the dry coastal region, the tropical Amazon, and the high Andes, the country is particularly vulnerable to climate change.

The Peruvian government estimates that the country's glaciers have shrunk by more than 20% in the past 30 years and expects them all to disappear by 2040. The loss of glaciers, which are the source for as much as 50 percent of the water in the upper Amazon, could have a significant impact on agriculture and urban water supplies as well as the Amazon rainforest. Indigenous communities are believed to be especially at risk from climate shifts. (Source: Rhett A. Butler, mongabay.com, August 03, 2009).

Figure 23 : Forest Damage in Peru, 1999-2005



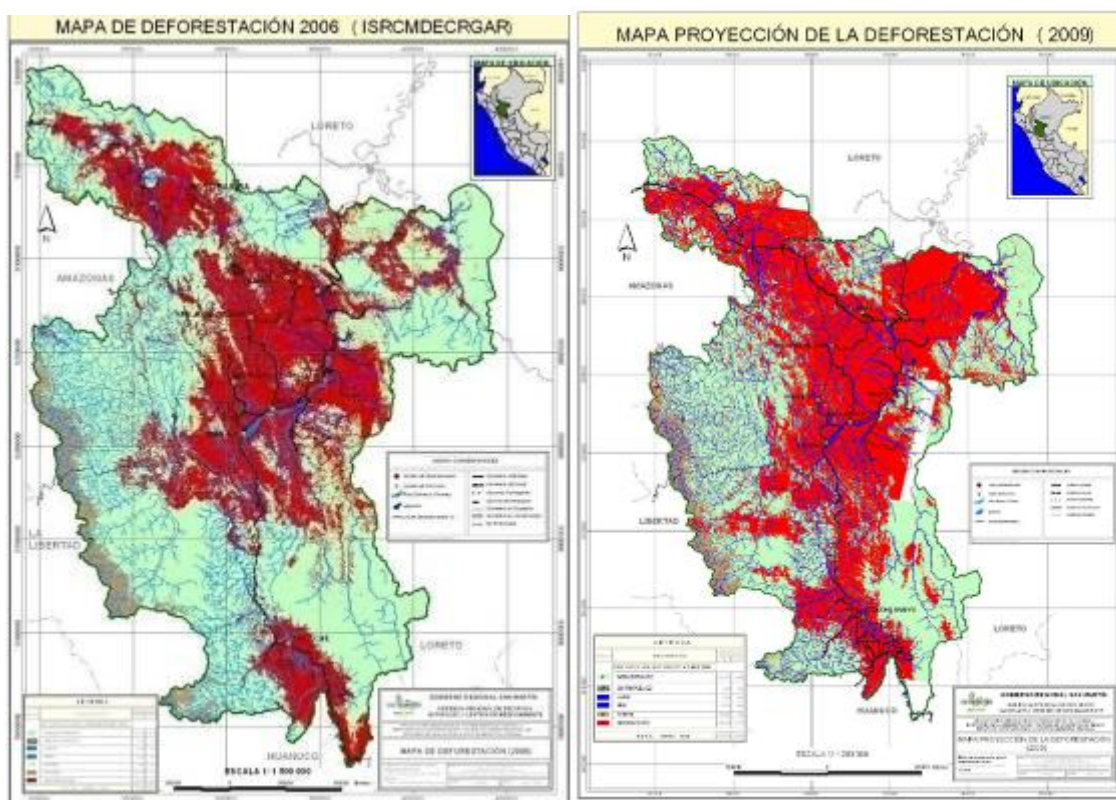
Historical deforestation activities of San Martin

- From 1940 to 1960, the San Martin region was mostly covered with forests and with a deforestation rate of less than 8000 ha / year (Source: APECO, 1995).
- From 1960 to 1975, the deforested area went from 296 019 ha to 1 046 675 ha, equivalent to 50 057 ha / year, a multiplication by 6 of the annual deforestation rate. This was linked with the main motorway constructions of the region.
- From 1975 to 1979, same deforestation rate continues with 171 000 ha deforested.
- From 1980 to 1983, the region loses again 168 000 ha of forests, reaching a total of 1 386 214 ha.
- From 1983 to 1989, the total yearly deforested area accounts for 15 000 ha / year. This period sees very large increase of the coca production in the region, leading to massive pollution of soils and rivers due to heavy use of agro-chemicals and kerosene for cocaine production.
- Until 1993, the deforestation rate slightly decreases, to reach again levels of 50 000 ha / year of deforestation since that date.
- In 2002, deforestation area in San Martin accounts for 1 423 743 ha. The average yearly deforestation area is at 50 000 ha / year. (Source : INRENA).

According to the Regional Government of San Martín, about 26% of the Region San Martín was deforested in 2004³, and the annual deforestation rate was about 1.17%, which represents 57221 hectares per year (Source : IIAP 2004).

Latest non public figures (preliminary results) from the San Martín regional roundtable on REDD “Mesa REDD San Martín” indicate that deforestation rate could have been reduced in the last years from 2006 to 2010, lowering to an average annual rate of 0.50%.

FIGURE 24: Deforestation map in San Martín Region (2006; and 2006 projection for 2009)



Source: Regional Government of San Martín
(Red area is deforested area)

In absence of the project, it is likely that deforestation in the province will continue, and **a conservative annual rate of deforestation of 0.50% can be used for baseline projections** (This rate will be refined upon completion of the baseline scenario of the Mesa REDD San Martín in 2012)

³ F. REATEGUI REATEGUI, P. MARTINEZ DAVILA. Gobierno Regional de la Region San Martín. “Zonificación Ecológica Económica de la Region San Martín.” Informe Temático Forestal. Dec 2004.

G.2.1.2. Drivers and agents of deforestation

Project assessments, interviews and participatory rural appraisals indicate that at least nine drivers of deforestation and six agents of deforestation have been and continue to be active in the San Martin Province.

Note that the identified active drivers of deforestation are not, by any means, an exhaustive or complete representation of the deforestation threat in Peru or even within the San Martin Province. These drivers represent the most prevalent drivers that have been active in the past and will continue to be active in the future.

TABLE 8 : Drivers and agents of deforestation

Drivers - deforestation and degradation practices / Land-Use	Agents of deforestation						Total
	Local communities	Migrants	Mine/Oil dealers	Illegal dealers	Loggers	Government	
1. Conversion to croplands, pastures and housing	17%	28%		25%			70%
2. Conversion to settlements / infrastructure (Roads, water and electricity)	5%	7%				3%	15%
3. Selective logging of high-value species for commercial sales	1%	1%			8%		10%
4. Timber harvesting for local use (housing and infrastructures)	0,5%	0,5%					1%
5. Fuelwood gathering	0,5%	0,5%					1%
6. Uncontrolled fires	1%	1%					2%
7. Intentional fires (Paths opening and fires for hunting)	0,5%	0,5%					1%
8. Mining and Hydrocarbon activities encroachment			0%			0%	0%
9. Economic land concession (timber and agriculture)						0%	0%
Total	25,5%	38,5%	0,0%	25,0%	8,0%	3,0%	100%

1. Forest clearing for conversion to croplands and pastures

The population of San Martin is estimated at 669 973 people (San martin Region, 2005), which represents 2.6 % of Peru and 20 % of the population living in the Amazon rainforest in Peru. Majority of population is urban (65.3 %). Density is at 13.07 people / km² but if considering only potential productive lands, it is at 60 people / km².

Forest clearing for land sales and conversion to croplands is mainly driven by local population, migrants, and illegal dealers.

Migrants

San Martin is characterized by many waves of migrants coming into the region (for crops and coca production) since 1940. It went from 7.7 % of migrants installed in that year, up to 31.7 % of total population (175 363 people) in 1993 (Source: GORESAM and IIAP: Instituto de Investigaciones de la Amazonia Peruana, 2005). This has led to an increasing pressure on deforestation for agricultural activities.

While migrants may participate in forest clearing for future land sales, land speculation is often driven by business-people, officials, and local villagers who seek to claim and clear forest land for sale in San Martin. According to reports, “power men” hire migrants or local villagers to fell and burn off forest cover for \$50 to \$100 per hectare. Small huts are constructed to indicate residence, although these are frequently not occupied. This pattern reflects attempts to grab available public forest land and hold it until it can be resold at a higher price. While these actions are usually illegal, letters from local officials are used to create an appearance of legitimacy. Once one plot is opened it appears to encourage other migrants to open forests in neighboring areas. In some cases, poor migrants may sit on the plot for one to two years waiting for land values to rise. These plots are then sold to a “consolidator” or businessman who buys a number of them to form a larger plot.

The province has no budget to protect, rehabilitate or develop these lands and so they often are either leased as large Economic Land Concession or reclaimed by migrants.

Local population

The rural population average increase rate is at 5 % for San Martin. (Source: GORESAM and IIAP, Instituto de Investigaciones de la Amazonia Peruana, 2005).

With the rural population expanding at a rate of 5 % per year (33 498 more people each year), demand for farmland will require an additional 67 000 to 160 000 hectares annually based on 2 to 5 hectares for each household. In addition, the Provincial Governor has proposed the development of new settlements for migrants. Aside from migrant pressures on forest clearing, local communities are experiencing overpopulation and also require an increasing amount of farmland as children marry and establish independent farms. In the past, village elders were responsible for identifying forest areas that are suitable for rain fed corn and paddy fields. Young families or migrants requiring land approach the elders to request a farmland allocation. Usually a 2 to 5 hectares plot with good soil moisture is selected within the forest. Many committees are accepting these plots on the basis that the “owner” agrees not to expand the existing fields.

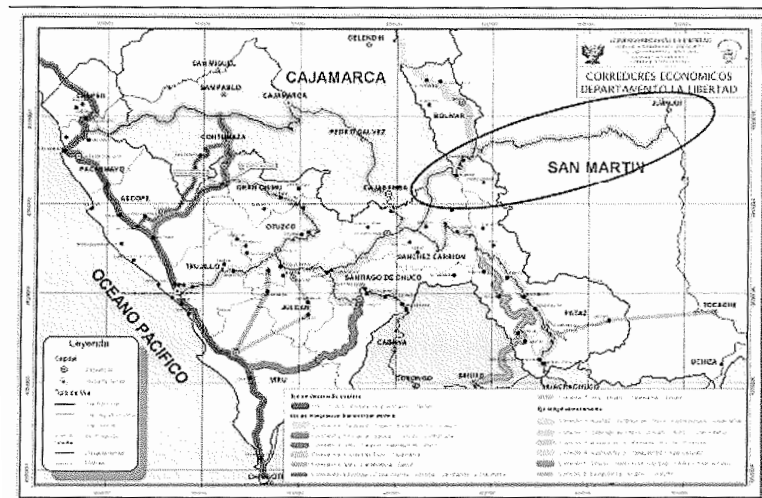
Causes leading to deforestation

Population density increase (demography + immigration), Good revenues from agriculture, development of cocoa industry in San Martin Region, Soil fertility, Historical use of cattle as patrimony.

Improved accessibility through the opening of roads, paths is a major cause leading to migration and increased deforestation.

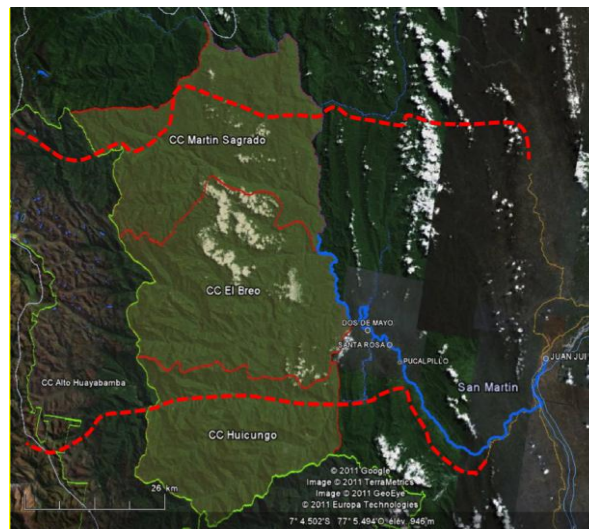
Road construction is one of the most important underlying threat for the area sustainability, as road construction will damage the forest and open the zone to easier illegal invasions. Past road projects show how damaging such constructions may be. In particular, the road project “Salaverry – JuanJui” connecting La Libertad to San Martin region, would cross straight through the project area, along Jelache River. Another road project Chuquibamba - La Morada – Saposoa connecting Amazonas region (Chuquibamba) to San Martin region across the mountains would also cross straight through the project area

Figure 25 : Salaverry – Juanjui road plan



Source: Plan vial departamental participativo La libertad, 2004-expediente tecnico CC el Breo

Figure 26 : Map of the potential road projects crossing project area



Source: Plan vial departamental participativos La libertad y Amazonas

Underlying Causes

Lack of economic activities in the mountains, population pressure, lack of clear land property and titles, country infrastructure development.

We consider this major **driver at 70 % of potential contribution to deforestation**.

2. Conversion to settlements / infrastructure (Roads, water, electricity, buildings)

Throughout the project zone settlements have been expanding rapidly over the past decade (at a comparable rate as population increase at 5 % per year). Settlement growth occurs through the expansion of village boundaries as forests are cleared for roads, houses, shops, and other buildings in the region. In addition, newly created communities are also established by migrants or local families interested in creating new villages. New villages are approved by local government officials but some install their homes without legal authorization (ex: Puerto Mojaras Case, Acopagro visit, 2010 and Alto Shamboyaco Case, 2010). The area likely reflects population growth trends in general.

This driver is assessed at **15% in terms of contribution to deforestation** in San Martin, though this may be further accelerated by private and public sector investment.

Causes

Demographic growth implies the need for new and more infrastructures (schools, roads, electricity, football fields, cocoa modules, etc.)

Underlying causes

Population pressure on environment, lack of clear land tenure, development of the country's infrastructures, lack of education on environmental stakes, a lack of financial means and/or alternatives.

3. Selective logging of high-value species for commercial sales

The Timber sector in the San Martin region accounts for 8 % of the Peruvian national official production of wood. There are officially 216 Timber companies and an estimated 350 additional ones not legally formalized. There is very little data about actual wood production and a large part may be exploited without legal record, being illegal logging for most of it.

Local communities and migrants are as well, at a smaller scale, agent of this forest degradation within the reference project zone and outside.

Illegal logging contributes significantly to forest degradation but is particularly hard to monitor in terms of area. High-value "luxury wood" is selectively felled. Illegal timber smuggling is widespread, often organized by private sector operators who obtain support from local military and police. Armed soldiers are often involved in these activities presenting control problems for weaker Community Forestry Management Committees. Illegal loggers also benefit from the lack of transparency and information on land title and land tenure rights.

There are zones designated as Forests of Permanent Production (FPP, BPP in Spanish: Bosques de Produccion Permanente) in the San Martin Region for a total of 1 501 291 ha (RM N° 0549 – 2002 – AG, 2002). Of which 576 192 ha are in areas of protection, 750 336 ha in areas of protection associated with timber production and 237 614 ha in areas of recuperation. Of these FPPs, divided in 120 parcels, 75 have been already contracted as forest concessions by 28 forestry companies for a total of 472 184 ha. (Source: CIF 2006 & Mediante RM N°0549-2002-2002). Logging concessions are situated on the left bank

of rio Huayabamba (East). There are possibilities of encroachments, on-site wood cutting, close to the rivers (difficult extraction, lack of accessibility and material) and the river can be crossed easily.

Hence, there is an additional risk of deforestation leading to partial or total deforestation, giving the very limited control capacity from local authorities on that aspect. Some additional timber concessions could be distributed in the future and the areas extended, hence we consider the **driver at 10 % of potential contribution to deforestation**.

Underlying causes

There is no economic alternative to date more profitable than timber sales of high value species.

4. Timber harvesting for local use (housing and infrastructures)

Housing in rural settlements is classified as semi-permanent (roofs and walls constructed of temporary materials like bamboo, thatch, grass, reeds, etc.) and permanent (constructed with more durable materials like wood, concrete, etc.). Permanent housing requires the felling of straight timbers to construct residences, businesses, and shops. Semi-permanent housing also requires the harvesting of timber, and their temporary nature often means they are abandoned and their inhabitants move on to other areas, increasing degradation on forestlands and requiring the use of additional forest resources.

Causes:

The demographic growth due to natural population increase and immigration leads to timber harvesting by local stakeholders, conducted to accumulate building materials for construction of lodging and basic infrastructure in settlements. Considering the limited number of families in the area and their very large forests, this driver is marginal, but could increase with the years if population increases and if neighboring communities or additional migrants settle in the area.

Due to the very low density of population within the project area, **timber harvesting for local use is estimated at 1 % of total deforestation drivers**.

Underlying causes:

Population pressure and high prices of other construction materials.

5. Fuelwood gathering

Communities participating in the project are mostly dependent upon fuel-wood for their energy needs (although some of them are testing solar or hydroelectrical energy), most of them being too isolated to bring any source of external energy.

The growth of urban centers (e.g. Tarapoto, Juanjui...) and small industry, where charcoal is the fuel source of choice, are stimulating expansion of the charcoal industry. Without the introduction of fuel-efficient stoves as recommended in the project, it is likely that fuel-wood consumption would continue to rise, rather than stabilize.

According to CIEF, fuelwood consumption in the Region of San Martin is evaluated at 1.3 m³ / person / year for people living in rural areas of the San Martin Region (234 000 people in 2007), accounting for 304 200 m³ / year.

A typical household might consume between 1 to 2 MT of fuel wood annually, reflecting a 55 to 110 MT of fuel-wood used in the project area each year, which is quite marginal, but still has to be followed up, since it can gain critical level with population increase of the community or of neighboring communities gathering fuelwood from the Martin Sagrado territory.

Underlying causes:

Demographic pressure, and lack of efficient alternative to fuelwood for cooking

This is a driver with a contribution assessed at less than 1 % to deforestation on the project area.

6. Uncontrolled fires due to slash and burn practices

Spontaneous fires in the region have been observed following spread of slash and burn practices, which are carried out when planting a parcel, or after replanting, after a period of 3 to 5 years of cultivation, followed by a period during which the farmer will not use the parcel anymore, for 5 to 10 or up to 20 years. These slash and burn practices are performed by farmers which are not members of ACOPAGRO (this practice is not accepted for organic certification and not practiced by Acopagro members).

Spread of fires from neighboring parcels to the project area is very limited since slashed and burned parcels are usually closely monitored by the farmers, and fires cannot easily migrate from a slashed parcel to a forest area because of humidity of forested areas. It can happen however on a fairly rare basis during dry summers. Children and careless smokers may also start these fires.

This is a driver with a contribution estimated to be of 2%.

7. Intentional fires (Paths opening and fires for hunting)

Forest fires are frequent occurrences in many areas and there are few resources available for local communities or government agencies to control the damage to woodlands or the resulting carbon emissions. In the absence of project, it is likely that ground fires will continue to degrade forests and suppress natural regeneration. The frequency of fires is increasing regularly and they often grow beyond their intended size and spread to other forest lands leading to significant degradation of forests and deforestation. As a result, biomass is lost and regrowth is slowed, at the same time fuel wood and timber is extracted leading to a gradual erosion of vegetative material and forest health.

Causes:

Concerning hunters, forest fires are occasionally started to flush out wild game (wild pigs, turtles, monitor lizards etc.) from heavily forested areas and concentrate the game into smaller parcels, where they are easier to catch. The burning of bunches of leaves and small branches is also practiced with the purpose of producing smoke to drive bees away from their hives to facilitate the collection of honey. Occasionally, this practice is the source of forest fire.

Moreover, in the mountain communities, a local belief according to which provoking fires would lead to increased rainfalls may encourage this practice, although it is very limited.

Underlying causes:

Game animals are typically hunted for subsistence. Increased urbanization, and demand for exotic meat may increase pressures on hunting lands and stimulate the use of hunter-induced forest fires to concentrate animal populations. The project will allow for the protection of forest lands from hunting fires by "social fencing", patrolling, and fire-prevention activities. Within the project area, hunters induced forest fires is considered very limited and is not used by the local community, this is more a practice outside of

the project area. However it is important to consider it as a danger to the forest as it would be hard to prevent a fire to spread to the project area. Migrants may also induce this practice where they settle.

Due to the very low density of population, annual forest fires are estimated at 1 % of total deforestation drivers within the project area.

8. Mining and Hydrocarbon activities

The attribution of oil and mining concessions has been suspended in 2011 in the San Martin Region, following the establishment of a regional law forbidding the expansion of oil and mining activities in the region. Considering this law, oil and mining concessions cannot be considered as a future active deforestation driver for the project area.

However, it is important to keep this threat included in the analisis, bearing in mind the high potential risks it would generate in case the public policy on that matter was to change in the future.

In fact, mining potential has already been identified in the project zone, with 10 mining concession that had already been solicited by the mining companies to the regional government.

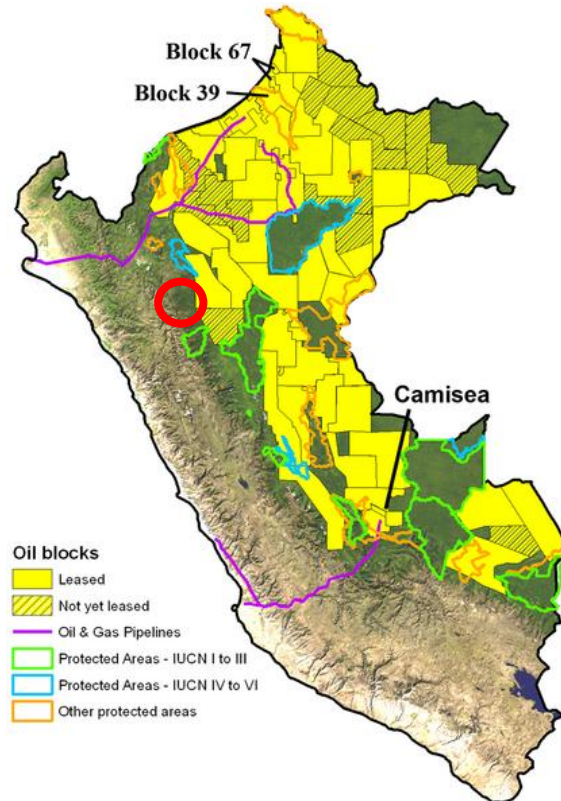
TABLE 9 : Information on the mine sites identified and concessions solicited to the government in the Martin Sagrado project zone

Nombre Petitorio	Ha	Clasificación	Titular	Fecha de presentación	Fecha Doc INRENA	Publicación
VM222	1000,000	Metálica	VOTORANTIM METAIS CAJAMARQUILLA S.A.	07/08/2008	18/11/2008	06/12/2008
VM267	1000.00	Metálica	VOTORANTIM METAIS CAJAMARQUILLA S.A.	27/08/2008	18/11/2008	06/12/2008
VM224	1000.00	Metálica	VOTORANTIM METAIS CAJAMARQUILLA S.A.	07/08/2008	27/11/2008	20/12/2008
VM220	1000.00	Metálica	VOTORANTIM METAIS CAJAMARQUILLA S.A.	07/08/2008	27/11/2008	20/12/2008
VM225	1000.00	Metálica	VOTORANTIM METAIS CAJAMARQUILLA S.A.	07/08/2008	27/11/2008	20/12/2008
VM237	1000.00	Metálica	VOTORANTIM METAIS CAJAMARQUILLA S.A.	07/08/2008	30/12/2008	04/01/2009
VM239	400.00	Metálica	VOTORANTIM METAIS CAJAMARQUILLA S.A.	07/08/2008	22/12/2008	04/01/2009
VM223	1000.00	Metálica	VOTORANTIM METAIS CAJAMARQUILLA S.A.	07/08/2008	30/12/2008	04/01/2009
VM221	1000.00	Metálica	VOTORANTIM METAIS CAJAMARQUILLA S.A.	07/08/2008	30/12/2008	04/01/2009
VM219	1000.00	Metálica	VOTORANTIM METAIS CAJAMARQUILLA S.A.	07/08/2008	17/12/2008	04/01/2009

Mining activities would not only imply encroachment in the project area but would also contribute to strong pollution of the tributaries of the Huayabamba river, therefore impacting all depending communities downstream.

Hydrocarbon potential in the project zone is also strong:

Figure 27 : Map of the leased block for hydrocarbon exploration and *exploitation*



The above map shows the current and potential future status of land lease to oil companies in Peru.

One can see that the project area is directly threatened by oil exploration since the land next to the project zone has been already leased for this activity. A Decree of January 15th 2000 (Mediante Decreto Supremo 002-2000-EM) was signed with the Perupetro and Advantage Resources, Selva LLC (Burlington) for the exploration of the Lot n° 87.

Martin Sagrado project area is located in the lot n°153, and although not leased yet, there is a risk in case of change of public policy that future participatory or authority decisions will allow against this activity to develop.

Hence, the risk is high, both for deforestation but as well pollution of the rivers of the area, the Huayabamba River, among others.

Causes:

In case of oil exploitation, we can envision a driver of 33 % for deforestation and degradation potential of the area, with the complimentary development of such activities (blasts for additional seismic studies road and settlement constructions, additional migration of population, etc...). Former cases have proven heavy direct and indirect impacts on the environment after installing such activities. The very rapid expansion of

oil concessions: multiplied by 6 since 2003, up to 41 % of forest area in Peru in 2009 and bound to reach 70 % of forest areas in Peru, justifies this Driver as being the main one.

Underlying causes :

Large economical stakes for the Peruvian government, on a national and international scale. In that sector, lobbying is extremely strong, as well as direct or indirect international pressures, which could lead to a change in the government's policy.

Given the current position of the government on the attribution of new oil and mining concessions in the San Martin province, this driver is considered to have a nil impact on baseline deforestation. However, this is a threat that needs to be monitored and included again in case of policy changes.

9. Economic Land Concession (timber and agriculture)

Over 769 079 ha (14.90 % of the Area) have been designated as production areas by the San martin government (Source: ZEE, Gobierno Regional San Martin / IIAP, 2005). These concessions are currently being cleared of forest for rice, papaya, corn and other commercial crops cultivation.

Similarly as for oil and mining concessions, position of regional government is not to attribute new ELCs in the Huayabamba river basin, considered by the regional government as an area for protection. However, lobby and strong underlying drivers may render ELCs again more attractive in the future and this threat should be kept in the analysis.

Underlying causes:

It is important to understand the economic and political dynamics driving the issuance of concessions. Some government planners maintain that underutilized lands need to be developed to generate revenues for the state however critics argue that past timber and other leases have produced minimal income for the country. Large ELCs are being criticized, for a failure to follow through on their commitment to implement management plans. There is some speculation that some business interests seek ELCs simply to harvest high value luxury wood, with no intention or financial capacity to invest in the development of their land.

Considering the current position of the government on the attribution of ELCs, this driver is considered to have a nil impact on baseline deforestation. However, this is a threat that needs to be monitored and included again in case of policy changes.

Hereafter is the summary of all drivers, agents, and underlying causes, with the individual contributions to deforestation

TABLE 10 : Summary of drivers of deforestation and relative significance

Drivers - deforestation and degradation practices/ Land-Use	Agents of deforestation						causes - Drivers of deforestation		Underlying causes of deforestation	
	Local communities	Migrants	Mine/Oil dealers	Illegal dealers	Loggers	Government	Total	Non spatial		Spatial
1. Conversion to croplands, pastures and housing	17%	28%		25%			70%	- Population density increase (demography + immigration) - Good revenues from agriculture: development of cocoa industry in San Martin Region - Soil fertility - Historical use of cattle as patrimony	- Further exploitation of rivers upstream - Projects of roads construction (South) (see details)	- Lack of economic activities in the mountains - Population pressure - Lack of clear land property / titles - Country infrastructure development
2. Conversion to settlements / infrastructure (Roads, water and electricity)	5%	7%				3%	15%	- Population density increase (demography + immigration) - Cocoa farming / drying facilities - Schools - Football fields - "Hostels"	- Development of economic activities in the vicinity (mining, oil exploration) - Further exploitation of rivers upstream - Projects of roads construction (South) (see details)	- Lack of economic activities in the mountains - Population pressure - Lack of clear land property / titles - Country infrastructure development
3. Selective logging of high-value species for commercial sales	1%	1%			8%		10%	- Some species with high value (timber/ medicinal) : e.g. tonillles, caoba - Population density increase (demography + immigration) - Wood used for construction, fencing - Wood used for cooking	- Logging concessions on left bank of rio Huayabamba (east). Possible encroachments/ crossing of river is easy - On-site wood cutting, close to rivers (difficult extraction, lack of accessibility and material)	- No economic alternative to date more profitable than timber sales
4. Timber harvesting for local use (housing and infrastructures)	0.5%	0.5%					1%	- Population density increase (demography + immigration) - Wood used for construction, fencing		- Population pressure - Other construction materials too expensive
5. Fuelwood gathering	0.5%	0.5%					1%	- Population density increase (demography + immigration) - Wood used for cooking		- Population pressure - No alternative for cooking
6. Uncontrolled fires	1%	1%					2%	- Forest clearing (Slash and burns practices) - Population density increase (demography + immigration) - Hunting practice - Provoque rainfall (local belief)		- Population pressure - Cultural habits and belief
7. Intentional fires (Paths opening and fires for hunting)	0.5%	0.5%					1%	- Population density increase (demography + immigration) - Hunting practice - Provoque rainfall (local belief)		- Large economic stakes for Peru - No immediate risks due to law forbidding oil and mining activities in the region
8. Mining and Hydrocarbon activities encroachment			0%				0%	POTENTIAL RISKS - Mining potential identified / Metal and Oil rich soil		- Large economic stakes for Peru - No immediate risks due to law forbidding oil and mining activities in the region
9. Economic land concession (timber and agriculture)							0%			- Large economic stakes for Peru - No immediate risks due to government position on ELCS
Total	25.5%	38.5%	0.0%	25.0%	8.0%	3.0%	100%			

Without project intervention it is likely that forests throughout the province, including those targeted for inclusion in the proposed project, will lose forest cover at a rate of at least 0,50 % per year. Without a REDD project in place, it is unlikely that the Martin Sagrado Project will have the financial, technical, or political support required to ensure the conservation of the area targeted for the project. The following table summarizes indicators that will be used to monitor the threat of each of the drivers of deforestation during the project's crediting period.

TABLE 11: Drivers of deforestation and Risk indicators

Drivers - deforestation and degradation practices / Land-Use	Indicators
1. Conversion to croplands, pastures and housing	Areas are deforested to establish a claim on land that is later sold, or resold as land prices increase. Growing pressure on forest land for agricultural expansion
2. Conversion to settlements / infrastructure (Roads, water and electricity)	Increase in magrand forest clearing along the roads and existing cities, and causes social conflicts
3. Selective logging of high-value species for commercial sales	Further forest degradation, removing larger, high value hard woods, while undermining community control.
4. Timber harvesting for local use (housing and infrastructures)	Reduced quantity of phenotypically superior and large trees
5. Fuelwood gathering	Growth of community-base commercial fuel-wood collection; existence or growth of charcoal industry
6. Uncontrolled fires	Suppressed natural regeneration of degraded forests. Cabon emissions from forest destruction
7. Intentional fires (Paths opening and fires for hunting)	Suppressed natural regeneration of degraded forests. Cabon emissions from forest destruction
8. Mining and Hydrocarbon activities encroachment	Forest clearing
9. Economic land concession (timber and agriculture)	Reduced forest resources. This creates presure on neighboring forests, and causes social conflicts

G2.2. Documentation that project benefits would not happen in absence of project

The key barrier to implementation of the project is financial. Project activities would not be possible without revenues from the sale of carbon credits. Farmers have have a maximum total net disposable income of a maximum of 4 000 Euros / year per family (for ACOPAGRO members) to cover basic needs but with this small amount, they surely cannot fund the project activities. Without carbon revenues, areas protected by the project would be subject to deforestation and degradation. Funds will enable to provide

training, workshops, technological assets and funding to support the ongoing monitoring of carbon stocks to ensure project activities are continued for the planned duration of the project.

There are no laws in place in Peru that require the project area to be protected. The project has contributed significantly to community awareness and ability to protect their lands. The project will also facilitate the development of government capacity to support and implement carbon projects, which prior to project intervention did not exist. In addition, the project has clarified land tenure and demarcated boundaries with signs between various community land-holdings. Both are key requirements in the development of carbon projects and distribution of carbon-related benefits.

G2.3. Calculation of estimated carbon stock changes in absence of project

G.2.3.1. Historical rates of deforestation

Tables 15 and 16 show the progressive deforestation from 2000 to 2006 within the reference region. These are the most accurate data we have for the province of San Martin.

Table 12 : Deforestation figures in San Martin Region in 2000

DEFORESTACION POR PROVINCIAS EN LA REGION
SAN MARTIN AL AÑO 2000

PROVINCIAS	AREA (Has)		% Deforestación
	Area Total	Deforestada	
San Martin	572,848	153,855	26.86
Lamas	495,483	196,281	39.61
Picota	214,352	121,558	56.71
Moyobamba	399,379	137,432	34.41
Rioja	265,161	93,354	35.21
Mariscal Caceres	958,797	130,200	13.58
Huallaga	730,780	87,386	11.96
El Dorado	131,643	91,850	69.77
Bellavista	786,059	114,307	14.54
Tocache	609,993	216,322	35.46
TOTAL	5,164,496	1,342,547	

Fuente: ZEE-San Martin - GORESAM

TABLE 13 : Deforestation figures in San Martin Region in 2006

CUADRO DE DEFORESTACIÓN PROVINCIAL DEPARTAMENTO DE SAN MARTIN				
PROVINCIA	SUPERFICIE TOTAL	SUPERFICIE DEFORESTADA (HAS:)	% DEFORESTACIÓN	UBICACIÓN DE PROVINCIAS CON MAYOR DEFORESTACIÓN
EL DORADO	130 589,00	120 377,00	92,18	1º
PICOTA	206 092,00	174 334,00	84,59	2º
RIOJA	265 161,00	115 875,00	43,70	3º
MOYOBAMBA	400 976,00	172 975,00	43,14	4º
LAMAS	494 799,00	200 797,00	40,58	5º
BELLAVISTA	821 538,00	259 688,00	31,61	6º
MARISCAL CACERES	932 952,00	270 561,00	29,00	7º
TOCACHE	625 104,00	157 854,00	25,25	8º
SAN MARTIN	579 444,00	132 309,00	22,83	9º
HUALLAGA	722 495,00	140 020,00	19,38	10º
TOTAL DPTO.	5 179 150,00	1 744 790,00	33,69	

Fuente: GRSM Proyecto GRRNNGMA -Implementación de Sistema Remoto de Control y Monitoreo de la Deforestación y Estado de Conservación para la Gestión Ambiental Regional", Junio 2008.

Over these 6 years, the deforestation rate was 67 040 ha / year average equivalent to 1.29 % / year of deforestation over the whole Province of San Martin.

G.2.3.2. Baseline deforestation rate

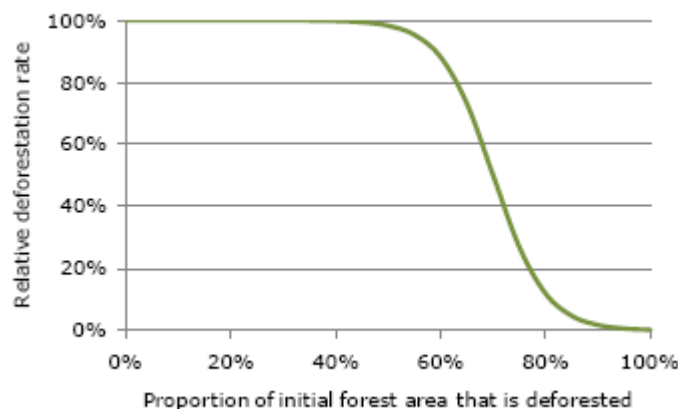
Although it would be reasonable to extrapolate the baseline deforestation rates in the project area from the historical deforestation rates in the reference region, latest non public figures (preliminary results) from the San Martin regional roundtable on REDD “Mesa REDD San Martin” indicate that deforestation rate could have been reduced in the last years from 2006 to 2010, lowering to an average annual rate of 0.50%.

Conservatively, we will use this annual deforestation rate as a basis for future deforestation. Baseline scenario will be refined with the latest results from the Mesa REDD San Martin when they will be published (June 2012)

Moreover, it is well documented that deforestation rates decrease when forest areas are gradually disappearing. This is called the “forest transition” theory (Mather and Needle, CL (1998). This scarcity factor was calibrated in a conservative way by using a land-use change model. Vast forest areas which are initially characterized by rapid deforestation rates, stabilize their forest area after some time. To incorporate a decrease in deforestation rate upon a gradual depletion of forest resources, these initial deforestation rates were multiplied with a forest scarcity factor, which is initially 1, but gradually decreases as the proportion of remaining forest decreases (Table 17).

Deforestation will start to decrease when around 50% of the current forest area in is deforested, and almost completely stops when around 80% of the forest area has disappeared. A very similar pattern was reported by Meyfroidt and Lambin (2008, Forest transition in Vietnam and its environmental impacts. *Global Change Biology*, 14 (6), 1319-1336)¹⁵ in Vietnam. Deforestation rates started decreasing when 50% of forest cover remained, and halted in 1991-1993 at around 25% forest cover.

Figure 28 : Relative Deforestation Rate as a Function of Proportion of Initial Forest Area that is Deforested



Source : Meyfroidt P, Lambin EF (2008), Forest Transition in Vietnam and its environmental impacts. *Global Change Biology*, 14(6), 1319-1336

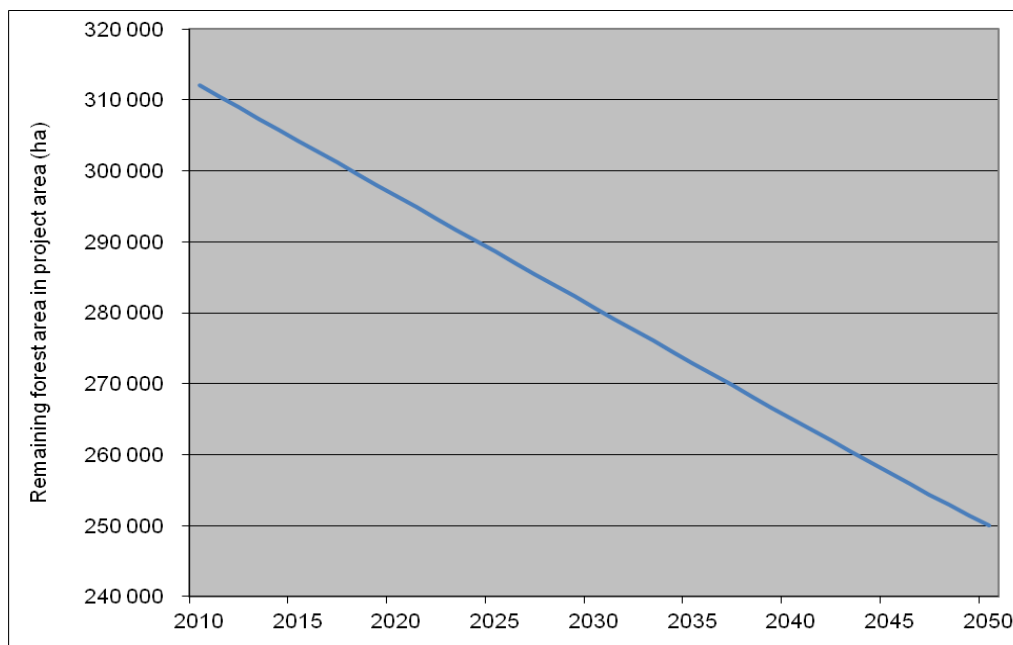
In our case, at start, the whole area (Province of San Martin) is deforested at 33.69 % (2006 figure). We keep a rate of 0,50 % until we reach 50 % of the region as deforested, then the relative deforestation rate applies, until we reach 80 to 90 % of deforested area for the region of San Martin, where the actual deforestation rate becomes close to none.

TABLE 14: Projected deforestation under baseline scenario

BASELINE SCENARIO								
Year	Deforestation rates				San Martin Region		Biocorridor Martin Sagrado project area	
	Annual deforestation rate used as basis (%)	Projected deforested area (%)	Relative Deforestation Rate (%)	Yearly deforestation rate adjusted with relative factor	Deforested area per year (ha / year)	Cumulative deforested area (ha)	Deforested area per year (ha / year)	Cumulative deforested area (ha)
2006	0,50%	33,7	100%	0,50%	25 896	1 744 790		
2007	0,50%	34,2	100%	0,50%	25 896	1 770 686		
2008	0,50%	34,7	100%	0,50%	25 896	1 796 582		
2009	0,50%	35,2	100%	0,50%	25 896	1 822 477		
2010	0,50%	35,7	100%	0,50%	25 896	1 848 373	1 568	1 568
2011	0,50%	36,2	100%	0,50%	25 896	1 874 269	1 568	3 137
2012	0,50%	36,7	100%	0,50%	25 896	1 900 165	1 568	4 705
2013	0,50%	37,2	100%	0,50%	25 896	1 926 060	1 568	6 274
2014	0,50%	37,7	100%	0,50%	25 896	1 951 956	1 568	7 842
2015	0,50%	38,2	100%	0,50%	25 896	1 977 852	1 568	9 411
2016	0,50%	38,7	100%	0,50%	25 896	2 003 748	1 568	10 979
2017	0,50%	39,2	100%	0,50%	25 896	2 029 643	1 568	12 547
2018	0,50%	39,7	100%	0,50%	25 896	2 055 539	1 568	14 116
2019	0,50%	40,2	100%	0,50%	25 896	2 081 435	1 568	15 684
2020	0,50%	40,7	100%	0,50%	25 896	2 107 331	1 568	17 253
2021	0,50%	41,2	100%	0,50%	25 896	2 133 226	1 568	18 821
2022	0,50%	41,7	100%	0,50%	25 896	2 159 122	1 568	20 390
2023	0,50%	42,2	100%	0,50%	25 896	2 185 018	1 568	21 958
2024	0,50%	42,7	100%	0,50%	25 896	2 210 914	1 568	23 527
2025	0,50%	43,2	100%	0,50%	25 896	2 236 809	1 568	25 095
2026	0,50%	43,7	100%	0,50%	25 896	2 262 705	1 568	26 663
2027	0,50%	44,2	100%	0,50%	25 896	2 288 601	1 568	28 232
2028	0,50%	44,7	100%	0,50%	25 896	2 314 497	1 568	29 800
2029	0,50%	45,2	100%	0,50%	25 896	2 340 392	1 568	31 369
2030	0,50%	45,7	100%	0,50%	25 896	2 366 288	1 568	32 937
2031	0,50%	46,2	100%	0,50%	25 896	2 392 184	1 568	34 506
2032	0,50%	46,7	100%	0,50%	25 896	2 418 080	1 568	36 074
2033	0,50%	47,2	100%	0,50%	25 896	2 443 975	1 568	37 642
2034	0,50%	47,7	100%	0,50%	25 896	2 469 871	1 568	39 211
2035	0,50%	48,2	100%	0,50%	25 896	2 495 767	1 568	40 779
2036	0,50%	48,7	100%	0,50%	25 896	2 521 663	1 568	42 348
2037	0,50%	49,2	100%	0,50%	25 896	2 547 558	1 568	43 916
2038	0,50%	49,7	100%	0,50%	25 896	2 573 454	1 568	45 485
2039	0,50%	50,2	99,8%	0,50%	25 844	2 599 298	1 565	47 050
2040	0,50%	50,7	99,5%	0,50%	25 766	2 625 064	1 561	48 611
2041	0,50%	51,2	99,2%	0,50%	25 689	2 650 753	1 556	50 166
2042	0,50%	51,7	98,5%	0,49%	25 507	2 676 260	1 545	51 711
2043	0,50%	52,2	98,0%	0,49%	25 378	2 701 638	1 537	53 248
2044	0,50%	52,7	97,4%	0,49%	25 222	2 726 860	1 528	54 776
2045	0,50%	53,2	96,8%	0,48%	25 067	2 751 928	1 518	56 294
2046	0,50%	53,6	96,2%	0,48%	24 912	2 776 839	1 509	57 803
2047	0,50%	54,1	95,5%	0,48%	24 730	2 801 570	1 498	59 301
2048	0,50%	54,6	94,8%	0,47%	24 549	2 826 119	1 487	60 788
2049	0,50%	55,1	94,0%	0,47%	24 342	2 850 461	1 474	62 262
2050	0,50%	55,5	93,0%	0,47%	24 083	2 874 544	1 459	63 721
Actual Deforestation at project end :						55,5%		20,3%

It is predicted that 20,3 % of the forest in the project area may disappear under the baseline scenario in the project area within the 40 years, after applying relative deforestation rates.

FIGURE 29: Remaining forest area (in ha) in the project area under baseline conditions as a function of time



G.2.3.3. Impact on carbon stock changes

We have seen (see section G.1.4) that carbon stocks in living biomass in project area at the start of the project is 532 t CO₂/ha. (IPCC value for tropical humid mountain forests in America)

When applying the relative deforestation rate for the baseline scenario, we get in terms of carbon stock change for the project area:

TABLE 15: Projected carbon changes in the project area under baseline scenario

BASELINE SCENARIO				
Year	Biocorridor Martin Sagrado project area			
	Deforested area per year (ha / year)	Cumulative deforested area (ha)	Net change in carbon stock per year (T CO ₂ e / year)	Cumulative net change in carbon stock (T CO ₂ e)
2006				
2007				
2008				
2009				
2010	1 568	1 568	-834 407	-834 407
2011	1 568	3 137	-834 407	-1 668 815
2012	1 568	4 705	-834 407	-2 503 222
2013	1 568	6 274	-834 407	-3 337 630
2014	1 568	7 842	-834 407	-4 172 037
2015	1 568	9 411	-834 407	-5 006 445
2016	1 568	10 979	-834 407	-5 840 852
2017	1 568	12 547	-834 407	-6 675 259
2018	1 568	14 116	-834 407	-7 509 667
2019	1 568	15 684	-834 407	-8 344 074
2020	1 568	17 253	-834 407	-9 178 482
2021	1 568	18 821	-834 407	-10 012 889
2022	1 568	20 390	-834 407	-10 847 296
2023	1 568	21 958	-834 407	-11 681 704
2024	1 568	23 527	-834 407	-12 516 111
2025	1 568	25 095	-834 407	-13 350 519
2026	1 568	26 663	-834 407	-14 184 926
2027	1 568	28 232	-834 407	-15 019 334
2028	1 568	29 800	-834 407	-15 853 741
2029	1 568	31 369	-834 407	-16 688 148
2030	1 568	32 937	-834 407	-17 522 556
2031	1 568	34 506	-834 407	-18 356 963
2032	1 568	36 074	-834 407	-19 191 371
2033	1 568	37 642	-834 407	-20 025 778
2034	1 568	39 211	-834 407	-20 860 186
2035	1 568	40 779	-834 407	-21 694 593
2036	1 568	42 348	-834 407	-22 529 000
2037	1 568	43 916	-834 407	-23 363 408
2038	1 568	45 485	-834 407	-24 197 815
2039	1 565	47 050	-832 739	-25 030 554
2040	1 561	48 611	-830 235	-25 860 789
2041	1 556	50 166	-827 732	-26 688 521
2042	1 545	51 711	-821 891	-27 510 413
2043	1 537	53 248	-817 719	-28 328 132
2044	1 528	54 776	-812 713	-29 140 845
2045	1 518	56 294	-807 706	-29 948 551
2046	1 509	57 803	-802 700	-30 751 251
2047	1 498	59 301	-796 859	-31 548 110
2048	1 487	60 788	-791 018	-32 339 128
2049	1 474	62 262	-784 343	-33 123 471
2050	1 459	63 721	-775 999	-33 899 470

Note: This does not include leakage. See climate section for that impact and the total net carbon credits available for distribution. Non-CO2 emissions are fully included in the project's calculations when significant. The test of whether a non-CO2 emission source is significant is described in the Climate section. This section also contains an overview of all emissions sources from non-CO2 emissions and fuel related emissions from project activities.

G2.4. Description of How the 'Without Project' Scenario Would Affect Communities

Without the project it is likely that the communities of the area will increasingly lose control over the forest. These communities depend on the forest for a wide range of products including foods, house construction, fuel-wood, timber, medicinal plants and seeds.

Loss of access to these resources will create economic hardships for local communities and undermine the achievements of the Millennium Development Goals. Encroachment of these forests by private corporations and migrants will also likely generate social conflicts in the area. Not only will forest cover be lost and environmental services weakened (including biodiversity and hydrological functions, especially for crops), local communities will experience diminishing access to forest resources. This will lead to social and economic marginalization and possible displacement of these rural families, and potentially create conflict between concessionaires, migrants, and local populations.

An additional component of the non-project scenario is the deterioration of hydrological services essential to the lives of rural families. They depend on water for domestic supplies and their agriculture is rain fed, the forest ensures good levels of rainfalls and water stocking. The clearing of forests will adversely impact water resources, including possible change to micro-climate. Since agriculture is almost exclusively rain-fed, declining rainfall and soil moisture will likely cause declines in family farm productivity. Without revenues from carbon sales, including agricultural intensification, water resource development, or NTFP processing, activities geared to enhance community livelihood will not take place.

The province has experienced severe erosion as forest cover has been removed. Erosion problems have accelerated over the past decade. This region experiences an extended dry season and often torrential wet season.

Forest conservation is a key element in any strategy to preserve Peru's complex hydrological systems and avoid further loss of soil through erosion. During the extended dry season, many rural areas in San martin Province experience chronic water shortages. Forest loss exacerbates these drought conditions by creating a hotter microclimate and accelerating water run-off rates. Without the project, land degradation will be more extensive; there will be greater soil erosion and reduced water infiltration and aquifer recharge.

G2.5. Description of How the 'Without Project' Scenario Would Affect Biodiversity

In the absence of the project it is likely that forest habitat in the project area will be reduced by 15% in the next 40 years through land clearing, illegal logging and slash and burn practices. In addition, forest degradation will reduce the density of the understory vegetation and disrupt the natural age distribution of trees, leading to a substantial loss of habitat.

The reduction of key habitat will place pressure on already-stressed flora and fauna. Without the project, community efforts to control poaching and regulate hunting will not be implemented. High market prices and growing demands for luxury hardwoods (often originating from endangered and slowly growing tree species) in Peru have placed growing pressures on forests, with much of this valuable timber harvested illegally. Logging bans and the decline of natural forest resources in Brazil have increased the pressure on

Peru's forests. Many of the species with the highest value are already listed on the IUCN threatened species list. As these trees and forests are depleted, so too are important indigenous sources of seed, reducing the potential for regeneration. In addition, hunting and poaching are common, resulting in an increasing number of endangered fauna species. Finally, the clearing of forest for commercial agriculture is rapidly reducing the habitat for many flora and fauna species, and reducing biodiversity. The rampant deforestation will almost certainly lead to the extinction of the last feline population in Peru (pantera onca in particular).

G3. Project Design and Goals

G3.1. Summary of Project's Major Climate, Community, and Biodiversity Objectives

Climate Objectives

The project is designed to mobilize the communities in the project zone, to avoid further deforestation and degradation, as well as facilitate the natural regeneration of Martin Sagrado and neighbouring forests. This will lead to an avoided emission net impact of **28 259 000 Tons of CO₂ eq** (before leakage), over the 40 year project (see Climate chapter). The project will develop and demonstrate a carbon finance mechanism to reduce greenhouse gas emissions, contribute to economic and social development, and conserve biodiversity over the next 40 years.

Principle project strategies include building the capacity of local communities, and of ACOPAGRO and APAHUI managers, field workers to conserve community forests, as the primary managers of REDD project forests, creating a strong coalition of stakeholders who are committed to achieving the project goals including supporting villagers to improve the quality of forests, maximizing benefits flows to local communities participating in the project, and studying and developing additional REDD projects.

Operationally, the success of the project depends on strengthening community capacity to protect local forests through legal recognition and technical and financial support. The institutional, logistical, and political support of the Amazonia Viva Foundation and local government may as well enhance the effectiveness of community efforts to protect forests. Community managed assisted natural regeneration, enrichment planting activities and agro-forestry following agro-ecological practices are planned to enhance carbon sequestration in degraded forests and reduce soil erosion, while improving forest livelihoods and local employment opportunities. The emphasis on community involvement will maximize the longevity of the sequestered carbon, and minimize the risk of losing the carbon assets. In addition, by increasing biodiversity in these forests, especially the number of birds, reptiles, and amphibians, the risks of farm pests will be reduced. Through supporting and documenting the role communities play in forest carbon conservation and sustainable management, Amazonia Viva and Pur Projeet seek to provide "proof of concept" to the Government of Peru and to the donor community that will encourage the replication of this strategy as a national program.



The long-term goals of this project are to sequester carbon, contribute to the devolution of forest management rights to poor, and demonstrate the viability of utilizing carbon offset credits to finance the national forest management program.

Community Objectives

The project seeks to ensure the security of families in the project community and to assist them by increasing employment opportunities and livelihood on a sustainable basis from their natural resources. The project will strengthen community leadership, organizational and financial capabilities, improve relationships with local government, help resolve resource conflicts, and educate farmers and

neighbouring communities on forest management and biodiversity. Community bookkeeping and project management skills will be developed as a major goal of the project, while project funds will be used to build capital reserves.

In addition, new micro-finance groups will be created to help manage non-timber forest product enterprises. Training, technical support, and funding for forest-based livelihood activities (such as the sustainable extraction of non-timber forest products) and the extension and adoption of more productive and sustainable agricultural practices will also be provided by the project (namely agro-forestry). Community eco-tourism activities will be encouraged too and economic development via micro-credit activities.

Biodiversity Objectives

This project will contribute to the protection and conservation of Peru endangered flora and fauna in tropical rainforests by supporting the engagement of rural communities as resident managers. Forest regeneration will be facilitated with enrichment planting of endangered species to increase the quantity and quality of available habitat. Project staff will facilitate community dialogues and provide technical guidance regarding effective practices for conserving flora and fauna. Project communities will also conduct regular monitoring of biodiversity with support from the project staff. High Conservation Value areas mentioned before will not be negatively affected.

Though the project area consists only of the three concessions Martin Sagrado, El Breo, and Monte Cristo, the surrounding area and neighbouring communities will be positively affected by project implementation.

G3.2. Description of Each Project Activity

The project will undertake eight main different categories of activities to achieve reduced degradation and deforestation. Each of these activities targets one or more of the below identified deforestation drivers (table 16).

Formalizing and reinforcing legal land-tenure of the area directly affects migrant encroachment and the concession-type deforestation drivers. It is clear from previous analysis that community respect and acceptance of legal status and laws is absolutely essential in the success of the project. Other project activities may be highly inefficient if the communities involved do not have enforced legal rights and ownership feeling to the land. To optimize the efficiency of the project activities, these activities are incrementally implemented, with reinforcement of land-tenure status being the first project activity. Because of this incremental implementation, the total benefits accrued from the project of the project activities will increase gradually over time. This is explicitly taken into account into the carbon calculations.

TABLE 16 : Summary of Project Activities Categories and their effectiveness on each driver

Drivers of deforestation / Activities	Contribution DF (d) Relative importance of driver to total deforestation (%)	Effectiveness (a,d) : Relative reduction in the impact of driver due to activities (%)								
		Legal	Control & Surveillance	Sensibilization & communication	Non Timber forest valuation	Scientific & Inventory	Renewable Energy	Reforestation in agroforestry models	Coordination, Expansion & Transmission	Total
		1. Conversion to croplands, pastures and housing	70%	10%	20%	15%	15%	5%		10%
2. Conversion to settlements / infrastructure (Roads, water and electricity)	15%	15%	25%	20%		5%	5%		15%	85%
3. Selective logging of high-value species for commercial sales	10%		30%	20%	15%	5%		5%		75%
4. Timber harvesting for local use (housing and infrastructures)	1%			50%			10%	10%	20%	90%
5. Fuelwood gathering	1%			20%			30%	10%	10%	70%
6. Uncontrolled fires	2%		30%	40%					20%	90%
7. Intentional fires (Paths opening and fires for hunting)	1%		30%	15%	30%	5%			20%	100%
8. Mining and Hydrocarbon activities encroachment	0%	40%			40%				20%	100%
9. Economic land concession (timber and agriculture)	0%	50%			50%					100%
Effectiveness of activity on total deforestation		9,3%	21,7%	17,2%	12,3%	4,8%	1,2%	7,7%	3,2%	77,2%

This section contains a description on how each of these activities affects each of the drivers. It is also described how the effectiveness of each of these activities changes throughout the project's lifetime due to gained experience, or differences in funding. The relative effectiveness refers to the effectiveness relative to what is maximally achievable given the project's conditions, but may be different from this maximum due to timing of funding or lack of experience. In other words, the relative effectiveness will always be 100% at some point during the crediting period, regardless of the absolute effectiveness of the activity in reducing deforestation.

Figure 30 : Overview of project activities and estimated budget

Activity category	Activity	2010-2015	2015-2050
		Budget (€)	Budget (€)
TOTAL		1 843 951	26 706 486
1 - Legal	Elaboration of maps Martin Sagrado	1 081	-
	Registration of Martin Sagrado concession	892	-
	Demarcation and registration of Monte Cristo concession	10 811	-
	Delimitation and elaboration of maps concessions Pucapillo & Santa Rosa	2 703	-
	Registration of Pucapillo and Santa Rosa Concession	5 405	-
	Elaboration and revision of Management plans ("Plan de manejo") to maintain concession rights	54 054	189 189
	Legal assistance (lawyers) to get court decision on migrants invasion in conservation area	-	81 081
	Activation and Monitoring of unique registers of associations	6 757	108 108
2 - Control & Surveillance	Construction and maintenance of 6 control checkpoints at entry points of the project area	27 027	324 324
	Land demarcation and landmarks construction, maintenance, and replacement	5 405	40 541
	Sub-Landmarks construction, maintenance, and replacement	4 865	216 216
	Forest guarding. 12 forest guards	116 757	2 043 243
	Boat and equipments for patrolling (Purchase, maintenance, replacement)	16 216	162 162
3 - Sensibilization & Communication	Painting of 15 boats to the colors of conservation and Fundacion San Martin Verde	5 541	54 054
	T-shirts Fundacion San Martin Verde for all communities involved and surrounding communities (2000 T-shirts)	11 843	94 595
	Installation , improvement, extension, and maintenance of Community radios	541	10 811
	Radio host and programmation for Radios	1 622	56 757
	Local promotional and education material	8 108	121 622
	Educational field visits for schools in conservation area	13 514	121 622
	Local external communication especially via local transport companies and agencies.	-	135 135
	Compensations for local promoters and trainers of the program HEM	40 541	324 324
4 - Non timber forest valuation	Design, creation, and management of Botanical Garden to value flora biodiversity present in the forest and sell plants extracts locally	10 811	216 216
	Medicinal plants: seeds extraction and tre nursery activities to sell	4 054	108 108
	Seeds extraction activity and elaboration of tree nurseries	6 757	108 108
	Construction, expansion, and maintenance of base centers in neighbouring communities (Santa Rosa, Huicungo, La Morada, etc.) to facilitate access to the concession and develop activities : eco-tourism, scientific and press trips, showroom of the concession activities	40 541	540 541
	Ecoturism activities: tours to discover landscape, fauna and flora inside the concessions	16 216	121 622
	Equipment and developpement of conservation area for ecoturism : paths, miradors, etc.	40 541	540 541

5 - Scientific & Inventory	Elaboration of the technical study (Expediente tecnico) for all concessions area	32 432	-
	Inventory management : monitoring of biodiversity	10 811	216 216
	Specific scientific studies: link with water, food security and sovereignty, cocoa yields, etc.	10 811	162 162
	Reporting to regional, national and international authorities and institutions, research publications.	-	27 027
6 - Renewable Energy	Implementation of distribution channel for solar panels and solar lamps and coordination	2 703	40 541
	Implementation of improved cookstoves in communities	2 703	135 135
7 - Reforestation in agroforestry models	Plantation of timber trees in agroforestry systems in surrounding communities	324 324	1 621 622
8 - Local Project management and coordination. Expansion, training, and empowerment of communities	Supervision of conservation activities, management of San Martin Verde Foundation, and coordination with government.	28 541	397 297
	Coordination of all legal and administrative processes. Expansion and empowerment of communities.	21 405	249 730
	Training and assistance of farmers and community members in conservation activities	48 000	749 189
	Management of conservation activities by forestry engineers	14 270	499 459
	Construction, Expansion and maintenance of offices buildings in concessionaires communities.	54 054	162 162
	Empowerment of Asociacions members of San Martin Verde and contractualization of procedures	486	18 919
9 - Coordination with local authorities	Implication and participation in Mesa REDD San Martin	405	1 351
	Meeting and coordination with regional government (ARA) for formalization of concessions	676	4 054
	Field visit of Regional Government's representants	1 351	6 757
10 - Project certification	External forestry expertise and technical assistance in monitoring (ONFI)	5 000	200 000
	Certification costs CCBA	25 000	250 000
	Certification costs VCS	30 000	300 000
11 - External partners and network for project strengthening, distribution and promotion	Field visit of partners, prospective clients; base camp installation in the concession for welcoming the partners	4 054	27 027
	Project presentation and promotion (European and US network), PPA (Pure Planet Alliance), and Consortium. Lobbying, Media, advertising, partnership and conferences.	13 514	189 189
	International promotion and recognition (UNEP, IUCN, UNESCO, Bio Fund)	13 514	405 405
Other unplanned activities	Other unplanned activities to fight new deforestation threats		5 405 405
Provisions for local risks (activities)	Provisions for miscellaneous risks (equipment breakdowns, landmarks destructions, fires, flooding, etc.). This provision is allocated to future project expenses of the first crediting period and released in case of damages on project activities or materials or unexpected exceptional expenses.	60 811	1 081 081
Provisions for future project local expenses (activities)	Project long term future expenses (crediting periods 2016-2050). Provision made to cover future verifications at each crediting period end, and minimum monitoring requirements for the project follow-up until project end.	60 811	1 081 081
Provisions for taxes	Provision for payment of government taxes on sales of environment services	162 162	1 621 622
Insurance	Insurance policy	13 514	135 135
Project Management Pur Projet	Project implementation and management Pur Projet on site. Preparation for validation, monitoring, technical assistance	450 000	6 000 000

G.3.2.1. Legal

Land tenure formalization :

Land is the single most important asset for most Peruvians, as economic and social lives are inexorably tied to the use of natural resources. Transparently assuring land-tenure rights structures is of upmost importance both to the livelihoods of local populations and the prevention of unregulated and unsustainable land use.

Project area:

The land-tenure status is clear but it has not been formally demarcated. First legal priority is to formalize the legal tenure of the project area, through the finalization of attribution and registration of the three concessions for conservation. This includes elaboration of maps and technical files for the attribution process, accompany the communities in the formal process of concession solicitation, elaboration of the management plan for the concession. The Asociacion Dos De Mayo already has the concession El Breo attributed. The concession Martin Sagrado is being (Dec 2011) attributed to ACOPAGRO. APAHUI has solicited the concession Monte Cristo to the government.

Project zone:

Also, conventional land tenure for forest areas does not always extend to tenure over housing and agricultural lands, and a lack of protection for agricultural lands can lead to families moving deeper into forest areas to clear new patches. In the project zone, all of the farmers have clear land use rights as they have been there and cultivating their land for more than 5 years. However, only half of the farmers legally own the land on which they settle and use for agriculture. As part of the project, Amazonia Viva foundation will work with the regional government to prioritize land titling for the participating farmers who don't own a legal land title yet.

A cadastral plan has to be developed too, to manage the land use between agricultural land and forest preservation areas. By establishing legally-binding forest management agreements, this will help secure the community forest. This action provides exclusive management rights and responsibilities to the communities over the project area, greatly enhancing their ability to protect and conserve these resources.

Legal enforcement:

Without legal enforcement, maintaining tenure over land against migrants or concessionaries is extremely difficult. The establishment of these agreements often requires financial resources to implement, which can be generated by sales of carbon credits from the project. These financial resources can also be used for forest monitoring and patrolling programs, as well as forest boundary demarcation to ensure that migrant populations do not encroach on forest lands part of the Martin Sagrado reserve.

Maintaining formal land-tenure rights is also important in ensuring that agriculture lands are not granted to large corporations as ELCs or as timber concessions to harvest luxury woods. The creation and reinforcement of land tenure rights can effectively accomplish this by granting land rights to communities and ensuring this land is not taken through ELC or exploited by in-migration. The Amazonia Viva Foundation will also be responsible for meeting with new migrant communities and leaders, as well as the local government to clarify boundaries of the project area, resolve any existing conflicts, and emphasize the intention of the AMAZONIA VIVA foundation to secure the area.

Forest management plan:

While the local village leaders are consulted in land allocation activities, there are currently no land-use plans for the project areas. However, developing forest management plans in a collaborative fashion is a key element in sustainable resource management. The project will support the communities in developing

land and water resource development plans in a participatory and democratic manner. The plans contain guidelines on the amount of timber each person can harvest, based on current and future timber needs, and how much land within the project sites can be converted in the future for expansion of settlements and cropland.

The forest management plans also identify areas for assisted natural regeneration and enrichment planning. Areas of high biodiversity, hydrological value and High Conservation Areas are identified for special management. The forest management plans increase the efficiency of the current land-use, and take into account the increased need for land for settlements and agriculture in the future. By planning the future conversion and avoiding the random conversion of forest patches, forest degradation along settlement and cropland edges is reduced.

The development of forest management plans requires community-wide discussion on how to best manage natural resources, emphasizing the inclusion of all stakeholders. This policy of inclusion cultivates a feeling of resource ownership, motivating sustainable land use practices. The project guides communities in identifying appropriate areas for future settlement and agricultural expansion while clarifying and demarcating areas for permanent forest conservation. Often the need for new settlement or agricultural space leads to the degradation of forest lands. The involvement of knowledgeable local stakeholders and outside experts allows for the realization of technical and sustainable methods of expansion. During the stakeholder meetings, there are also discussions on how the forest should be managed with respect to the use of fire to “clean” the land. For this, the technical support of the ACOPAGRO and APAHUI cooperatives’ and Amazonia Viva’s technicians is key. Additionally, participatory land-use planning can also provide guidance and rules in case of disputes or conflict over land or resources.

Land-use planning procedures include the preparation of large scale maps (1:25,000) of the project area with zoning information that is posted in the community meeting room. The resource management plan maps are used for resource related discussions, annual work-plan development, fire management, and other spatial monitoring needs. Data from maps are transferred into the project GIS data base on an annual basis.

The potential of the proposed REDD+ project to generate carbon revenues for forest management has been instrumental in generating an action plan to resolve tenure conflicts in the project area through meetings, workshops, site visits, as well as higher level policy discussions.

Legal formalization and enforcement are a key backbone of the project to secure the forest areas. It is estimated to contribute to an overall 9.3 % of the protection of the forest against the different drivers of deforestation. It is particularly effective against oil exploration, large economic land concessions and timber concessions as it commits the communities to conservation and prevents the community or members of the community to sign a contract with these economic players.

TABLE 17 : Legal: effectiveness on reducing deforestation for each driver

	Contribution DF (d)	Relative reduction in the impact of driver due to activities (%)
Drivers of deforestation / Activities	Relative importance of driver to total deforestation (%)	Legal
1. Conversion to croplands, pastures and housing	70%	10%
2. Conversion to settlements / infrastructure (Roads, water and electricity)	15%	15%
3. Selective logging of high-value species for commercial sales	10%	
4. Timber harvesting for local use (housing and infrastructures)	1%	
5. Fuelwood gathering	1%	
6. Uncontrolled fires	2%	
7. Intentional fires (Paths opening and fires for hunting)	1%	
8. Mining and Hydrocarbon activities encroachment	0%	40%
9. Economic land concession (timber and agriculture)	0%	50%
Effectiveness of activity on total		9,3%

G.3.2.2. Control and Surveillance

This strategy involves supporting the community members as they improve the pathways, demarcate forest boundaries, construct and maintain walkways, and patrol/protect forest areas. Project support provides training in management planning, uniforms, communication equipment, patrol huts, boundary markers and signage, and employment. These actions increase the legitimacy of patrol groups in the eyes of outsiders and enhance status of AMAZONIA VIVA Foundation members in their local communities. In addition, the project seeks to strengthen cooperative relationships between the local Amazonia Viva staff, police, and military effort in order to create a unified group of stakeholders that can prevent further forest encroachment, illegal logging, forest fires set by humans and poaching.

Similarly, forest protection activities prevent the unsustainable harvesting of fuel-wood and timber for local use. The project will provide financial support to local staff to develop a quick-response mobile unit to react to illegal forest activities in cooperation with local government, police, and military.

Illegal logging risks will be mitigated through a number of measures including demarcating boundaries and posting signage, blocking tractor access through trenching and other methods, regular patrolling, development of a network of patrol huts and fire roads to facilitate rapid movement, rapid response and confiscation of chainsaws and other equipment, and improve communications through the use of mobile phones.

Migrant encroachers for illegal logging or to slash and burn require a minimum amount of time, at least one week, to clear the forest to establish a settlement on encroached land. Routine weekly forest patrols and increased monitoring activity will ensure migrant encroachers are unable to settle, or are removed quickly.

In addition, a case tracking system would be set up so that the prosecution of major offenders can be followed through.

The project would support the Amazonia Viva Foundation, ACOPAGRO and APAHUI cooperatives, local authorities, NGOs, and other partners to create a cell-phone network to act as an early warning system to control illegal forest activities. Cell phone communications provides a low-cost way to strengthen coordination among the inter-organizational enforcement team. Text messages sent to all participating communities are a rapid way to inform communities of fire or other threats. Workshops and meetings would be held to build team relationships, ACOPAGRO and APAHUI cooperatives are key to that aspect. Previous work with the communities has already increased their awareness and sensitivity to their land rights.

Overall, the control and surveillance activities will contribute to an estimated 22% of avoided deforestation and degradation.



TABLE 18 : Control and surveillance: effectiveness on reducing deforestation for each driver

	Contribution DF (d)	Relative reduction in the impact of driver due to activities (%)
Drivers of deforestation / Activities	Relative importance of driver to total deforestation (%)	Control & Surveillance
1. Conversion to croplands, pastures and housing	70%	20%
2. Conversion to settlements / infrastructure (Roads, water and electricity)	15%	25%
3. Selective logging of high-value species for commercial sales	10%	30%
4. Timber harvesting for local use (housing and infrastructures)	1%	
5. Fuelwood gathering	1%	
6. Uncontrolled fires	2%	30%
7. Intentional fires (Paths opening and fires for hunting)	1%	30%
8. Mining and Hydrocarbon activities encroachment	0%	
9. Economic land concession (timber and agriculture)	0%	
Effectiveness of activity on total		21,7%

G.3.2.3. Sensibilization & Communication

Sensibilization of the communities, the local stakeholders, and the government is critical in raising the awareness of the necessity of conservation. Local stakeholders must understand the importance and the benefits of preserving for them of for the region.

Also we have observed that this ambitious program for avoided deforestation adn conservation must gain a great momentum to become effective and efficient. A way of gathering people, communities, other stakeholders around this conservation subject is to develop important communication on the project existence, the development of project activities. This can be done through the distribution of T-shirts branded to the conservation project, painting of the boats which are the common way of going around, leaflets, exhibitions, as well as of course regular visits to all communities.

It is also critical to make the communities feel directly implicated and part of the success of the project. In this sense, development of communication tools such as community radios, exhibitions, participation in concurses is key for the communities involved to be able to share their experience, communicate on their actions, their difficulties and their successes, and also to increase proudness of the communities in the project

Since the beginning of the projectin 2010, a large part of the budget has been spent in communication and sensibilization activities, which allowed to create an important momentum on the region for conservation, to get onboard the project new communities adn new organizations (APAHUI, Pucalpillo, etc.), and to also get the full support of the regional government. Also, it is to be noted that this intense communication may have contributed to the the recent increased focus of the regional government on conservation and environmental stakes, the suppression of concessions attribution to oil and mining companies. Also, the number of sollicitations for concessions for conservation has increased dramatically in the last year, likely due to the huge momentum created by the communication around the reforestation adn conservation projects, the creation of Amazonia Viva Foundation.



Overall, sensibilization and communication is estimated to have an impact of 17% on overall avoided deforestation and degradation.



**TABLE 19 : Sensibilization & Communication:
effectiveness on reducing deforestation for each driver**

	Contribution DF (d)	Effectiveness (a,d) : Relative reduction in the impact of driver due to activities (%)
Drivers of deforestation / Activities	Relative importance of driver to total deforestation (%)	Sensibilization & communication
1. Conversion to croplands, pastures and housing	70%	15%
2. Conversion to settlements / infrastructure (Roads, water and electricity)	15%	20%
3. Selective logging of high-value species for commercial sales	10%	20%
4. Timber harvesting for local use (housing and infrastructures)	1%	50%
5. Fuelwood gathering	1%	20%
6. Uncontrolled fires	2%	40%
7. Intentional fires (Paths opening and fires for hunting)	1%	15%
8. Mining and Hydrocarbon activities encroachment	0%	
9. Economic land concession (timber and agriculture)	0%	
Effectiveness of activity on total deforestation		17,2%

G.3.2.4. Non timber forest valuation

The project plans several livelihood enhancement activities to boost the incomes of project participants and in neighbouring communities. These include seeds extraction and tree nurseries, enhancing production, processing, and marketing of non-timber forest products including cocoa, essential oils, traditional medicinal plants, eco-tourism, and other income generating activities, and productivity increase. Cultural activities generating income are part of this too. A micro-credit fund is made available for communities members to start non timber activities.

The sale of non-timber products will help to increase rural income, shifting the burden from the sale of agricultural and timber products, and reducing the need for cropland. The project will also assist communities in establishing micro-finance accounts that can receive small grants from carbon income, allowing capital formation to be used for revolving loans for education, health, and small enterprise development. Small grants will be awarded to farmer-innovators who wish to perform trials of new sustainable farming system techniques.



The project will develop similar activities in the leakage area and with all the neighboring activities. A detailed plan and monitoring will be included and appended to this PDD, following the discussions with the neighbouring communities.

Non-timber forest product development activities are supported during the full timespan of the project. Similar as to agricultural intensification measures, a period of 5 to 10 years is assumed before these will be fully effective because marketing networks must be developed, etc. A final adoption rate of 50% is assumed after terminating the project's support for these activities. Together with legal contracting they are the main backbone of the project success.

TABLE 20 : Non-timber forest valuation: effectiveness on reducing deforestation for each driver

	Contribution DF (d)	Effectiveness (a,d) :
Drivers of deforestation / Activities	Relative importance of driver to total deforestation (%)	Non Timber forest valuation
1. Conversion to croplands, pastures and housing	70%	15%
2. Conversion to settlements / infrastructure (Roads, water and electricity)	15%	
3. Selective logging of high-value species for commercial sales	10%	15%
4. Timber harvesting for local use (housing and infrastructures)	1%	
5. Fuelwood gathering	1%	
6. Uncontrolled fires	2%	
7. Intentional fires (Paths opening and fires for hunting)	1%	30%
8. Mining and Hydrocarbon activities encroachment	0%	40%
9. Economic land concession (timber and agriculture)	0%	50%
Effectiveness of activity on total deforestation		12,3%

G.3.2.5. Scientific & Inventory

The project will realize scientific studies and inventories in the project area and in the project zone, in order to understand and publicize better the biodiversity richness of the project zone, as well as the environmental services brought by the forest.

Such scientific studies will include inventories of biodiversity (fauna and flora), inventory of biomass, and studies about link between forest and water cycle preservation, forest and food sovereignty, forest and climate, etc.

This improved knowledge and the results of the studies will help defend better the goals of conservation against potential future alternative for local communities (cropland extension) or for the local government (oil, mining concessions or ELCs)

These studies are also critical to target better which activities to develop and in which areas specifically in order to best preserve biodiversity, ecosystemic services, and natural resources.

Alltogether, it is estimated that scientific & Inventory activities will contribute to 4.8% of avoided deforestation and degradation.

Table 21 : Scientific & Inventory : effectiveness on reducing deforestation for each driver

	Contribution DF (d)	Effectiveness (a,d) : Relative reduction in the impact of driver due to activities (%)
Drivers of deforestation / Activities	Relative importance of driver to total deforestation (%)	Scientific & Inventory
1. Conversion to croplands, pastures and housing	70%	5%
2. Conversion to settlements / infrastructure (Roads, water and electricity)	15%	5%
3. Selective logging of high-value species for commercial sales	10%	5%
4. Timber harvesting for local use (housing and infrastructures)	1%	
5. Fuelwood gathering	1%	
6. Uncontrolled fires	2%	
7. Intentional fires (Paths opening and fires for hunting)	1%	5%
8. Mining and Hydrocarbon activities encroachment	0%	
9. Economic land concession (timber and agriculture)	0%	
Effectiveness of activity on total deforestation		4,8%

G.3.2.6. Renewable Energy

Even minor contributor, the development of renewable energy or more efficient energy-saving techniques to lower fuelwood consumption, is a key component to make people aware of the need to develop alternative sources of energy. During the various meetings, many farmers pointed as well this as a priority to them. In July 2010, a first batch of 150 solar panel lamps (of 2 different kinds), were handed over to the Pucapillo community by Pur Projet, as a start.

In some communities, farmers have been helped to upgrade their stoves to improved cooking stoves in order to reduce fuelwood consumption and to limitate smoke in the kitchen.

Also, the development of alternative sources of energy (solar, hydroelectric) could avoid the construction of electricity lines that would degrade or deforest the area. For example, an electric line has been planned

along the Huayabamba river up to upstream communities, and it will be necessary to remove some forest to build this line in a forested landscape. Were the communities to be self-sufficient in electricity with other sources, this line would not necessarily be necessary.

TABLE 22: Renewable energy: effectiveness on reducing deforestation for each driver

	Contribution DF (d)	Effectiveness (a,d) : Relative reduction in the impact of driver due to activities (%)
Drivers of deforestation / Activities	Relative importance of driver to total deforestation (%)	Renewable Energy
1. Conversion to croplands, pastures and housing	70%	
2. Conversion to settlements / infrastructure (Roads, water and electricity)	15%	5%
3. Selective logging of high-value species for commercial sales	10%	
4. Timber harvesting for local use (housing and infrastructures)	1%	10%
5. Fuelwood gathering	1%	30%
6. Uncontrolled fires	2%	
7. Intentional fires (Paths opening and fires for hunting)	1%	
8. Mining and Hydrocarbon activities encroachment	0%	
9. Economic land concession (timber and agriculture)	0%	
Effectiveness of activity on total deforestation		1,2%

G.3.2.7. Reforestation

Agroforestry in the projet zone (buffer zone of the project area):

Development in the buffer zone of the project area, where community lives, of agroforestry programs to plant native timber trees in the farmers' parcels. This reforestation activity aims at lowering the pressure of agriculture on surrounding forest (coco yield increase in agroforestry, limiting the need to expand cultivated areas), provide alternative source of fuelwood and timber to the communities (pruning and thinning products of reforested parcels), as well as raising communities awareness on forests. On top of that, the sales of trees at maturity (according to a sustainable management plan) will provide additional revenues for the farms, diversifying their incomes, and decreasing their need for other sources of revenues they could get from deforestation of the project area

The project will build upon Pur Projet's experience in reforestation programs developed with ACOPAGRO since 2008 in the same region.

Assisted Natural Regeneration :

In the project area itself, plantation in degraded areas of removed or missing species in order to recreate natural complete ecosystems and regenerate the biodiversity, carbon stocks of these high conservation value areas. In particular, in areas where illegal loggers have come to cut selectively high value tree species such as Tornillos, Cedars, the Assisted Natural Regeneration will replant these tree species to help recreate original conditions.

TABLE 23: Renewable energy: effectiveness on reducing deforestation for each driver

	Contribution DF (d)	Effectiveness (a,d) : Relative reduction in the impact of driver due to activities (%)
Drivers of deforestation / Activities	Relative importance of driver to total deforestation (%)	Reforestation
1. Conversion to croplands, pastures and housing	70%	10%
2. Conversion to settlements / infrastructure (Roads, water and electricity)	15%	
3. Selective logging of high-value species for commercial sales	10%	5%
4. Timber harvesting for local use (housing and infrastructures)	1%	10%
5. Fuelwood gathering	1%	10%
6. Uncontrolled fires	2%	
7. Intentional fires (Paths opening and fires for hunting)	1%	
8. Mining and Hydrocarbon activities encroachment	0%	
9. Economic land concession (timber and agriculture)	0%	
Effectiveness of activity on total deforestation		7,7%

G.3.2.8. Expansion, training and empowerment of communities

Training and empowerment of the communities on conservation ,sustainable agriculture and resources management are a key issue for project’s sustainability and will be mainly adressed by Amazonia Viva’s, Pur Projet’s, ACOPAGRO’s and APAHUI’s staff as well as the promoters in the communities. Training will be very wide and on multiple subjects, with in-field trainings and technical trainings, both on agro-forestry, forest management and the development of non-timber activities.

The communities need to feel onboard the project, implicated, and learning from the project. This only will ensure permanency and sustainability of the action.

Coordination and development with other neighbouring communities as well transmission to future generations is also very important to secure the sustainability of the project and limit leakage and risks from outside of the project area. It will help promote the project in the whole region of San Martin too.

Table 24: Expansion, Training, and Empowerment: effectiveness on reducing deforestation for each driver

	Contribution DF (d)	Effectiveness (a,d) : Relative reduction in the impact of driver due to activities (%)
Drivers of deforestation / Activities	Relative importance of driver to total deforestation (%)	Coordination, Expansion & Transmission
1. Conversion to croplands, pastures and housing	70%	
2. Conversion to settlements / infrastructure (Roads, water and electricity)	15%	15%
3. Selective logging of high-value species for commercial sales	10%	
4. Timber harvesting for local use (housing and infrastructures)	1%	20%
5. Fuelwood gathering	1%	10%
6. Uncontrolled fires	2%	20%
7. Intentional fires (Paths opening and fires for hunting)	1%	20%
8. Mining and Hydrocarbon activities encroachment	0%	20%
9. Economic land concession (timber and agriculture)	0%	
Effectiveness of activity on total deforestation		3,2%

G3.3. Map Identifying Location of Project Areas, Activities and Leakage Areas

Project area:

See map in Section G.1

Area of activities:

Activities of the categories Scientific and Inventory, Control and Surveillance, Assisted Natural Regeneration will take place directly inside the project area.

Activities of the categories Non-timber Forest Valuation, Reforestation in agroforestry, Training and Empowerment, Sensibilization and Communicaiton, Renewable energy will be conducted in all communities of the project zone. Mainly with the communities along the Huayabamba river, downstream of the project area, and natural acces to the project areas, but also with the communities to the North and North West, inside the Martin Sagrado concession (Canaan, Anazco Pueblo, La Morada) or outside of hte project are in the Andes (Chuquibamba, Leymebamba, Luz del Oriente, etc.).

Legal activities, coordination with local government, and Sensibilization and Communication will expand outside the project zone, in Juan Jui (headquarters of Amazonia Viva Foundation and ACOPAGRO cooperative, and closest city to the project area), in Tarapoto and Moyobamba, where the offices of the regional government are.

Figure 31: Map of project zone with area of main activities

(In bright yellow, the main areas of activities development)



Leakage area:

Leakage is expected to be low because of the presence around the project area of other protected areas or areas dedicated to conservation : to the South, the National Park Rio Abiseo, to the West, the concession for conservation Alto Huayabamba, to the North West, the conservation area of Leymebamba.

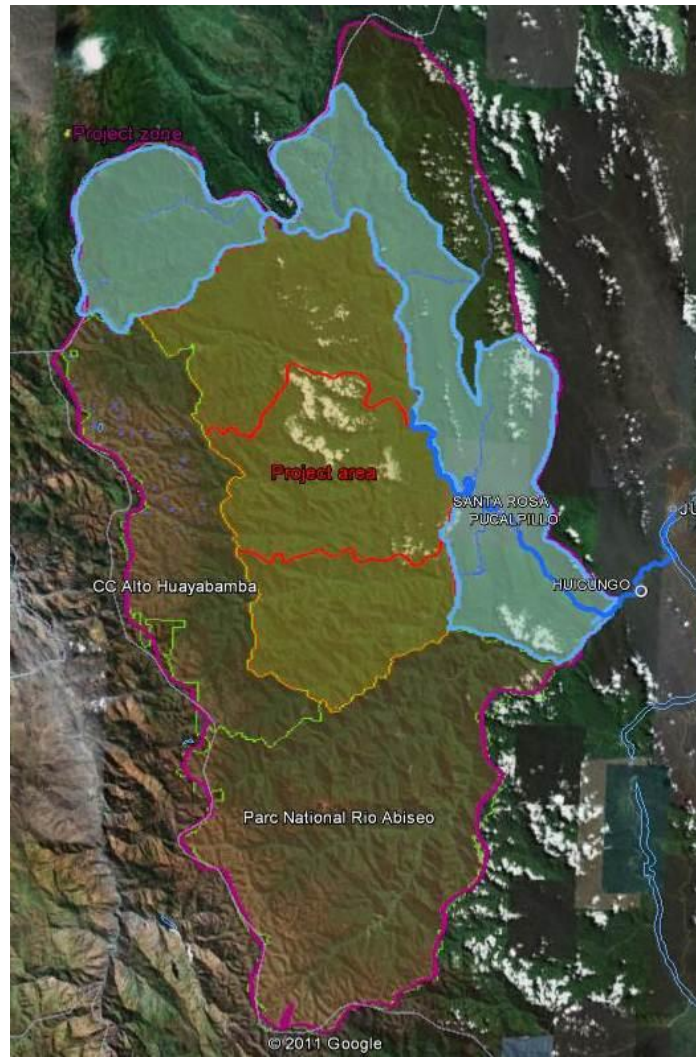
On top of that, accessibility is difficult in the region and it is hard for deforestation agents to move from one place to another (no roads, no paths, accidented relief, etc.).

To the North (Province of Leymebamba, Mendoza area), communities are already settled and have deforested extensively in the past. It is therefore likely that additional deforestation will be low and not directly attributed to the project. To the East (left bank of Huayabamba), most of the area is already leased as forestry concessions. Commercial loggers are therefore already present in the area and additional deforestation is likely not to be attributed to the project activities but part of the baseline scenario really.

Still, to the North, and to the East, the leakage area was selected sufficiently large to encompass all accessible forests around the project areas that could be under pressure during the project's lifetime. The location was selected by taking into account the "cost" that local agents of deforestation need to incur to move their activities as well as accessibility.

Figure 32: Map of leakage area

(In bright blue, the leakage belt)



G3.4. Definition of Project Lifetime and GHG Accounting Period

Project Lifetime

The project's lifetime is 80 years, including the 12 months project preparation period (2010 : Year 1) that involves stakeholder consultations, PRAs, mapping, boundary demarcation, community training and initial livelihood activities, and negotiations with brokers, and buyers.

The first 3 years of the project (i.e. Years 1-3) represent the project establishment period. The goal of this period includes:

- stabilizing project boundaries;
- controlling drivers of deforestation and degradation in the project areas;
- developing community project management institutions;
- building REDD and A/R project development and management capacity;
- regenerating degraded forest lands within the project boundaries;
- Instituting monitoring and measurement systems for carbon accounting, biodiversity, and livelihood generation.

During Years 4-80, the project will move into the maintenance period during which the management will be supported by the project communities, the Amazonia Viva Foundation and local NGOs.

The project lifetime was designed to allow sufficient time to:

- stabilize threatened forest cover;
- restore degraded forests;
- Build enduring community forest management institutions. These encourage livelihoods activities that support the long term conservation of the area.

GHG Accounting Period

The GHG Crediting Period is 40 years (2010-2050) during which net revenues from carbon payments during this period will be used to benefit local communities by enhancing livelihoods and improving the quality of the forest. The project started on January 1 st, 2010 and will end on December 31, 2090.

The Crediting Period was chosen to be shorter than the project's lifetime period to match the duration of the lease of concessions for conservation. Although the concessions for conservation can be renewed for another 40 year after the first period, since future position of local government cannot be predicted ni 40 years time, and since proof of title is mandatory for carbon credits emissions, the project chose conservatively 40 years as the GHG crediting period.

Though the planned life of the project is 80 years, the benefits and the returns from the project will last far beyond the project timeline. Trees are a long-lived species and the forest will endure beyond the 80 years provided management and protection schemes remain in place. Reforestation that takes place within the project timeline will create habitat corridors and refugia needed for threatened and endangered species. If these species are protected within the project timeframe they can be expected to live on past the life of the project. Lastly social bonds, education and lessons learnt will be gained forever in the hearts and minds of the local communities.

G3.5. Identification of Natural and Human-Induced Risks and Mitigation Strategies

Potential risks at the community level include the following:

1. Communities lack of effectiveness to control the Conservation Forest area

The project seeks to sustain the authority of the Amazonia Viva Foundation over the project forests by facilitating its legal status and the formalization of agreements as a condition for project implementation. The project will also bring together a provincial level working group, via the ACOPAGRO and ORO VERDE Cooperatives, APAHUI association and Local Government officials to monitor project implementation. The project seeks to provide special support to local public agencies and governments to build their capacity to partner with project communities in forest protection. The main stakeholders among the public sector institutions, especially at the provincial and district level, lack the logistic means and human capacity needed to meet the challenges of sustainable natural resource management. The project hopes that, by addressing these weaknesses, a coalition of public institutions and community groups can develop and implement longer term natural resource management plans and strategies.

2. Community members experience loss of confidence in the Amazonia Viva Foundation (AMAZONIA VIVA)

The project provides for institutional strengthening of the AMAZONIA VIVA foundation and activities to engage the project communities such as Assisted Natural Regeneration (ANR) and forest protection. Uniforms, identification cards, equipment and financial support for the AMAZONIA VIVA foundation will help formalize forest protection activities and enhance the status of AMAZONIA VIVA foundation members in their communities. These actions will also increase their legitimacy in the eyes of outsiders. There is a risk that increasing status and dominance of the AMAZONIA VIVA foundation members leads to conflicts within the communities due to jealousy or feelings of being left out and not getting direct access to benefits. Regular meetings of the AMAZONIA VIVA foundation and community members are scheduled to discuss management issues and project priorities.

Finally, the project monitors benefits flowing to community members every 3 years to ensure equity in access to employment and development activities. The local Forestry Authorities officers and particularly the ACOPAGRO technicians and agronomists are also involved in providing training and capacity building to community members. They are engaged in monitoring community performance and motivational levels on an ongoing basis throughout the life of the project. The AMAZONIA VIVA foundation is knowledgeable regarding the linkage between carbon revenues and the project activities and grant programs that they fund, as well as the ability of AMAZONIA VIVA foundation to protect and restore forests. As a consequence, a direct financial incentive will be maintained to encourage and motivate participating members and communities to succeed in forest conservation and regeneration efforts.

3. Population growth forces agricultural expansion in project area

It is estimated that the population density will increase from 17 people per square km in 2006 to 28 per square km in 2021 in the San Martin Province. While this is still low, it represents a 60% increase in population over a 15 year period and an annual growth rate of 2.74%.

This value may double or triple depending on immigration rates, however as available forest lands decrease it is anticipated that migration into the province will slow. The project will work with the participating communities to assist them in developing long term resource management plans for their community forests areas as well as other natural resources in the leakage belt under their control. The key is to involve the entire community in a land-use planning process that clearly demarcates conservation

forests, as well as anticipating future agricultural land resource needs based on community priorities. This includes ensuring that forest and land resource management regulations are formulated by the community and sanctions are put in place. The project will guide communities in identifying appropriate areas for future settlement and agricultural expansion while clarifying and demarcating areas for permanent forest conservation.

The project will also actively promote and support agricultural intensification via agro-forestry and agro-ecological practices, rather than further forest clearing. For this, agronomists will be key to provide appropriate training to participants and neighboring community members.

Most families have sufficient land in terms of their labor availability, and consequently the amount of arable land is less of a constraint than the availability of farm inputs and agro-ecological techniques. As a result, increasing yields is likely the best way to enhance food security and farm income.

The project, via the Amazonia Viva Foundation, will also provide communities with extension information on sustainably productive farming systems and provide small grants to innovative local farmers willing to conduct innovative cropping trials.

4. Loss of carbon stocks through fire, illegal felling, and land clearing

This project proposes to reduce risk of carbon leakage from land clearing, illegal felling and fire by building strong partnerships between the Amazonia Viva Foundation, the communities' members, the cooperatives and local NGOs at the field and provincial level. Pur Projet will seek as well the support of national and international organizations to fund and lobby for the promotion of the project.

Illegal logging risks will be mitigated through a number of measures including demarcating boundaries and posting signage, blocking of tractor access through trenching and other methods, regular patrolling, development of a network of patrol huts and fire roads to facilitate rapid movement, rapid response and confiscation of chainsaws and other equipment, and improved communications with FA through two-way radios and cell phones.

Land encroachment will be addressed in three ways. First the AMAZONIA VIVA Foundation will take responsibility for meeting with new migrant and neighbouring communities and leaders, as well as local government to clarify the boundaries of the project area, resolve any existing conflicts, and emphasize the intention of the AMAZONIA VIVA Foundation to secure the area. Communities will be encouraged to inform prospective migrants that the forests are protected and that there are no opportunities for new migrants to the area.

Second, the AMAZONIA VIVA Foundation will demarcate boundaries with pillars and signage, maintain regular patrols, and call in the support of the local FA, police and military as needed. These actions will be coordinated with commune chiefs and district governors. Third, villagers who established in-holdings within the CF areas prior to the project will be asked to sign contractual agreements with the AMAZONIA VIVA Foundation that will allow them to continue farming provided that they do not expand further into the forest area. They will also be forbidden to sell their in-holdings to any outside person.

5. Insufficient Funding or Inappropriate Use of the Revenues

Project planning and implementation costs are funded through Pur Projet own's funds and sales of environmental services initially, and the on-going carbon sales income then. These costs have been estimated and budgeted for the life of the project (at 26.7 million Euros, without distribution costs) and in the initial years the ability for carbon to pay for project costs is based on estimates of potential net carbon income. Depending on the price of carbon and payment schedule for carbon payments, this cash flow

may need to be augmented with additional grants in the early years of the project. Once the project is validated, any potential funding gap can be identified and additional funding sources can be secured.

The project is developing a mechanism for the allocation of income from the sale of carbon credits, after project costs and management costs for the project are covered, that will be acceptable to participating communities, the Amazonia Viva Foundation, the provincial government and to Pur Projet. The goal of allocation will be to direct income from carbon credits to benefit participating communities, restore the health of forests and develop new REDD projects in Peru after project development and management costs are covered.

It is proposed that the carbon revenues be managed by Pur Projet and AMAZONIA VIVA foundation for operations management and expenses reporting, with allocations made annually for project implementation costs based on the approved annual work plans. Any net revenues generated after project costs and management costs for the project are covered would be placed initially in a project grant fund administered by the AMAZONIA VIVA foundation.

Net carbon revenues may be then channelled into the AMAZONIA VIVA foundation account that will support livelihood activities for project communities, as well as finance the development of new REDD and A/R projects. The allocation plan will also assess how community carbon payment funds are managed in terms of technical support, institutional capacity building, reinvestment in forest restoration and economically productive forest enterprises, etc. Annual audits on project funds will be completed at the end of each year.

It is estimated that from the total budget of 26.7 million euros of the project (without distribution costs), at least 17 to 18 million will be directly invested or spent via the AMAZONIA VIVA foundation to the participating communities, equivalent to 63 % to 67 % of total budget directly invested in project activities for the beneficiaries.

G3.6. Measures to Ensure the Maintenance or Enhancement of High Conservation Values consistent with precautionary principle

Inventories of biodiversity have been conducted in the past at different level, the San Martin province level, but as well more in detail in the project area, for the concession El Breo (see section G1). It means there is good knowledge of biodiversity and high conservation value in the project area, with already identified conservation targets, distribution patterns, and activities to preserve this value. Still, inventory is not 100% complete yet and extended to the whole project area.

However, in accordance with the precautionary principle, this lack of complete scientific data is not postponing the implementation of activities to preserve the area. As it can be seen in the overall chronogram, all types of conservation activities (see section G3.2) will be started and implemented, alongside the completion of more detailed inventories and studies of the biodiversity.

For the assisted natural regeneration of forest resources, priority will be given to areas that are natural habitats for rare or threatened species. Enrichment planting will occur with unique endemic species. For the monitoring of biodiversity, unique habitat areas and species of exceptional importance for conservation will be identified so that project activities can focus on them.

The project seeks to ensure the maintenance of the cultural High Conservation Values (HCV) areas by supporting traditionally forest-dependent lifestyles through (1) clarifying the land-tenure and stewardship of the local communities over the forest they have been living in for centuries, and (2) by supporting the community's livelihoods through the various measures that are being financed from the carbon credits.

G3.7. Description of Measures that Will Be Taken to Maintain and Enhance Benefits beyond Project Lifetime

The project plans several activities to permanently enhance and support the incomes of project households. Example of such activities include supporting the sustainable harvesting, production and marketing of non-timber forest products including seeds, medicinal plants,... Through the micro-finance mechanisms and small grants supported by the project, small enterprises can be developed and farmers can enhance their production and yields without the on-going need for funding.

The education, training, empowerment of the communities provided within the project is a key investment in the social capability of the communities to pursue the activities beyond project lifetime. The success of the project on the long run will be driven in a large part by the appropriation of the project by the communities.

A proportion of the funds will be used to develop other carbon projects within the neighbouring communities and to a larger extent, in the San Martin Province. As a consequence, this project can serve as a catalyst for other forest conservation and poverty reduction projects.

G3.8. Involvement of Communities in Project Design and Provisions for Stakeholder Consultation During Project Implementation

Identification and Organization of Stakeholders and Communities Affected by the Project

The main stakeholders are the owner of the concessions constituting the project area: ACOPAGRO cooperative, Asociacion Dos De Mayo, and APAHUI association, as well as two other main communities (Santa Rosa and Pucalpilllo), also willing to ask for large concessions for conservation in the same zone, and heavily involved in the project since the beginning. These 5 main stakeholder were selected due to the concessions they had or they wanted to ask on large forest areas in the Huayabamba river, in the biological corridor between National Park Rio Abiseo and Bosque de Proteccion Alto Mayo, because of their commitment to for protection of the forests and their awareness about environmental issues, and their capacity to form an organization towering the project (Amazonia Viva). They has also been involved (ACOPAGRO in the first place) in the development and success of a reforestation program started in 2008 in the same region.

The Amazonia Viva Foundation was founded by these 5 stakeholders (plus the cooperative ORO VERDE, involved in another reforestation program in San Martin province), in order to coordinate actions for conservation and reforestation in the province, and more specifically to coordinate locally the Biocorridor Martin Sagrado REDD project. The Foundation is today constituted by the 6 members, with elected representatives at the board, and managed by a General Manager and a team of engineers and technicians. The members of the foundation will meet at least quarterly to review progress and take decisions.

The other stakeholders are all the forest dependent communities in the project zone (Huayabamba river basin). These communities have expressed their desire to support and comply with the carbon project management plans in return for technical and financial support to build their stewardship capacity and local economy. The communities along the Huayabamba river have been involved in the previous reforestation program developed by Pur Projet and ACOPAGRO and have been identified and consuted through this channel on the REDD project. Communities in the northern part of the project zone have been identified by Amazonia Viva Foundation a bit later on, and consulted and included in project design through various onsite visits to the communities (Chuquibamba, Leymebamba)

Other stakeholders in the REDD project include the provincial and district governments, commune chiefs and councils, NGOs and civil society groups, and the national and local Forestry Administration. All of them have been consulted by Pur Projet and Amazonia Viva Foundation, and implicated to a lesser extent in the feasibility and design of the project. Pur Projet has a long history of presence in the province and zone, through the development of reforestation projects, and has build strong relationships with all stakeholders in the area.

Involvement of Communities in Project Design

A series of meetings was organized to involve the identified stakeholders in the project design process. This series of meetings coincided with field sampling and social appraisals. The meetings had high levels of community participation to the Amazonia Viva Foundation activities, and therefore helped to ensure that decision making is done transparently and through the consensus of group members. Given high levels of illiteracy in project communities and the complexities



of carbon project modalities, the project development team communicated and shared project concepts with communities through a series of village meetings.



In July 2010, contracts were signed between ACOPAGRO Cooperative and Pur Projet to start the operational activities, organize additional meetings with all project neighbouring communities, to discuss the procedures and modalities of the REDD project including introducing the concept, benefits and risks, as well as exploring the current situation and existing problems that communities are facing. This information has been used to formulate contractual agreements with local communities covering project participation, as well as in designing the annual work plans for technical and financial assistance.

The following sections contain a summary of the input of each of the stakeholder

a) Specific Inputs from Participating Communities (including Dos de Mayo)

The project developers and AMAZONIA VIVA Foundation members met with communities to ask their opinion and get input on the project design, key problems, and other development priorities. For the most part, the problems and needs mentioned by the different communities were very similar, as were their requests for support.

A number of communities wanted to improve walkways and build more patrol posts. Communities also requested employment opportunities to be built into the project design, and that the majority of funds actually go to them.

Communities have requested legal support to address encroachment by more powerful stakeholders and economic land concessionaires. The AMAZONIA VIVA Foundation shall organize a series of meetings in 2011 and 2012 to inform other stakeholders of the project's goals and request that they respect the boundaries of the project area.

The communities also mentioned they would like to restore their forests and would like to regenerate native and medicinal species. Most of these species have multiple uses and are endangered or threatened species. In addition, villagers would like to enrich plant species that are valuable, including frutal species.

Some leaders reported that while initially community members were reluctant to confront migrant encroachers, as they have become better organized they are actively confronting individuals engaged in illegal forest activities. The community members have requested more of the following to strengthen protection: budget to better the walkways, patrol posts, legal recognition from the Forestry Administration for sites that are not yet approved, boundary posts, walking paths around boundary, two-way radios, some salary subsidies for patrols, and uniforms. In addition, the communities would like to receive some livelihood development support including training on cocoa and coffee cultivation, seeds collection and other non timber revenues. The villages also expressed a need for improved access to schools.

These communities' inputs have been key in the design of the project to support activities which will directly build their capacity to protect forests, while generating employment and income to local communities. Special initiatives funded under the project will reflect community priorities including walkways improvement and development, livelihood training and micro-financing, agricultural intensification, and related needs.

b) Specific Inputs from ACOPAGRO Cooperative.

Another main stakeholder is the organic and fair trade cooperative ACOPAGRO. The Cooperative is key to the project, as it was implicated since the beginning in the design of the project. Moreover, it has been developing since 2008 with Pur Projet a reforestation program in the same region with the same communities, and has therefore a strong legitimacy among farmers on environmental programs. On top of that, it is a famous cocoa cooperative in the whole province of San Martin and even outside the province, with a strong legitimacy and image. It is therefore helpful as primary member of Amazonia Viva foundation, to make the link and ensure smooth communication between Pur Projet and the participating communities.

On a technical point of view, ACOPAGRO's extensive experience in the development of agro-forestry organic agriculture and natural productivity intensification will be key as well to give training to the communities. Moreover, the Cooperative will be in capacity to setup and manage the supply chains and ensure distribution of non-timber products like seeds, medicinal plants extracts, honey, etc... ACOPAGRO will also be in charge as well of developing micro-credit activities.

ACOPAGRO will provide training to the communities on:

- improved agro-forestry practices, agro-ecological practices, forest protection, boundary demarcation,
- patrolling support including uniforms, huts, and communication equipment;
- Assisted Natural Regeneration activities;
- Small enterprise training and micro-finance development.

c) Specific Inputs from APAHUI organization.

APAHUI is a strong organization of cocoa producers created recently before the project start with 80 farmers, but with a strong motivation and goal to become a complete cooperative with higher volumes of production.

They decided to join the REDD project in 2011, with the goal of joining their "Municipal Area for Conservation Huicungo" to the 2 others concessions for conservation, and formalize the land tenure of this area by asking for a concession for conservation for an area of 80 000 has from this municipal conservation area. The project expanded from 236 000 has to 316 000 has at their initiative.

d) Specific Inputs from Local Government.

At the origination of the project, Local Government representatives mentioned that they have no funding to dedicate to meetings to discuss community forestry management issues at the provincial, district, or municipality level. They even requested funding from the project to allow provincial and district officials to travel to community forests areas, as well to meetings with stakeholders to resolve forest conflicts.

Local Forest Administration (INRENA) staff comment that they have limited resources with which to provide extension and custodial support to the community forests groups. They have requested project support to cover travel expenses to the forest areas including, transportation, gas and maintenance, and per diem for accommodation and food.

The stakeholder meetings with Forestry Administration, Local Government, and civil society organizations generated a range of comments that were discussed, explored and integrated into the project strategy and work plan. Community comments, as well as those of other stakeholders provide the basis for formulating activities.

This includes:

- improved forest protection through walkways improvement, boundary demarcation, patrolling support including uniforms, huts, and communication equipment;
- employment for Assisted Natural Regeneration activities;
- small grants for agro-forestry development;
- enhanced livelihoods through small enterprise training and micro-finance institution development.

Later after project initiation, local government developed the “Mesa REDD San Martin”, workgroup and exchange platform dedicated to the elaboration of the baseline scenario for REDD readiness of San Martin region in Peru. The roundtable involves technical consultants, representatives from regional and national government, representatives from the different conservation initiatives in the region, representatives of native communities, etc. Pur Projet and Amazonia Viva are part of the roundtable. So far the roundtable has been a platform to exchange on drivers and agents of deforestation, historical deforestation rates, future threats, etc. These elements were integrated to the project design.

Provisions for On-going Stakeholder Consultation during Project Implementation

The project ensures regular community feedback through discussions between the AMAZONIA VIVA Foundation and the implementing communities, and Pur Projet. The Amazonia Viva Foundation will meet quarterly to review experience and best practices to identify innovations for extension. These practices will receive special attention for inclusion in the coming year’s work plan. AMAZONIA VIVA Foundation will also organize quarterly broader assemblies where all community members will be able to participate to give their feedback on the project. Given the lack of accessibility of some communities, AMAZONIA VIVA Foundation staff will also conduct regular field visits to all communities involved to collect their feedback. The AMAZONIA VIVA Foundation will play an active role in distributing key project documents to affected community members and key stakeholders as well as publicizing community events/meetings.

In addition, monitoring of socio-economic and environmental impacts will be conducted on a continuous basis, through the use of surveys (see questionnaire in appendix). A sample of farmers in the participating communities will be surveyed every 2 years to monitor the impact of conservation activities and collect their feedback on the project.

Periodic focus group discussions will be used to document how key activities are progressing and identify problems and issues. Case studies will be written by project staff and consultants to ensure lessons are captured.

Quarterly meetings of the provincial working group and the AMAZONIA VIVA Foundation will be used to inform local government representatives regarding project achievements and experiences.

Project documents and biodiversity and community monitoring data will be collected and processed by Pur Projet, and put at disposal of the communities and the cooperatives.

Annual work plans and budgets are developed each year based on feedback from the previous year’s operations. The goal of this annual review by the AMAZONIA VIVA Foundation is to enhance the impact of project resources on carbon storage and sequestration, as well as livelihood and biodiversity goals. While an overall budget and strategic plan is provided in the Project Development Document (PDD) and related documents, the AMAZONIA VIVA Foundation together with project implementing organizations and community participants will have the flexibility to modify their annual strategies and budgets based on experiences from the previous years and emerging development priorities.

G3.9. Procedure to publicize Public Comment Period

Parallel to the publishing of the English-version of the PDD on CCBA website, a simplified spanish-version of the document will also posted on ACOPAGRO and Pur Projet's websites for the 30-day public comment period.

A printed version of the document will be distributed in the participating communities for free consultation.

In addition, Amazonia Viva will also organize a series of community sessions to present the document. All Spanish comments will be centralized by one person within the AMAZONIA VIVA Foundation, and translated into English, and sent to Pur Projet before the end of the public comment period. Pur Projet will then submit the comments from local communities and other stakeholders to the annex of this PDD.

G3.10. Process for Handling Unresolved Conflicts

The project relies on existing and emerging institutions to mediate any conflict arising from project related activities. The AMAZONIA VIVA Foundation, ACOPAGRO, and APAHUI are the focal point in the community for preparing annual work plans and ensuring a transparent and participatory process among members. Since the AMAZONIA VIVA Foundation has close interaction with the ACOPAGRO staff, and receives support from them, this process allows a consensus plan to emerge that minimizes the chance for conflict. Leading up to the start of project implementation, the project team will meet with all AMAZONIA VIVA Foundation members to receive their input into the first year work plan.

Conflicts that may arise during the course of project implementation will be presented and solved at quarterly AMAZONIA VIVA meetings. Conflicts that cannot be solved at the level of the AMAZONIA VIVA Foundation groups will be mediated by a mutually agreed upon, neutral third party. ACOPAGRO in the first place, then local NGOs and the Forestry Administration will attempt to resolve conflicts raised based on the Forestry Laws, and the Community Forestry Agreements, and will provide a written response to grievances by the next monthly meeting. Project conflicts and their associated responses will be documented.

G3.11. Demonstration that Financial Mechanisms are Adequate for Project Implementation

Up-front project funding for the project has been provided through the investment of Pur Projet's own funds in the first place.

In the first years, sales of environmental services (certificates of hectares preserved) and in smaller proportions of ex-ante carbon credits permitted to cover all start-up costs as well as the cost of validation of methodology and Project Documents for the CCBA. Such funding will continue throughout the project lifetime.

However, most funding will come from the sales of VCUs generated by the project after VCS validation and verification of the project (2013). Estimated net carbon revenues (net of commercialization costs) from the project, totaling up to 50 million euros over 40 years, is expected to exceed all project-related costs (evaluated today at 26 million euros) as well as all on-going carbon monitoring costs. Detailed 80-year financial projections have been developed for the project, and will be made available to the Validator upon request. Main categories of expenses are presented in the section G.3.2 of the present PDD.

G4. Management Capacity and Best Practices

G4.1. Identification and Roles of Project Proponents

The specific roles of each of the project partners are outlined in table 38.

TABLE 38
Role of each of the project partners

Pur Projet	<p>Pur Projet is the project developer, at the initiative of the REDD+ project. Pur Projet has been present in San Martin region and in the project zone since 2008, starting with the development of community reforestation programs. Pur Projet designed and started the REDD+ project in 2010, is responsible for the general coordination of the project, and in charge of the commercialization of the carbon credits issued by the project.</p>
Fundación Amazonia Viva	<p>The Amazonia Viva Foundation is the main local implementing organization Foundation created at Pur Projet's initiative, in order to coordinate and support reforestation and conservation activities in the San Martin region. The foundation gathers ACOPAGRO and ORO VERDE cooperatives, and 4 local community associations: APAHUI, Asociacion de Proteccion de Bosques Comunales Dos de Mayo, APAP (Asociacion de Productores Agroforestales Pucallpillo), APAPMASAR (Asociacion de Productores Agropecuarios y Protectores del Medio Ambiente Santa Rosa).</p> <p>The foundation members have been implicated in Project design and implementation since the beginning. The constitution and formalization of the foundation came up in 2011 after the beginning of the first project activities, in order to facilitate and optimize local management of the project.</p> <p>Within the scope of REDD+ project, the foundation assists Pur Projet with coordination of project actions, including implementation, management and monitoring of the project. Participates in project design. Facilitation between various stakeholders, ensuring accountability, transparency in use of revenues, and good governance. Support with training of local communities, stakeholder consultation and integration. Designing and conducting social appraisals, and support with conducting forest inventories. Support forest protection and enforcement, capacity building for local communities, stakeholder consultation and conducting forest inventories. Daily administration of all project activities.</p>
Other participating communities (in project area and in project zone)	<p>List of communities in section G.1.5. All participating communities were included in the project design and the decision process and the choice of activities. The communities are responsible for the implementation and monitoring of project activities in the field. The project includes empowerment of these communities.</p>
ONFI	<p>Technical partner assisting in carbon calculations, development of Project Design Documents, creation of management system to gather monitoring data, design of forest stocks inventory plan.</p>

Reforesta Peru	Project partner for forestry expertise and seedlings sourcing for reforestation activities. Growth of seedlings monitored by agronomists and engineers dedicated to reforestation and agroforestry as part of project activities. Trainings on forestry aspects and forests management.
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Each year the implementing organization will prepare an annual project report to be approved by the communities and Pur Projet. Every six months meetings will be held to allow project managers to report to the ACOPAGRO management regarding progress, needs, and achievements. At the field level, the implementing organization will oversee the daily administration and monitoring of the REDD project activities in cooperation with the implementing partners allowing coordination with local government and technical agencies.

G4.2. Identification of key skills and Experience of Management Team

Members of the Amazonia Viva Foundation, as the implementing organizations and the implementing partners have extensive experience in designing and implementing community development projects in rural areas, as well as practical and technical field knowledge. The foundation is managed by Roldan Rojas Paredes, who ran a few times the municipals and was a counselor of Acopagro in cooperativism. He has a large experience and knowledge of the region, its communities and the various stakeholders. The Amazonia Viva Foundation management team also includes a agronomist engineer with previous extensive experience in community reforestation project, an economist with strong experience of relationship with local authorities, legal issues, and community management. Acopagro cooperative also has experienced agronomists, forestry and community specialist, as well as many filed technicians who have a strong knowledge of the communities.

In addition, the project will be supported by the **local Forestry Administration** staff that will provide technical and custodial support to local Amazonia Viva Foundation.

Pur Projet, a private organization based in Paris, France, and specializing in the development and marketing of community forest carbon credits has supported the development of all carbon market preparatory work and will ensure that buyer-seller negotiations are conducted in an efficient manner and that carbon measurement and submission to registries are successfully completed. Pur Projet will complete the project design document and facilitate negotiations between the communities and the foundation to ensure a smooth transition as field activities are initiated.

Pur Projet has a portfolio of 8 other afforestation/ reforestation projects in tropical countries (Indonesia, Ghana, Thailand (4), Honduras, Peru) developing agroforestry and afforestation with small-scale farmers (cocoa, rice, coffee), 3 REDD+ projects (Peru, Brasil) with native communities, and 5 additional plantation projects (Philippines, Morocco, South Africa, Brasil). Pur Projet is at the initiative of the creation of Amazonia Viva consortium.

12 years experience of Pur Projet's founders (Tristan Lecomte, Alexis Kryceve, Mathieu Senard, Edouard Rollet, Ilse Keijzer) in grass roots development projects through their experience at Alter Eco (they co-founded Alter Eco in 1998, leading Fair Trade company in France). They developed long term partnerships and development projects (combining Fair Trade and Organic) with over 60 cooperatives of small-scale farmers in more than 40 countries. More references available at validators request.

Reforesta Peru is a Peruvian tree nursery company with heavy expertise in forestry and combination of forestry with agriculture (forestry and agronomists experienced engineers). Reforesta Peru has been involved in reforestation projects with the same communities with Acopagro for the last 4 years, and has extensive knowledge on the local forest characteristics, tree species, combination with agricultural systems, markets for timber, etc.

G4.3. Plan to Provide Orientation and Training to the Project's Employees

A substantial amount of training will be provided to the project's employees and participants. Depending on the needs for the project, these will include training in forest inventories, biodiversity assessments, silvicultural management for risks in mitigation, or silvicultural management for assisting natural regeneration. The training for these jobs will be organized by the Amazonia Viva Foundation, Pur Projet, and other requested organizations, such as the organization who will conduct the biodiversity monitoring.

In addition, a key component of the project is to have local community members teaching and learning from each other. Groups that have worked with the local communities in the past will select local community members to be trained. Special attention will be given to gather a wide range of people from within the communities and especially from underrepresented groups.

G4.4. Equal Opportunity of Local Community Members for Employment

We believe strongly that local employment is a key component in the project. Local community members are more knowledgeable about the local flora, fauna, conditions, geography, weather and culture than most experienced outsiders. In addition, employing local community members not only will create significant direct and indirect job opportunities over a 40 year period, but facilitates a stronger connection to the land and forest resources. The training and employment directly offered and created by the project will support the creation of a lifestyle that emphasizes sustainable forest protection and forest stock enhancement.

Jobs related to project implementation range from improving the walkways, conducting forest inventories, developing and managing non-timber forest activities (botanical garden, seeds extraction, ecotourism...), forest patrolling, to managing microfinance, and thus require a range of skill-sets. Though all community members are given an equal opportunity to apply for employment, the ultimate decision is up to the local groups mentioned above based on the abilities of the individual. As local community members train each other, become more self-sufficient, and knowledgeable of their trade they will move into upper management. The project proponents will investigate if specific community groups are underrepresented. Project proponent will organize training sessions targeting underrepresented community groups to ensure the inclusion of such groups into employment activities.

Special attention will go to gender equality and the participation of women in capacity building and employment activities.

G4.4. Compliance with Regulations Covering Worker Rights and Plan to Communicate Regulations

The project will meet or exceed all applicable national labor laws and regulations covering worker rights. Compliance will be achieved by the explicit approval of the annual work plans designed by the Amazonia Viva Foundation and Pur Projet. This will ensure that actions are consistent with the national legal framework. The project managers will inform workers of their employment rights during community

meetings. Documents explaining national rules on worker's rights and the obligations of both contracting parties will be made available in local languages when relevant.

G4.5. Assessment of Risk to Worker's Safety and Plan to Communicate and Minimize Risks

In the field work, the main risks for the safety of workers include falling trees in thinning operations, accidents using cutting tools, and snake bites. Falling trees are less of a problem as most of the thinning operations involve very small diameter shoots.

Safety guidelines will be formulated to address risks that endanger worker health. The Amazonia Viva foundation workgroups involved with thinning will be trained in safety techniques. The Project Implementation team will review worker risks and mitigation strategies annually to ensure risks are minimized. Often disadvantaged groups become associated with jobs of greater health risk. Special attention will be given to make sure that AMAZONIA VIVA foundation workgroups will be from diverse backgrounds and that knowledge of any risk associated with project employment is understood by all means possible.

G4.6. Financial Health of Implementing Organization

The project is being jointly implemented by Pur Projet and the Amazonia Viva Foundation, whose main members are Acopagro and Oro Verde cooperatives.

Pur Projet is a private organization, based in Paris and attracts donor funding and carbon finance funds. Currently, Pur Projet implements over 10 carbon offset and community forestry projects in 8 countries, with offices in France and the US, using multi-dimensional approaches to enhance the capacity of individuals, organizations, networks, and communities to deliver environmental services and fair trade and organic products, and increase learning in four key sectors: fight against climate change, community-based natural resource management; improving livelihoods; civil society awareness on sustainability. These programs generally entail institutional strengthening, technical assistance and training for national and grassroots organizations, as well as management of grant funds on behalf of donors and the private sector.

As of December 2010, Pur Projet had a million euros in cash as treasury, activity is cash flow positive, clients paying in advance for the services rendered, so the financial situation of the company is very strong in terms of cash flow and Pure Project has all callable funds to cover projects needs until break-even point and beyond.

Pur Projet is fully self funded since its start, by a large portfolio of clients (more than 70), among others multinationals like Nestle, Procter and Gamble, Unilever, Vinci, Chanel, Clarins, Carrefour,.. These clients are committed for 2 to 3 years commitment plans, which give good visibility on expected sales for the coming years and secure projects and activities. Pur Projet has already more than 800 00 euros of future expected revenues for 2012 by these clients.

Pur Projet is a fast growing and profitable company with provisions and financial reserves built up precisely to be able to meet an eventual default in the project. Fixed costs are very limited, and the direct approach to the projects allows getting good margin levels.

Pur Projet develops projects directly sold to clients, and this absence of intermediaries allows a good strategic positioning on the market, with competitive prices for clients, significant returns for farmers and good margin levels for Pure Project.

Pur Projet has no debt and is fully self-funded by carbon sales.

Since its start in 2008, Pur Projet has been profitable and its turnover grew by 100 % between 2009 and 2010, from 500 K Euros in 2009 to 1 million euros in 2010. In 2011, sales growth follows same pattern, with an expected 1.5 million euros turnover. Pur Projet is profitable since its start, and is recording a sharp increase in its profitability, raising from 8 Keuros in 2009, to 140 Keuros in 2010 and an expected 250 Keuros net result in 2011. With volumes of sales of carbon credits growing, the company can only gain in profitability, economies of scale permitting to lower fixed costs (like project framework development costs, validation, follow-up).

Moreover, Pur Projet has a strict policy in provision making for future risks. As financial accounts show, the company had already provisioned more than 250 Keuros in provisions for risks as of end of 2010, and will record a total of 450 Keuros by the end of 2011.

On the whole, the Pur Projet has a very cautious financial management policy and reinvests 100 % of net result in reserves as a company policy. Objective is to grow the financial reserves of the company, to secure partnerships and projects and leverage with other external financial partners to build up projects and duplicate them.

ACOPAGRO is an agricultural cooperative with over 10 years experience in the export of cocoa and 2000 active members. The organization is FLO and Organic certified (standards EU et NOP) and is very successful, both on its commercial activities (ACOPAGRO has become in ten years Peru's first cocoa exporter) as well as towards its compliance to fair trade principles. ACOPAGRO can be considered as a model organization and has been certified under Alter Eco Gold Standards in 2009 by SGS.

Its mission is to build empowered communities that give people an opportunity for a better life. ACOPAGRO does this by strengthening the capacity of farmers to be good products providers. ACOPAGRO represents its stakeholders, network with others for learning and knowledge sharing, and advocate for social, economic and environmental justice. Interdependence, responsible stewardship, inclusion of vulnerable groups, and respect for local ownership and knowledge are core values across all of the programs both of Pur Projet and ACOPAGRO.



G5. Legal Status and Property Rights

G5.1. List of Relevant Laws and Assurance of Compliance

The proposed project activities are all within the existing legal framework of the Government of Peru. Project forest management activities will be approved by the Forestry Administration (INRENA) on an annual basis, ensuring that actions are consistent with the national legal framework. The project complies with all national and local laws and regulations and international treaties and agreements.

The project proponents hereby assure that the project has and will comply with all the regulations. The extensive stakeholder consultation process will ensure that compliance is achieved.

G5.2. Document that the project has approval from the appropriate authorities, including the established formal and/or traditional authorities customarily required by the communities.

Pur Projet and the Amazonia Viva Foundation are members of the regional Mesa Redd San Martin, as REDD project developer in the San Martin Region recognized by the regional government. Pur Projet has been active for 4 years in San Martin Region with reforestation programs, and has the support and approval of the regional government for the Reforestation and REDD programs developed in the region.

G5.3. Demonstrate that the project will not encroach uninvited on private property, community property, or government property

The project will not encroach uninvited on private property, community property, or any other government property, as the project area was before an unused area owned by the government. The cooperative ACOPAGRO, the Dos de Mayo and APAHUI Associations have or are in the process of obtaining concessions for conservation purposes from regional government, for the Project area of 313 687 hectares.

Although they don't legally have any rights on the land, the communities living inside the project area (Canaan, La Morada, Anazco Pueblo) were consulted and gave their free prior informed consent for the project (documents available on demand).

G5.4. Demonstrate that the project does not require the involuntary relocation of people or of the activities important for the livelihoods and culture of the communities

The project activities will not involve the resettlement of any communities or households, since project goals include stopping settlements before they happen. Resettlement is not a component of the project design nor would it be acceptable, their participation in land-use planning is essential.

None of the project activities requires any relocation, voluntary or involuntary. However, due to the high pressure from migration into the San Martin Province, the project must be ready to respond to pressure from future migrants to encroach in the area. The project team is already conducting diagnostic studies to better understand in-migration patterns and drivers in the project area. The project team will organize a regular dialogue between the project communities and migrant communities in each area to develop natural resource management plans, as well as guidelines and regulations covering land-use allocation. Project benefits will also target local migrant communities where feasible, to ensure incentives are in place to stabilize and guide land-use and land-use change in the project area and leakage belt.

The formulation of clear land use plans with large format maps posted in public places will clarify tenure status for land in the project area. This will enable to explain new land and forest policies to migrants

visiting the area. As the tenure situation is publicly and transparently clarified, word-of-mouth communications will inform prospective migrants and slow migration rates into the area.

G5.4. Identification and Mitigation of Illegal Activities

This project is designed to combat all illegal activities within the project boundary. The most common illegal activities are illegal logging, fires, and agricultural encroachment.

Cooperation between local communities, police, and Forestry Administration staff and the distribution of equipment to aid in patrols should be able to reduce 90% of deforestation associated with illegal logging. Frequent patrols will eventually dissuade illegal loggers from continuing their operations in the project area.

Intentional fires are used to “clean the land” and are often started by hunters to attract game to new shoots to feed. The clearing of land by fire severely harms the forest ecosystem and often is the first step toward agriculture encroachment. Intensified agriculture will help mitigate agriculture encroachment in forested areas. Local farmers will be trained to improve efficiency and give priority to permanent cultures (like coffee and cocoa) instead of moving to new land.

G5.6. Demonstration of Land Tenure Status and Title to Carbon Rights

The Asociacion Dos de Mayo, ACOPAGRO, and APAHUI possess or are in the process of getting the legal concessions for conservation attributed by the government, which ensure the explicit and uncontested legal tenure to the local communities as well as the land management and carbon rights.

An agreement signed between concessionaires (Asociacion Dos de Mayo, ACOPAGRO, APAHUI), Amazonia Viva Foundation and Pur Projet stipulates that the concessionaires, owner of the carbon rights, transfer the carbon credits to Pur Projet for distribution along the project development.

G6. Adaptive Management for Sustainability

G6.1. Design of management actions and monitoring programs

The project will use different sources to periodically collect reliable information as a technical support tool for decision making, to facilitate the adaptive management of the project.

The ACOPAGRO cooperative provides its own social monitoring. The efforts in the social area will be controlled through annual surveys, that will be directly conducted with the communities, in order to have continuous feedback evaluation.

The monitoring program will be performed by comparing the data raised periodically and the initial conditions of the Martin Sagrado project, which will be mapped and identified in the annual project report, through satellite images and field studies.

The land use area monitoring will be done with remote sensing methods, using images of medium resolution, generated in partnership with Planete Action. Associated with this, the monitoring program aims to involve the communities in mapping the threatened areas, identifying the risks and threats to which these areas are subjected. The large scale monitoring will be done through satellite images made available by Spot Image.

There is also a special monitoring report in order to ensure that the efforts of biodiversity conservation and sustainable use of the natural resources are being effective. The information is collected with a form that

covers different key themes for evaluation, and completed by technicians connected directly (local team) or indirectly (institutional managers and co-managers) to the Martin Sagrado project implementation.

All of this reliable data that is collected and documented will be used as a technical support tool for decision making in order to improve project outcomes, and to adapt the project according to the actual needs and reality. These decisions will be made during the annual CFMC meeting to review the Activity Plan. On these occasions, the design of the monitoring plan will be analyzed according to its efficiency in generating reliable feedback and all the necessary information. Plan or management actions are identified, a corrective action will be designed and, if needed, discussed with the CFMC.

G6.2. Management plan for documenting decisions, actions and outcomes and for sharing this information with others within the project team

In order to avoid the loss of information, ACOPAGRO and Pur Projet will adopt a project implementation process in which annual reports will be prepared by every monitoring program and any corrective actions (i.e., to resolve conflicts or apply suggestions) taken by the team will be documented immediately following the execution. Every member of the project will be aware of how to document the actions taken in the project and how to forward it to the project coordinator, who will keep track of this information and use it when necessary.

All these documents can be consulted at any time by anyone, if necessary. The most relevant information will be released to everyone involved in the project implementation during the project meetings or by mail.

G6.3. Flexibility of the project design to accommodate potential changes

The project adopts an adaptive management approach that is a structured and interactive process for decision making in the face of uncertainty. The objective is to reduce uncertainty over time through systematic monitoring. This system is useful in the definition of the operational objectives that serve to measure the project success, the effectiveness of the extension work and the project's contribution to positive change. The system allows lessons learned to be integrated into the project and into the manner in which the management team operates. The improvement in the quality of the project will be obtained using an adaptive management approach.

ACOPAGRO's experience in implementing a System of Monitoring Information for Fair Trade, Organic and reforestation activities will be very useful.

G6.4. Early commitment to the long-term sustainability of project benefits once initial project funding expires

Through a mechanism of payments for environmental services, the project seeks to provide value for forest conservation. Considering that the project aims at preventing emissions of at least 20 million tons of CO₂ into the atmosphere over 40 years, and more than 6,8 million tons of CO₂ over the first 10 years, there is a considerable potential for long-term project sustainability. Based on the current contract signed by ACOPAGRO and Pur Projet, Pur Projet will purchase the REDD credits generated by the Martin Sagrado Project at a price not less than US\$ 1 per ton of CO₂. Therefore, considering only the minimum price of US\$ 1, the Martin Sagrado project is expected to generate more than US\$ 6,8 million in the first 10 years; and more than US\$ 20 million by 2050 through the sale of REDD carbon credits generated in the crediting areas. The base price for the initial carbon credits will be negotiated, to guarantee the financial sustainability that the project requires to achieve its environmental and social objectives.

It is worth noting that the expected resources from the REDD financial mechanism have not yet been generated; the investor partners involved in the implementation of the Martin Sagrado project, through partnerships with Pur Projet, will guarantee the financial support necessary for the effective implementation of the project's planned activities related to forest conservation and sustainable development.

The initial invested fund will be partially used for community capacity building to generate income through sustainable business. Ecological activities already performed by community members will be amplified and improved in quality and efficiency, allowing the generation of income.

Community organization and business training will be combined to improve the local capacity in forest management and forest product extraction. Research and development of new technologies will allow for innovation in the quality and types of products local communities produce.

Furthermore, market development activities will be undertaken to improve market access. This combination should enhance the production of forest products from the local communities involved in the project.

G7. Knowledge Dissemination

G7.1. How the relevant or applicable lessons learned will be documented.

All the activities developed by Martin Sagrado Project participants related to the protected areas in the are documented through written reports, including activities such as awareness raising, expeditions for inventories, community meetings, training workshops, zoning workshops, management planning workshops and land use mapping workshops.

This documentation method will also be applied to all the activities to be implemented within the scope of the Martin Sagrado project. All of these reports will be made available on the Internet on Pur Projet website.

G7.2. How this information will be disseminated in order to encourage replication of successful practices

Examples include undertaking and disseminating research that has wide- reaching applications, holding training workshops for community members from other locations, promoting “farmer to farmer” knowledge-transfer activities, linking to regional databases and working with interested academic, corporate, governmental or non-governmental organizations to replicate successful project activities.

The dissemination of general information provided by the project will be achieved through the participation of team members in scientific and general events, both nationally and internationally, related to environmental conservation, climate, and sustainable development.

Furthermore, the project will develop a series of pamphlets, brochures and reports to document and disseminate the lessons learned by the project inside and outside the project boundaries. Other dissemination activities include making presentations at schools, universities and promotional events. The team will also be involved in exchange programs in which communities and local stakeholders participate, allowing the successful replication of project activities elsewhere.

The Martin Sagrado project will promote internal workshops to exchange technical information and experiences among the communities within the project area and also among communities in other protected areas.

The documentation and reporting of the project activities and lessons learned through prior experience in other protected areas in the San Martin region will be the basis for the continual improvement of the processes and methods that will be applied in the management of this project and others that will be created in the future. The exchange of experiences with similar initiatives will also be important for improving the concepts, processes and methods used.

The project’s knowledge dissemination to the community has already begun, with activities such as workshops for introducing the project and discussing climate change issues.

CLIMATE SECTION



IV. CLIMATE SECTION

CL1. Net Positive Climate Impacts

CL1.1. Net Change in Carbon Stocks due to Project Activities

Net Change in Carbon Stocks due to a Decrease in Deforestation Rate

The carbon calculations are based on the VCS VM0006 methodology for REDD. A basic outline of this methodology is provided here. Every project activity is designed to reduce one or more deforestation drivers to some extent. The net change in deforestation rates under the project scenario are calculated by multiplying the relative reduction in deforestation due to project activities with the absolute deforestation rates under the baseline scenario.

$$D_{projectArea,projectScenario,DF}(t,i) = RelativeProjectImpact_{DF}(t) \cdot D_{projectArea,baselineScenario,DF}(t,i)$$

Where:

$D_{projectArea,projectScenario,DF}(t,i)$	= Rate of deforestation within the project area for year t in stratum i under the project scenario. [ha yr ⁻¹]
$RelativeProjectImpact_{DF}(t)$	= Relative impact of all project activities on deforestation during year t (see following Equation). [-]
$D_{projectArea,baselineScenario,DF}(t,i)$	= Baseline rate of deforestation within the project area for year t in stratum i (see Table G14 in the General section). [ha yr ⁻¹]

The relative reduction in deforestation due to project activities is calculated based on the effectiveness of each project activity to reduce every driver of deforestation and the relative contribution of each driver to the total deforestation. Mathematically, the relative impact of a project on the deforestation rate is

$$RelativeProjectImpact_{DF}(t) = \sum_{d=1}^{nrDrivers} RelativeDriverImpact_{DF}(t,d)$$

calculated as:

$$RelativeDriverImpact_{DF}(t, d) = \sum_{a=1}^{nrActivities} (rate(a, t) \cdot effectiveness(a, d) \cdot contribution_{DF}(d))$$

Where:

- RelativeProjectImpact_{DF}(t)* = Impact of all project activities on deforestation, relative to the baseline deforestation rate during year *t*. [-]
- RelativeDriverImpact_{DF}(t, d)* = Relative impact of a driver *d* on deforestation for year *t* of the crediting period. [-]
- nrActivities* = Total number of project activities = 10 for the Oddar Maenchey REDD project. [-]
- nrDrivers* = Total number of deforestation drivers = 11 for the Oddar Maenchey REDD project [-]
- rate(a, t)* = Adoption rate or relative degree of activity for activity *a* during year *t*, with a value of 100% indicates that the activity cannot be more efficient in reducing deforestation. These values are discussed in Section G3.2, and summarized in Table CL2. [-]
- effectiveness(a, d)* = The effectiveness of project action *a* to reduce deforestation driver *d*. These values are discussed in Section G3.2, and summarized in Table CL1. [-]
- contribution_{DF}(d)* = The relative importance of driver *d* in deforestation to the total deforestation, see Table G10. [-]

Following table :

effectiveness(a, d).

Table 25 : Relative Reduction in the Impact of Each Deforestation Driver due to the Different Project Activities (Effectiveness of activity a on driver d)

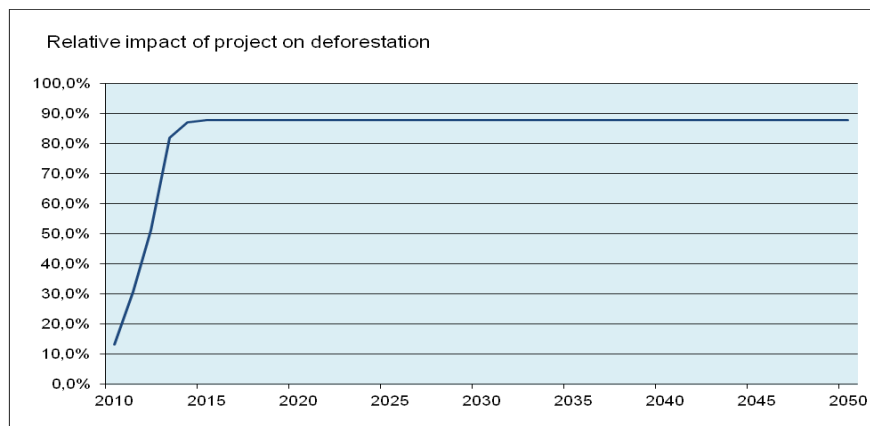
Drivers of deforestation / Activities	Contribution DF (d) Relative importance of driver to total deforestation (%)	Effectiveness (a,d) : Relative reduction in the impact of driver due to activities (%)								
		Legal	Control & Surveillance	Sensibilization & communication	Non Timber forest valuation	Scientific & Inventory	Renewable Energy	Reforestation in agroforestry models	Coordination, Expansion & Transmission	Total
1. Conversion to croplands, pastures and housing	70%	15%	20%	20%	20%	5%		10%		90%
2. Conversion to settlements / infrastructure (Roads, water and	15%	15%	25%	20%		5%	5%		15%	85%
3. Selective logging of high-value species for commercial sales	10%		30%	20%	15%	5%		5%		75%
4. Timber harvesting for local use (housing and infrastructures)	1%			50%			10%	10%	20%	90%
5. Fuelwood gathering	1%			20%			30%	10%	10%	70%
6. Uncontrolled fires	2%		30%	40%					20%	90%
7. Intentional fires (Paths opening and fires for hunting)	1%		30%	15%	30%	5%			20%	100%
8. Mining and Hydrocarbon activities encroachment	0%	40%			40%				20%	100%
9. Economic land concession (timber and agriculture)	0%	50%			50%					100%
Effectiveness of activity on total deforestation		12,8%	21,7%	20,7%	15,8%	4,8%	1,2%	7,7%	3,2%	87,7%

Table 26 :
Adoption rates of activities during the project period

Adoption rate of activity : rate(a,t)									
Project Year	Calendar Year	Legal	Control & Surveillance	Sensibilization & communication	Non Timber forest valuation	Scientific & Inventory	Renewable Energy	Reforestation in agroforestry models	Coordination , Expansion & Transmission
0	2010	10%	0%	30%	10%	20%	0%	30%	30%
1	2011	30%	20%	50%	30%	40%	20%	50%	50%
2	2012	60%	40%	70%	60%	60%	40%	70%	70%
3	2013	100%	80%	100%	100%	80%	60%	100%	100%
4	2014	100%	100%	100%	100%	90%	80%	100%	100%
5	2015	100%	100%	100%	100%	100%	100%	100%	100%
6	2016	100%	100%	100%	100%	100%	100%	100%	100%
7	2017	100%	100%	100%	100%	100%	100%	100%	100%
8	2018	100%	100%	100%	100%	100%	100%	100%	100%
9	2019	100%	100%	100%	100%	100%	100%	100%	100%
10	2020	100%	100%	100%	100%	100%	100%	100%	100%
11	2021	100%	100%	100%	100%	100%	100%	100%	100%
12	2022	100%	100%	100%	100%	100%	100%	100%	100%
13	2023	100%	100%	100%	100%	100%	100%	100%	100%
14	2024	100%	100%	100%	100%	100%	100%	100%	100%
15	2025	100%	100%	100%	100%	100%	100%	100%	100%
16	2026	100%	100%	100%	100%	100%	100%	100%	100%
17	2027	100%	100%	100%	100%	100%	100%	100%	100%
18	2028	100%	100%	100%	100%	100%	100%	100%	100%
19	2029	100%	100%	100%	100%	100%	100%	100%	100%
20	2030	100%	100%	100%	100%	100%	100%	100%	100%
21	2031	100%	100%	100%	100%	100%	100%	100%	100%
22	2032	100%	100%	100%	100%	100%	100%	100%	100%
23	2033	100%	100%	100%	100%	100%	100%	100%	100%
24	2034	100%	100%	100%	100%	100%	100%	100%	100%
25	2035	100%	100%	100%	100%	100%	100%	100%	100%
26	2036	100%	100%	100%	100%	100%	100%	100%	100%
27	2037	100%	100%	100%	100%	100%	100%	100%	100%
28	2038	100%	100%	100%	100%	100%	100%	100%	100%
29	2039	100%	100%	100%	100%	100%	100%	100%	100%
30	2040	100%	100%	100%	100%	100%	100%	100%	100%
31	2041	100%	100%	100%	100%	100%	100%	100%	100%
32	2042	100%	100%	100%	100%	100%	100%	100%	100%
33	2043	100%	100%	100%	100%	100%	100%	100%	100%
34	2044	100%	100%	100%	100%	100%	100%	100%	100%
35	2045	100%	100%	100%	100%	100%	100%	100%	100%
36	2046	100%	100%	100%	100%	100%	100%	100%	100%
37	2047	100%	100%	100%	100%	100%	100%	100%	100%
38	2048	100%	100%	100%	100%	100%	100%	100%	100%
39	2049	100%	100%	100%	100%	100%	100%	100%	100%
40	2050	100%	100%	100%	100%	100%	100%	100%	100%

**Table 27 :
Relative impact of activities on project deforestation over time**

Relative impact of activity on deforestation : Relative Activity ImpactDF (a,t)									
Calendar Year	Legal	Control & Surveillance	Sensibilization & communication	Non Timber forest valuation	Scientific & Inventory	Renewable Energy	Reforestation in agroforestry models	Coordination, Expansion & Transmission	Relative impact of project on deforestation (%)
2010	1,3%	0,0%	6,2%	1,6%	1,0%	0,0%	2,3%	0,9%	13,3%
2011	3,8%	4,3%	10,3%	4,7%	1,9%	0,2%	3,9%	1,6%	30,8%
2012	7,7%	8,7%	14,5%	9,5%	2,9%	0,5%	5,4%	2,2%	51,2%
2013	12,8%	17,3%	20,7%	15,8%	3,8%	0,7%	7,7%	3,2%	81,9%
2014	12,8%	21,7%	20,7%	15,8%	4,3%	0,9%	7,7%	3,2%	86,9%
2015	12,8%	21,7%	20,7%	15,8%	4,8%	1,2%	7,7%	3,2%	87,7%
2016	12,8%	21,7%	20,7%	15,8%	4,8%	1,2%	7,7%	3,2%	87,7%
2017	12,8%	21,7%	20,7%	15,8%	4,8%	1,2%	7,7%	3,2%	87,7%
2018	12,8%	21,7%	20,7%	15,8%	4,8%	1,2%	7,7%	3,2%	87,7%
2019	12,8%	21,7%	20,7%	15,8%	4,8%	1,2%	7,7%	3,2%	87,7%
2020	12,8%	21,7%	20,7%	15,8%	4,8%	1,2%	7,7%	3,2%	87,7%
2021	12,8%	21,7%	20,7%	15,8%	4,8%	1,2%	7,7%	3,2%	87,7%
2022	12,8%	21,7%	20,7%	15,8%	4,8%	1,2%	7,7%	3,2%	87,7%
2023	12,8%	21,7%	20,7%	15,8%	4,8%	1,2%	7,7%	3,2%	87,7%
2024	12,8%	21,7%	20,7%	15,8%	4,8%	1,2%	7,7%	3,2%	87,7%
2025	12,8%	21,7%	20,7%	15,8%	4,8%	1,2%	7,7%	3,2%	87,7%
2026	12,8%	21,7%	20,7%	15,8%	4,8%	1,2%	7,7%	3,2%	87,7%
2027	12,8%	21,7%	20,7%	15,8%	4,8%	1,2%	7,7%	3,2%	87,7%
2028	12,8%	21,7%	20,7%	15,8%	4,8%	1,2%	7,7%	3,2%	87,7%
2029	12,8%	21,7%	20,7%	15,8%	4,8%	1,2%	7,7%	3,2%	87,7%
2030	12,8%	21,7%	20,7%	15,8%	4,8%	1,2%	7,7%	3,2%	87,7%
2031	12,8%	21,7%	20,7%	15,8%	4,8%	1,2%	7,7%	3,2%	87,7%
2032	12,8%	21,7%	20,7%	15,8%	4,8%	1,2%	7,7%	3,2%	87,7%
2033	12,8%	21,7%	20,7%	15,8%	4,8%	1,2%	7,7%	3,2%	87,7%
2034	12,8%	21,7%	20,7%	15,8%	4,8%	1,2%	7,7%	3,2%	87,7%
2035	12,8%	21,7%	20,7%	15,8%	4,8%	1,2%	7,7%	3,2%	87,7%
2036	12,8%	21,7%	20,7%	15,8%	4,8%	1,2%	7,7%	3,2%	87,7%
2037	12,8%	21,7%	20,7%	15,8%	4,8%	1,2%	7,7%	3,2%	87,7%
2038	12,8%	21,7%	20,7%	15,8%	4,8%	1,2%	7,7%	3,2%	87,7%
2039	12,8%	21,7%	20,7%	15,8%	4,8%	1,2%	7,7%	3,2%	87,7%
2040	12,8%	21,7%	20,7%	15,8%	4,8%	1,2%	7,7%	3,2%	87,7%
2041	12,8%	21,7%	20,7%	15,8%	4,8%	1,2%	7,7%	3,2%	87,7%
2042	12,8%	21,7%	20,7%	15,8%	4,8%	1,2%	7,7%	3,2%	87,7%
2043	12,8%	21,7%	20,7%	15,8%	4,8%	1,2%	7,7%	3,2%	87,7%
2044	12,8%	21,7%	20,7%	15,8%	4,8%	1,2%	7,7%	3,2%	87,7%
2045	12,8%	21,7%	20,7%	15,8%	4,8%	1,2%	7,7%	3,2%	87,7%
2046	12,8%	21,7%	20,7%	15,8%	4,8%	1,2%	7,7%	3,2%	87,7%
2047	12,8%	21,7%	20,7%	15,8%	4,8%	1,2%	7,7%	3,2%	87,7%
2048	12,8%	21,7%	20,7%	15,8%	4,8%	1,2%	7,7%	3,2%	87,7%
2049	12,8%	21,7%	20,7%	15,8%	4,8%	1,2%	7,7%	3,2%	87,7%
2050	12,8%	21,7%	20,7%	15,8%	4,8%	1,2%	7,7%	3,2%	87,7%



The full impact of the REDD project is reached after 5 years, after which it is estimated that the deforestation rate is about 12 % of the deforestation rate under baseline conditions.

According to the reduction in the deforestation rate achieved by the project activities, **the project will avoid the emission of 28,3 million tons of CO₂ over the project period** (table xx). This net impact is before taking into account the leakage and the VCS buffer withholdings.

Table 28 : Change in carbon stock after applying relative impact of project

Calendar Year	Baseline scenario		Project scenario	
	Net change in carbon stock (baseline) (TCO ₂ e/year)	Relative impact of project on deforestation (%)	Net change in carbon stock (project) (TCO ₂ e/year)	Net impact of project in carbon stock (T CO ₂ e/year)
2009				
2010	-834 407	13,3%	-723 723	110 684
2011	-834 407	30,8%	-577 452	256 956
2012	-834 407	51,2%	-407 358	427 050
2013	-834 407	81,9%	-151 028	683 380
2014	-834 407	86,9%	-108 974	725 434
2015	-834 407	87,7%	-103 049	731 358
2016	-834 407	87,7%	-103 049	731 358
2017	-834 407	87,7%	-103 049	731 358
2018	-834 407	87,7%	-103 049	731 358
2019	-834 407	87,7%	-103 049	731 358
2020	-834 407	87,7%	-103 049	731 358
2021	-834 407	87,7%	-103 049	731 358
2022	-834 407	87,7%	-103 049	731 358
2023	-834 407	87,7%	-103 049	731 358
2024	-834 407	87,7%	-103 049	731 358
2025	-834 407	87,7%	-103 049	731 358
2026	-834 407	87,7%	-103 049	731 358
2027	-834 407	87,7%	-103 049	731 358
2028	-834 407	87,7%	-103 049	731 358
2029	-834 407	87,7%	-103 049	731 358
2030	-834 407	87,7%	-103 049	731 358
2031	-834 407	87,7%	-103 049	731 358
2032	-834 407	87,7%	-103 049	731 358
2033	-834 407	87,7%	-103 049	731 358
2034	-834 407	87,7%	-103 049	731 358
2035	-834 407	87,7%	-103 049	731 358
2036	-834 407	87,7%	-103 049	731 358
2037	-834 407	87,7%	-103 049	731 358
2038	-834 407	87,7%	-103 049	731 358
2039	-832 739	87,7%	-102 843	729 895
2040	-830 235	87,7%	-102 534	727 701
2041	-827 732	87,7%	-102 225	725 507
2042	-821 891	87,7%	-101 504	720 388
2043	-817 719	87,7%	-100 988	716 731
2044	-812 713	87,7%	-100 370	712 343
2045	-807 706	87,7%	-99 752	707 955
2046	-802 700	87,7%	-99 133	703 566
2047	-796 859	87,7%	-98 412	698 447
2048	-791 018	87,7%	-97 691	693 327
2049	-784 343	87,7%	-96 866	687 477
2050	-775 999	87,7%	-95 836	680 163
Total	-33 899 470		-5 639 872	28 259 598

CL1.2. Net Change in Emissions of Non-CO2 Gases

The decrease in N₂O and CH₄ emissions due to reduced occurrence of fire in the project area are conservatively omitted. These are unlikely to account for more than 5% of the project's emission reductions. There is no other impact on the net changes in emissions of non-CO₂ gases from the project. There is no use whatsoever of any kind of chemical, pesticide or fertilizer, no methane emissions, or of any other GHG.

CL1.3. Other GHG Emissions from Project Activities

No roads in the project boundary and no transport apart from project participants, which are included in Pur Projet carbon footprint evaluation and offset program.

CL1.4. Net Climate Impact of the Project

The project has a positive net climate impact of about 28,3 million TCO₂e that are generated during its 40 year duration before considering Leakage and Buffer (see table xx).

CL1.5. Specification How Double Counting is Avoided

The carbon credits generated from the project will be registered under the Verified Carbon Standard and sold under that mechanism. Credits from the project will not be registered or sold under any current regulatory scheme, as these schemes currently don't allow REDD credits to be sold. If and when the credits become eligible under a regulatory scheme, the proper procedures will be taken to ensure that credits are not sold twice.

CL2. Offsite Climate Impacts (“Leakage”)

CL2.1. Determination of Leakage Type and Extent

Determination of Leakage Type

Leakage has been cited as being a major obstacle for the development of avoided deforestation projects (e.g., Schlamadinger et al., 2005; Miles and Kapos, 2008). If the project is successfully able to reduce deforestation in the project areas, solely to be transferred to areas outside the project boundaries, this would not achieve the desired environmental benefits of the project. However, the mere potential for leakage does not necessarily negate the environmental integrity of an avoided deforestation project. Only in cases where potential leakage cannot be identified and quantified does leakage pose an insurmountable barrier. In addition, the leakage risk can be mitigated by incorporating leakage prevention activities into the project activities. Activities adopted to minimize leakage, and make communities less dependent on deforestation include agroforestry, introduction of fuel-efficient cookstove, solar panels, and non-timber forest activities (ecotourism, seeds extraction, botanical garden, etc). This project recognizes three different leakage types: (1) activity-shifting leakage within the leakage belt, immediately adjacent to the project sites (2) activity-shifting leakage outside of the leakage belt, and (3) market leakage.

• **Activity-shifting leakage versus market leakage.**

Activity-shifting leakage refers to the increased deforestation outside of the project area due to the project-related displacement of agents of deforestation from the project area. Market-effect leakage occurs when prices and market forces are affected by project activities, influencing the economic attractiveness of deforestation. This may occur, for example, by reducing the rate of illegal logging for commercial on-scale. The reduction in illegal logging can increase the price of illegally logged wood in the area, which will make illegal logging in other areas more attractive. A more in-depth review of leakage can be found in Aukland et al., 2003¹. The conservative quantification of market leakage is based on coefficients set by the VCS AFOLU guidance.

¹ Aukland, L., P.M. Costa, and S. Brown. 2003. *A conceptual framework and its application for addressing leakage; the case of avoided deforestation. Climate Policy* 3:123–136.

- **Activity-shifting leakage within the leakage belt vs. activity-shifting leakage outside of the leakage belt.**

Some drivers are acting at a local level and are geographically constrained and will shift pressure from the project area to right outside of the project area, in an area that is referred to as the leakage belt. However, other drivers are geographically unconstrained and might shift pressures to areas far away outside of the project area. Examples of geographical constrained drivers are fuel-wood collection or collection of timber for local use. The range of action local agents of deforestation is constrained by the time it takes to move from a dwelling to the place of deforestation. Examples of geographical unconstrained drivers are oil exploration and migrant encroachment. Only activity shifting leakage within the leakage belt can be monitored. Activity-shifting leakage outside of the project area cannot be monitored as it can happen in completely different areas. As a consequence, loss of carbon credits from activity shifting leakage within the leakage belt can be estimated ex-ante but monitored and integrated ex-post for the calculation of the actual carbon credits. Activity shifting leakage outside of the leakage belt can only be conservatively estimated ex-ante using a factor approach and used in ex-post calculations. The assumptions made while assigning these factors must be monitored during the crediting period. Factors will be updated upon a validation of the baseline.

A typology of the leakage caused by every identified driver of deforestation is included in table xx .

Determination of Leakage Extent

The relative impact of leakage is quantified by ex-ante leakage cancellation factors, which express the driver-specific relative amount of leakage for the amount of deforestation that is avoided. For example, a leakage cancellation factor of 20% translates into a loss of 20 tons of credits through leakage from a project activity with a greenhouse gas benefit of 100 tons within the project area. In other words, the net greenhouse gas benefit would be 80 tons in this example.

The methodology to quantify losses in carbon credits from leakage is included in the next section. This quantity describes the proportion of the (expected) gross emission reductions inside the project area that are lost again due to leakage outside of the project area. Only changes that are directly attributed to project activities should be included in the cancellation rate. For example, if preventing illegal encroachment within the project area by patrolling saves 500 ha of forest per year, but directly leads to an increased deforestation outside of the project area of 300 ha, the cancellation rate of illegal encroachment prevention is 60%. The following section contains a justification of the selected leakage cancellation rate for every identified driver.

Extent of leakage belt and leakage intensity

The project area is located directly next to the National Park Rio Abiseo to the South, to the concession for conservation Alto Huayabamba to the West, the Municipal Conservation area of Leymembamba community to the North West, to municipal conservation areas of Santa Rosa and Pucalpillio and deforested areas to the South East. In all these areas, leakage is impossible as they are already area dedicated to conservation, or already deforested areas.

Therefore, the area where leakage can happen in the project zone is limited to the forests to the North and the East of the project zone. On these sides, accessibility is low (mountain ranges), limiting the potential displacements of deforestation agents, and limiting the extent of the leakage belt

Finally, to the East (left bank of Huayabamba), area is already attributed as timber concessions, with concessionaires owning the rights on this land. It is therefore likely that they will also fight any encroachment, migration, deforestation threats on their land.

Figure 33: Map of leakage belt

(In bright blue, the leakage belt)

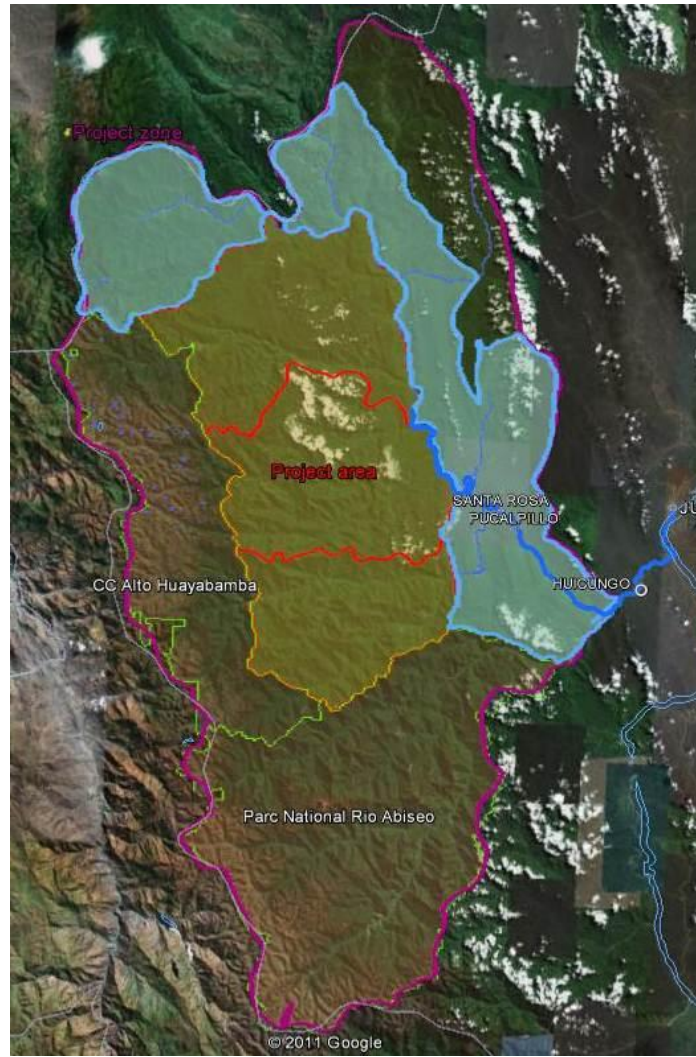


TABLE 29 : Summary of Leakage cancellation rate per driver and total leakage amount under project scenario

Drivers of deforestation	Leakage cancella	Total amount
	Total leakage cancellation rate	leakage (T CO2e of loss)
1. Conversion to croplands, pastures and housing	15%	-2 967 258
2. Conversion to settlements / infrastructure (Roads, water and electricity)	15%	-635 841
3. Selective logging of high-value species for commercial sales	30%	-847 788
4. Timber harvesting for local use (housing and infrastructures)	30%	-84 779
5. Fuelwood gathering	20%	-56 519
6. Uncontrolled fires	0%	0
7. Intentional fires (Paths opening and fires for hunting)	10%	-28 260
8. Mining and Hydrocarbon activities encroachment	30%	0
9. Economic land concession (timber and agriculture)	30%	0
Total		-4 620 444

1. Conversion to Croplands

The availability of arable land is typically less of a constraint than the availability of farm inputs or water. Agroforestry and improvements in agricultural efficiency will improve crop yields from existing agricultural land, preventing the need for further deforestation to create new land to grow crops. Also, development of non-timber forest activities bringing additional revenues will prevent the local populations to increase their agriculture activities for income purposes. Also, project participants will have approved binding forestry agreements preventing the expansion of croplands within the project areas. Still, it is expected that about 15% of the impacts of reducing the conversion to cropland within the project area will be annulled in the leakage area.

2. Conversion to Settlements

Project participants will have approved binding forestry agreements that prevent the clearing of forestland for the creation of new settlements. In addition participatory land use plans will reduce the accelerated deforestation from random conversion to settlements. Furthermore, improvements in infrastructure subsidized including water distribution and purification in existing settlements will reduce the need for settlement expansion. With these measures, it is estimated that 15% of the benefits from reducing the forest area for conversion to settlements will be cancelled due to increased conversion in the leakage area.

3. Selective logging for commercial sales

Illegal loggers denied access to the project areas by forest patrols will also shift the location of their logging operations to alternate locations outside of the project area. Most of the land is already dedicated to commercial logging, so activity shifting leakage will be low. On the contrary, market leakage can be expected as the project will increase the rarity of high value species and will likely trigger some logging in

other places. This will result in an estimated a 30% leakage cancellation rate, mainly due to market leakage outside of the leakage belt.

4. Timber Harvesting for Local Use

The need for timber on a local level will not decrease as a result of project implementation. However, some timber can be harvested from areas undergoing reforestation (agroforestry or assisted natural regeneration) and by controlling the timber harvesting, the adverse effects of timber harvesting will be controlled. Therefore, a moderate 30% leakage cancellation rate is assumed. Since the timber is harvested for local use, leakage from this driver will be confined to the leakage belt.

5. Fuel-wood Gathering

Because of very limited population within the project boundary compared to the total area, even in the neighboring communities, there should not be significant leakage. Moreover, the project will help the communities switch to more fuel-efficient cookstoves and solar energy, reducing the need for fuelwood. However, to remain conservative, we estimate a 20% leakage cancellation rate within the leakage area.

6. Uncontrolled fires

Uncontrolled fires are triggered by slash and burn practices in agriculture parcels outside of the project area. The project will not displace the effect of this fire (in the leakage belt, fires are also already occurring), but will target the source of the fires, trying to reduce the occurrence. There is no leakage for this driver.

7. Intentional Fires

Hunters denied access to the project areas by forest patrols will shift the location of their hunting grounds to alternate locations. The use of forest fires to concentrate and drive animals from forest cover will shift to the leakage belt, however it is not very much developed in the area, and there are very few hunters. This results in a 10% leakage cancellation rate. Since hunters are usually not living within the project area, but roaming around, the leakage is not confined to the leakage belt.

8. Mining and Hydrocarbon activities encroachment

It is likely that oil and mining companies that are not able to explore and extract in the project area due to the legal registration of the project and its protection like via forest patrolling will search for other concessions elsewhere (not likely outside the San Martin region). In addition, oil and mining companies are not geographically constrained as they operate at national or international level and can open new exploration fronts in any other region. However, not all exploration activities will be conducted in forested areas. Therefore, an expected leakage of 30% is estimated.

9. Economic Land Concessions

Economic Land Concessions granted by the MAFF will not be allowed within the project areas. However, a number of large ELCs will continue to be granted at the national level. Since the project design will have affected national policies to a certain extent, the effective cancelling rate is envisioned to be around 30% outside of the project area.

**TABLE 30 : Leakage cancellation rate for every driver
divided into the three leakage types**

Drivers of deforestation	Leakage cancellation rates			Total leakage cancellation rate
	Activity shifting inside leakage belt	Activity shifting outside leakage belt	Market leakage	
1. Conversion to croplands, pastures and housing	5%	10%		15%
2. Conversion to settlements / infrastructure (Roads, water and electricity)	5%	10%		15%
3. Selective logging of high-value species for commercial sales			30%	30%
4. Timber harvesting for local use (housing and infrastructures)	30%			30%
5. Fuelwood gathering	20%			20%
6. Uncontrolled fires				0%
7. Intentional fires (Paths opening and fires for hunting)		10%		10%
8. Mining and Hydrocarbon activities encroachment		30%		30%
9. Economic land concession (timber and agriculture)		30%		30%

CL2.2. Documentation and Quantification of How Leakage will be Mitigated

Leakage is mitigated by implementing specific project activities that either increase livelihoods or reduce the need for land, or sales of timber related activities.

Project activities provide new livelihoods and will therefore reduce the need for local communities to deforest land for subsistence agriculture. Such project activities include participatory measurement and monitoring, forest patrolling, construction of walkways, assisted natural regeneration and enrichment planting and technical and financial assistance to develop agro-forestry and agro-ecological practices.

Project activities will increase the efficiency of already-deforested land for producing crops or providing settlement area by organizing stakeholder-driven Participatory Land Use Plans, and agricultural organic intensification.

Project activities will decrease the use of wood from the forest by increasing the efficiency of wood-stoves and solar panel within the renewable energy plan.

CL2.3. Subtracting Project related Leakage from Carbon Benefits

Similar to the calculations above, the exact methodology for quantifying leakage is based on a VCS methodology that is currently undergoing validation. The procedure to quantify losses from activity-shifting or market leakage is summarized below. Briefly, the effect of leakage can be quantified by multiplying the expected leakage cancellation rates with the rates by which the influence of each driver is reduced and the net decreases in deforestation due to project actions. This can be done separately for activity-shifting

leakage within the leakage belt, activity-shifting leakage outside of the leakage belt, and market leakage. The following formula can be used:

$$\Delta D_{LK,DF}(t, i) = RelativeLeakageImpact_{DF}(t) \cdot D_{projectArea,baselineScenario,DF}(t, i)$$

Where:

$\Delta D_{LK,DF}(t, i)$	=	Leakage-induced increase in deforestation rate within forest stratum i for year t of the crediting period. [ha yr ⁻¹]
$RelativeLeakageImpact_{DF}(t)$	=	Total relative impact of leakage on the decrease in GHG emissions due to project activities for deforestation for year t of the crediting period. [-]
$D_{projectArea,baselineScenario,DF}(t, i)$	=	Baseline rate of deforestation within forest stratum i and the project area for year t of the crediting period. [ha yr ⁻¹]

The relative impact of leakage is quantified by ex-ante leakage cancellation factors, which express the driver-specific relative amount of leakage for the amount of deforestation that is avoided. This quantity describes the proportion of the (expected) gross emission reductions inside the project area that are lost again due to leakage outside of the project area. Only changes that are directly attributed to project activities should be included in the cancellation rate. For example, if preventing illegal encroachment within the project area by patrolling saves 500 ha of forest per year, but directly leads to an increased deforestation outside of the project area of 300 ha, the cancellation rate of illegal encroachment prevention is 60%. Once the leakage cancellation rates are fixed for every driver d , they can be calculated as following:

$$RelativeLeakageImpact_{DF}(t) = \sum_{d=1}^{nrDrivers} leakage(d) \cdot RelativeDriverImpact_{DF}(t, d)$$

where:

$RelativeLeakageImpact_{DF}(t)$	=	Total relative impact of leakage on the decrease in GHG emissions due to project activities. [-]
$leakage(d)$	=	Leakage cancellation rate for avoiding deforestation of fuel-wood collection. [-]
$RelativeDriverImpact_{DF}(t, d)$	=	Relative impact of a driver d on deforestation for year t of the crediting period. [-]

About 16,3% of the climate benefits from the REDD project within the project area is annulled by increased emissions outside of the project area due to activity-shifting or market leakage. Most of the leakage is due to activity shifting leakage outside of the leakage belt, followed by activity shifting leakage inside of the leakage belt, and market leakage.

Table 31 : Losses of Carbon Credits through Leakage and Final Carbon benefits from project including Losses from Leakage and buffer

Calendar Year	Baseline scenario			Project scenario		
	Net change in carbon stock (baseline) (TCO2e/year)	Net change in carbon stock (project) (TCO2e/year)	Net impact of project in carbon stock (T CO2e/year)	Leakage (T CO2e/year)	Buffer (20 %) (T CO2/year)	Net Impact of project including Leakage and Buffer (T CO2e/year)
2010	-834 407	-723 723	110 684	-18 097	-22 137	70 450
2011	-834 407	-577 452	256 956	-42 012	-51 391	163 552
2012	-834 407	-407 358	427 050	-69 823	-85 410	271 817
2013	-834 407	-151 028	683 380	-111 733	-136 676	434 971
2014	-834 407	-108 974	725 434	-118 608	-145 087	461 739
2015	-834 407	-103 049	731 358	-119 577	-146 272	465 509
2016	-834 407	-103 049	731 358	-119 577	-146 272	465 509
2017	-834 407	-103 049	731 358	-119 577	-146 272	465 509
2018	-834 407	-103 049	731 358	-119 577	-146 272	465 509
2019	-834 407	-103 049	731 358	-119 577	-146 272	465 509
2020	-834 407	-103 049	731 358	-119 577	-146 272	465 509
2021	-834 407	-103 049	731 358	-119 577	-146 272	465 509
2022	-834 407	-103 049	731 358	-119 577	-146 272	465 509
2023	-834 407	-103 049	731 358	-119 577	-146 272	465 509
2024	-834 407	-103 049	731 358	-119 577	-146 272	465 509
2025	-834 407	-103 049	731 358	-119 577	-146 272	465 509
2026	-834 407	-103 049	731 358	-119 577	-146 272	465 509
2027	-834 407	-103 049	731 358	-119 577	-146 272	465 509
2028	-834 407	-103 049	731 358	-119 577	-146 272	465 509
2029	-834 407	-103 049	731 358	-119 577	-146 272	465 509
2030	-834 407	-103 049	731 358	-119 577	-146 272	465 509
2031	-834 407	-103 049	731 358	-119 577	-146 272	465 509
2032	-834 407	-103 049	731 358	-119 577	-146 272	465 509
2033	-834 407	-103 049	731 358	-119 577	-146 272	465 509
2034	-834 407	-103 049	731 358	-119 577	-146 272	465 509
2035	-834 407	-103 049	731 358	-119 577	-146 272	465 509
2036	-834 407	-103 049	731 358	-119 577	-146 272	465 509
2037	-834 407	-103 049	731 358	-119 577	-146 272	465 509
2038	-834 407	-103 049	731 358	-119 577	-146 272	465 509
2039	-832 739	-102 843	729 895	-119 338	-145 979	464 578
2040	-830 235	-102 534	727 701	-118 979	-145 540	463 182
2041	-827 732	-102 225	725 507	-118 620	-145 101	461 785
2042	-821 891	-101 504	720 388	-117 783	-144 078	458 527
2043	-817 719	-100 988	716 731	-117 186	-143 346	456 199
2044	-812 713	-100 370	712 343	-116 468	-142 469	453 406
2045	-807 706	-99 752	707 955	-115 751	-141 591	450 613
2046	-802 700	-99 133	703 566	-115 033	-140 713	447 820
2047	-796 859	-98 412	698 447	-114 196	-139 689	444 562
2048	-791 018	-97 691	693 327	-113 359	-138 665	441 303
2049	-784 343	-96 866	687 477	-112 402	-137 495	437 579
2050	-775 999	-95 836	680 163	-111 207	-136 033	432 924
Total	-33 899 470	-5 639 872	28 259 598	-4 620 444	-5 651 920	17 987 234

CL2.4. Inclusion of Non-CO2 Gases in Calculations

Non-CO2 emissions would be included if significant but there is no non-CO2 emissions generated by project activities. No fertilizer or pesticides are used, no methane emissions. These emissions are considered as nil.

CL3. Climate Impact Monitoring

CL3.1. Plan for Selecting and Monitoring Carbon Pools

The following table contains a justification for which carbon pools were selected. Non-CO2 GHG were not included in monitoring because they are expected to be less than 5% of the total CO2 equivalent benefits generated by the project.

Table 32 : Carbon Pools Selected in this Project

Carbon Pool	Selected	Justification/ Explanation of Choice
Above-ground tree biomass	yes	Major carbon pool affected by project activities
Above-ground non-tree biomass	no	Can be conservatively omitted because no conversion occurs to a land use with high non-tree biomass occurs
Below-ground biomass	yes	Major carbon pool affected by project activities
Dead wood	yes	Included because project activities may lead to a decrease in the dead wood pool when biomass is removed for fire prevention and reducing the fuel-load or sustainable fuel-wood collection
Litter	no	Expected to decrease under baseline conditions, is therefore conservatively omitted
Soil organic carbon	no	Expected to decrease under baseline conditions, is therefore conservatively omitted
Wood products	no	No commercial timber operations take place under the project scenario. A decrease in long-lived wood products from reducing illegal timber logging is insignificant.

CL3.2. Development of a Full Monitoring Plan

Pur Projet will develop a full monitoring plan within 12 months of validation of the project. A monitoring plan that is consistent with the VCS methodology will be finalized upon validation of the project under VCS standard. The monitoring plan will be adjusted to be compatible with a potential future National Carbon Accounting System; this adjustment will be done in collaboration with the regional roundtable Mesa REDD San Martin. The results of monitoring will be made publically available and communicated to local.

COMMUNITY SECTION



V. COMMUNITY SECTION

CM1. Net Positive Community Impacts

CM1.1. Methodologies to Estimate Impacts on Communities

Net Positive Community Impact Methods

The project initiated an ongoing series of community dialogues in November 2009 providing the communities to voice their aspirations and problems. The project development team of Pur Projet worked with ACOPAGRO Cooperative managers and agronomists to conduct a series of village Participatory Rural Appraisals (PRAs) and community sketch maps to assess proposed project areas. The PRAs continued on an ongoing manner since the beginning of the project.

The discussions focused on local drivers of deforestation, management problems, social conflicts, as well as priorities for development and perceived livelihood opportunities. Participants in the discussions included: Amazonia Viva staff, ACOPAGRO managers and agronomists, elected Community Forest management committee members, local farmers, and both men and women household heads.

Positive Community Impacts

Pur Projet and Amazonia Viva have identified three major project goals that will benefit forest dependent communities:

- improve the quality of the forests;
- maximize benefit flows to the local communities participating in the
- develop new REDD project sites that will benefit other forest-dependent communities.

The project will directly benefit communities by:

- engaging with local communities in the design and development of the project;
- providing training and support to local village organizations to build forest management capacity and develop agro-forestry and agro-ecological practices;
- Promoting to the Peruvian Government recognition of local communities forest management rights;
- generating carbon revenues that the community will use for forest restoration employment, improving farming systems, establishing micro-finance organizations, and capitalizing small livelihood enterprises;
- maintaining the access and use rights of local communities to continue harvesting NTFPs for customary use from the project area forests.

Based on project budget projections direct support for community forest protection and restoration will employ 5 people full-time from local communities, and support local police officers and Forest

Administration, while small grants for NTFP development and agricultural organic intensification will employ at least another **5 people full-time**.

The project strategy includes the following activities:

- **Improve the Quality of the Forest**

A substantial portion of project carbon revenues will be utilized to improve the quality of the forests, largely through supporting community protection and restoration efforts. Conserving and improving forests will enhance environmental services including microclimate stability, NTFP productivity and other benefits of importance to local communities. Leaders and members of the CFMC groups will receive training in forest management, agro-forestry as well as in resource planning, forest restoration, eco-tourism, microfinance, and small enterprises.

During the first two project years, the ACOPAGRO officers and implementing organizations will work with the Community Forest Management Committees (CFMC) in the project areas to strengthen forest protection capacity including forest patrols, fire control systems, and addressing resource conflict issues. Pur Projet, ACOPAGRO and the CFMC have formalized a Memorandum of Understanding to implement the REDD project. Project CFMC and their members are legally, technically, and financially supported to play a primary role in stopping the major drivers of deforestation and degradation currently operating in the project area and leakage belt. This is the most important action required to achieve the REDD project goals. Community action to secure forest boundaries by social fencing and by intensifying protection is the key strategy to control illegal logging, migrant encroachment, and fires. The first project budget allocates financial support for labor and equipment to establish forest boundary demarcation, walkway improvement, patrol hut construction and purchase of boards and patrol equipment.

In years 3 through 40, aside from support for forest protection, this REDD project will secure carbon credits through forest management activities allowable under REDD.

Forest management will focus on assisted natural regeneration and enrichment planting of degraded forest land, agro-forestry and agro-ecological practices. The project target will target 10,000 hectares of degraded forests (within the project area and in the leakage area and neighbouring communities) for regeneration during the first 20 years. Funds for the ANR activities will be directed to project communities primarily for labor and materials. The project planners estimate that this will provide approximately 10 person days of employment per hectare, meaning 5 000 workman days each year (500 ha each year during the first 20 years), equivalent to **20 full time employees**. Community members will be employed mainly during the agricultural off-season, meaning an average 40 people employed for a period of 6 months every year.

On the whole, the project will provide 30 full time jobs opportunities to the communities, for a total of 1 500 household, meaning social impact is very important. In terms of operations, 40 people will be employed for ANR activities during 6 months with 10 others will be employed all year round, meaning 50 people will participate in the project activities from the participating communities, equivalent to one person per household. Through micro-credit activities and other non-allocated budget for now, this potential of socio-economic impact can be as well greatly increased.

This will strengthen the project since all families will benefit directly from project activities.

- **Maximize Benefits to Local Communities**

The project will provide small grants to the communities associations to undertake:

- NTFP development activities
- Project promotion activities

- NRA and social development activities
- agroforestry development activities

According to discussions, small grants mechanism will be available for community members based on local level planning and participation of communities associations members in the application process. The project implementation team and partners will continue to provide training in bookkeeping and assist project participants to strengthen community institutions and accounts. Small grants are likely to include capital investment in NTFP enterprises including seed collection, medicinal plants planting and processing as well as NRA and social development projects including English speaking classes, cultural classes on traditional crafts and dances, school support and health, according to community priorities.

To reduce leakage and increase food security in the project area, support will also be provided to innovative local farmers who agree to conduct farming system trials. The project will facilitate access to technical extension services regarding promising methods for organic intensifying farming systems in a sustainable manner through the use of better water, green fertilizer, seed, and cultivation techniques. This will be linked to an ACOPAGRO program to improve agricultural and agro-forestry resources, with a focus on small grants and agricultural trials.

- **Compare the With-project Scenario and the Baseline Scenario of Social and Economic Well-being**

In Section G2.1, the economic and tenure situation of the project community and the drivers of deforestation are described in the Without-project Scenario. It is clear that without a project, several outcomes are likely, including:

- increasing conflict with migrants, and concessionaires;
- loss of control over forest lands;
- deforestation of local forests critical for livelihood and environmental services;
- growing poverty and social marginalization;
- loss of biodiversity.

The project works to forge an alliance between project community and the ACOPAGRO Cooperative, as well as with other local stakeholders, providing legal recognition of community rights to manage and utilize local forests. Aside from enhancing tenure security, the project will bring in significant direct and indirect employment opportunities and investment funds for resource and community initiatives over a 40 year period, providing a stable financing mechanism for long term social and economic development.

- **Stakeholder Dialogue**

The project implementation team has engaged a range of stakeholders in discussions to guide the design of the project including Pur Projet team, Amazonia Viva and ACOPAGRO Management and field staff, commune, district, and provincial government officials, civil society organizations including local NGOs, as well as the forest dependent communities that represent the primary stakeholders. The ACOPAGRO Cooperative has played a critical role in supporting consultation at all levels.

An initial exploratory field visit was conducted by Pur Projet in 2009. In February 2010, a PRA exercise was held within the communities including semi-structure interviews and group discussions resulting in an initial social assessment. A more in-depth research project was conducted involving extensive dialogue with the organizing community members. A follow-up workshop with stakeholders was held in april 2010 at ACOPAGRO's offices in Juanjui. Each workshop has increased the knowledge and understanding of stakeholders regarding the goals and strategies that will be adopted under the project. It has also provided the project design team with inputs regarding local priorities and modes of operation.

Over the course of the project, annual stakeholder dialogues with a focus on project communities will be held to generate feedback and information necessary for project adaptation and documentation. The stakeholder dialogue will be held towards the end of each calendar year over a two week period allowing for decentralized, village level meetings culminating in a provincial workshop. The findings from the meetings will be posted on the project website.

Communities are the primary stakeholders of this project and all decisions will be made via the approval by the CFMCs, these are the main backbones of this project, fully based on the grassroots will and decisions.

CM1.2. Demonstration that no HCV Areas are Negatively Affected

The project aims at protecting the forest in the project area, which provides the environmental and socio-economic services mentioned in sections G1.8.4-6 (water resources regulation, fishing, hunting, turism). In addition, the project will also value and protect the cultural wealth of the area by developing a reasonable local eco/ethno-tourism. Therefore, the project's goal is directly to protect the HCV areas mentioned in G1.8.4-6.

CM2. Offsite Stakeholder Impacts

CM2.1. Identification of Negative Offsite Stakeholder Community Impacts

The social appraisals indicate that the distance of community impact beyond the project area is very limited. This is due to the fact that the land and forest beyond the project area has in many cases been claimed by other communities, “market driven” forces through the granting of ELCs, or has been cleared and settled by migrants moving into the region from other provinces. In the past 20 years, San Martin Province has transitioned rapidly from an “open frontier” environment to a “claimed domain” context. This is largely driven by many migrants seeking land for agriculture and resale, as well the dynamics of land speculation and oil exploration.

As explained in CL 2.2, due to difficulty of access and hilly landscapes, a minimal number of deforestation drivers are expected to shift from the inside of the project zone to areas outside of the project zone. The drivers of deforestation that may be affected by project activities beyond the project zone include:

- forest clearing for oil exploration
- forest clearing for agriculture expansion by migrants entering the area;
- forest clearing for settlement expansion;

However, migration outside of the project zone is happening already today in the same proportion as in the project zone. There will therefore not be any significant impact on migration outside of the project zone. Similarly for oil and mining exploration, oil and mining companies are already targeting all areas they can have access to, inside or outside the project zone. The project will not increase pressure from these companies on the other areas.

As a result the impact for communities outside of the project is expected to be minimal. In most cases drivers of deforestation are carried out by local communities’ members. By providing alternative forest-based incomes to local communities deforestation activities should discontinue and not just shift to another location.

CM2.2. Offsite Impact Mitigation Strategies

The project implementation team will assist project communities in establishing a dialogue with migrants to the area to inform them of the communities areas and management rules that govern them. Awareness-raising for participating and neighbouring communities will be addressed through discussions and trainings, billboards, boundary demarcation, and meetings, with encouragement for surrounding migrant communities to emulate sustainable forest management practices under future REDD expansion. The project will also facilitate a natural resource management planning process with project neighboring communities that would involve local migrant families. This process would result in the formulation of land-use plans that will lead to more sustainable development in the areas outside the immediate project. Agricultural intensification projects will help boost farm output, encourage farmers to put energy into increased production, rather than further forest clearing. Fuel-wood needs will be reduced through the extension of a fuel-efficient stove and solar panels program that will reduce fuel-wood consumption for cooking and lighting among project households. Forest management plans reflecting NRA and enrichment planting activities will be developed by the communities to ensure that sufficient timber can be produced on a sustainable basis to meet local house construction requirements.

CM2.3. Demonstration that Well-being of Other Stakeholder Groups has not been Negatively Impacted

The project is designed to minimize any negative offsite impact. By building and empowering community institutions to manage and conserve local forests, creating employment and livelihood opportunities, and assisting in the formation of capital in community micro-finance institutions, this project will have a little negative offsite impact. The project will include all neighboring communities outside the project area in its socio-economic monitoring activities. This should allow feedback from non-project communities in the area concerning the negative and positive ways in which the project impacts them. The implementing organization team would also respond to queries and problems related to the project that may arise in neighboring non-project communities.

CM3. Community Impact Monitoring

The project partners have already drafted a monitoring plan based on indicators developed as part of the project methodology. The next stage in this process will be to fully involve local communities in developing their own articulation of indicators to track community impacts, the results of which will be integrated in the overall monitoring plan. The project will align to new monitoring standards such as REDD+ as they are further defined.

CM3.1. Selecting Community Variables to be Monitored

The project communities will be involved in an annual participatory monitoring exercise to assess the extent to which project activities are achieving the community and project goals. The following aspects will be monitored:

- social indicators;
- economic indicators;
- institutional indicators;
- biodiversity indicators;
- environmental indicators;
- carbon stocks and forest condition.

All methods will rely on community input regarding project impacts. Parameters to be measured will include:

- community member knowledge, attitudes, and behaviors related to the project, especially levels of participation;
- changes to forest related income and employment;
- institutional capacity to manage natural resources and finances;
- improvements in forest habitat and sighting frequency for indicator species;
- changes in carbon stock levels and forest conditions.

A detailed list of indicators to monitor and tools for monitoring is available in the preliminary monitoring plan.

Data will be collected through community focus group discussions, in-depth interviews, and sample surveys. This annual participatory assessment will be supplemented by field trip reports and the minutes of meetings facilitated by the ACOPAGRO Cooperative support. Longer term measurement of the impact of the project on local communities will be gathered through periodic sample surveys conducted with project families. Longer term measurement of the impact of the project on local communities will be gathered through periodic sample surveys conducted with project families. These surveys will cover a range of issues including income, land tenure, and employment, education, social capital, and resource availability and will be used to quantitatively measure socio-economic changes in the project communities.

CM3.2. Assessing Effectiveness of High Conservation Value Monitoring

Special attention will be given to High Conservation Value (HCV) areas specific to meeting community needs, such as areas with high concentrations of medicinal trees, trees for seedlings or other important non-timber forest products, along with traditional spirit forests and areas where rare or threatened wildlife have been sighted. Many HCV have already been identified and marked by GPS. These areas will be monitored similar to the aspects of community variables as listed above. Data on HCV areas will be collected through community focus group discussions, in-depth interviews, and field surveys within the HCV area. The effectiveness will be assessed by HCV areas not being negatively affected by project implementation over time. The effectiveness will further be monitored by reviewing interviews of community members over time. If the project is successful these interviews should show positive attitudes towards care of the HVC areas.

CM3.3. Community Impact Monitoring Timeline

A full community impact monitoring plan will be developed within six months of the validation date through collaboration between the implementing partners and Pur Projet. Participatory trainings on REDD project monitoring will be conducted with all the project communities in order to consult on required indicators and prepare local capacity for monitoring. The results of monitoring will be made publically available and posted on Pur Projet and/or ACOPAGRO project website. A central database will compile information to be uploaded to the project website. Communication to local communities and stakeholders will be consistent to that described in Section G3.8 and will be made available in local language (Spanish) when relevant.



CM4. Capacity Building

CM4.1. Accommodate with the needs of the communities

The community members and local stakeholders are already involved in the implementation of the project activities and will continue to participate throughout the entire process of developing the project. The project will provide organizational, management and technical capacity building activities to underscore the ownership of the local people's management of the Martin Sagrado project area, as well as to insure their involvement in decision-making and implementation of programs and in conservation and sustainable development efforts. Workshops, training sessions and events for sharing experiences will be organized to provide community people and local stakeholders with the necessary tools to improve their ability to manage their environment in a lasting and sustainable way.

The management plan will include community-strengthening activities aimed at promoting the organization of community groups and the training of community members in sustainable production methods to improve their earning capacity. Other activities will be done to improve the quality of life in the communities.

The activities and trainings already planned for promoting capacity building for the project communities are better described in item CM4.4.

CM4.2. Wide range of groups

The concept of "elite" does not exist within the existing social structures in the Martin Sagrado project zone. In the area, economic conditions are very homogeneous. The only observed difference is between those individuals who live in communities with higher levels of social organization and those people living in communities that are still in the process of organizing themselves.

CM4.3. Women participation

The management plans developed does not differentiate between women and men regarding their participation in decision-making, development and implementation of plans and activities, as well as in capacity building efforts.

Equal rights and opportunities will be provided to local people without consideration of their gender. If during the process of implementing the project a need to promote gender equality is identified, then appropriate programs will be developed and implemented.

CM4.4 –Community participation in project implementation

In addition to the participation of community people in the community forest committees, and in decision making regarding the development and implementation of the project's management plan, several other programs will be implemented that require community participation, including:

- **Voluntary Environmental Agents Program:** The voluntary environmental agents are individuals without authority who are committed to the conservation of natural resources. These agents acts as multipliers of the awareness within the community and communicate with the authorities when there has been an infraction of the reserve's rules and regulations. The Voluntary Environmental Agents Program is

envisioned as a way of providing individuals interested in participating in environmental education, conservation, preservation and protection of natural resources of the protected area.

• **Biodiversity and Natural Resource Use Monitoring Program** : This program will prepare and accredit community members and inhabitants of the protected areas to participate and collaborate in natural resource monitoring activities. This program will generate information about the status of biodiversity, its uses and threats. The duties of these monitors are as follows:

- Census monitor – performs a weekly collection of information about natural resource use.
- Fishing monitor – collects data about the production, marketing and selling of fish at the major docks in the municipality.
- Boat monitors – collects data on the transit of boats at strategic points in the protected area.
- Fauna monitor – monitors the presence and quantity of animals in the forest
- Road Monitor – monitors the road traffic and types of goods transported

• **Forestry Management**: It is crucial for project success that good practices in Forestry Management are developed with the community. Some material will be distributed, and workshops will be planned in order to provide sufficient knowledge so that the community people can continue their forestry activities, without damaging the natural resources.

• **Environmental Awareness**: A program will be implemented at the public schools to train teachers and distribute material, so they can understand and disseminate information related to their reality, such as sustainability and climate change. It is believed that this measure will increase people's knowledge about their reality, situation and responsibilities related to sustainable development and nature conservancy, also increasing the success of the project in reducing deforestation.



CM5. Best Practices in Community Involvement

CM5.1. Knowledge of local customs

The Martin Sagrado project was created through a participatory process. This process included meetings and public hearings; interviews were performed with broad participation by local communities and stakeholders. The management plan is also developed by a participatory process, considering that community people and other local stakeholders know their environment and understand their conditions and needs better than anyone else.

Local participatory studies show that local communities in the Martin Sagrado project zone are willing to improve their livelihoods with maintaining the environmental quality of their forests. It is important to point out that the teams that conducted these studies have extensive knowledge and experience in the reality of the Amazon.

Most of the communities of the project zone are cocoas producers Fairtrade certified. The implementation of Fair trade projects has already trained the communities to the process of deciding how to use the financial resources for community associations.

CM5.2. Employment positions

The majority of the local stakeholders that are expected to be involved in the implementation of the project will be part of the communities. Some specific actions (e.g., carbon and biomass dynamics studies) may require specialized professionals, who will perform this work on a contract basis. Local people will be prepared and trained, and will have the opportunity to be hired within some of the programs to be implemented as part of the development of this project (e.g., biodiversity monitors, climate monitors). They will also be invited to work in supporting field activities from project.

CM5.3. International rules on worker rights

Hired people for the project will be made aware of their rights and obligations in their contracts as required by law. The recruiting done by Amazonia Viva Foundation is subject to the institution's external auditing. The implementation of the project guarantees the compliance of all social legal requests of Workers legislation, health and work security.

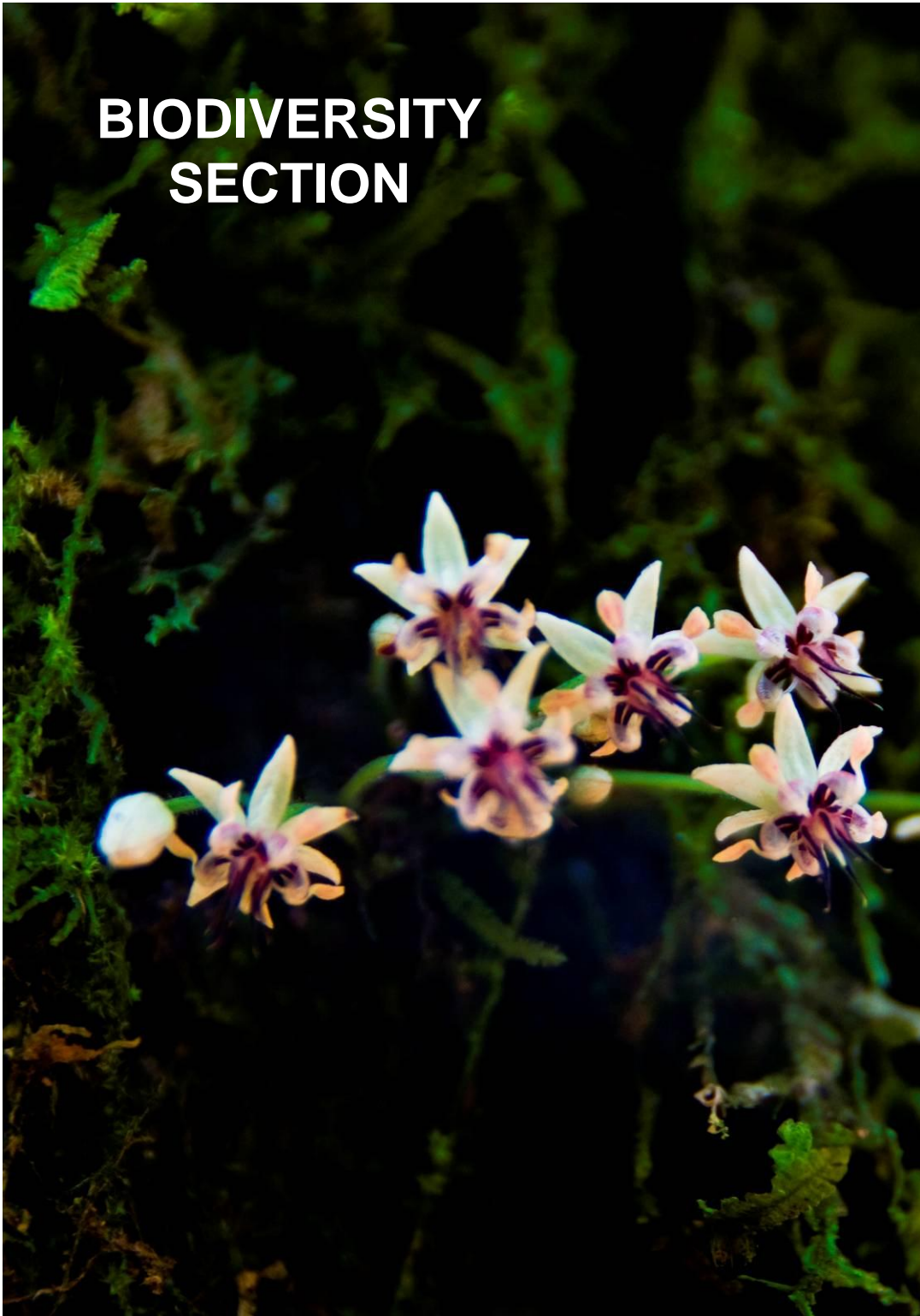
CM5.4. Substantial risk to worker safety

Local communities are accustomed to living in the forest ecosystems and to being surrounded by an environment rich in biodiversity. Major risks that could arise from the implementation of this project are related to potential forestry and forest management activities, the use of machinery and equipment, and the other related activities that are part of the process for implementing the sustainable production activities that will be promoted for the project's communities. Whenever necessary, appropriate training will be offered to people involved in such activities, including all safety procedures and the use of protection equipment that can manage the risks and avoid unnecessary accidents

CM.5.5. Minimize working risks

In order to avoid the risks in activities related to community-based forestry and forest management, during the implementation of such programs the workers will receive specific training for the activities, in addition to information on how to minimize the risk of accidents. The special training includes major procedures to be adopted to reduce accidents during these activities, such as the use of personal protection equipment (special boots, helmets, suits, tools, medicine, etc.) and the guidance and instructions to use, fill and transport the sawmill and other machinery.

BIODIVERSITY SECTION



VI. BIODIVERSITY SECTION

B1. Net Positive Biodiversity Impacts

The main goal of the project is to avoid ensure the conservation of key habitat for threatened flora and fauna over 313 000 hectares and avoid the deforestation and degradation of 53 000 hectares, constituted by rich and threatened flora and fauna ecosystems. The project seeks to conserve and regenerate forest ecosystems through improved protection from illegal logging, fire, and through assisted natural regeneration activities and agro-forestry practices. This strategy would restore unique habitat for amphibians, reptiles, mammals, and birds, while restoring high value and endangered tree species (see annex 3 for a list of potential species). The project will also create greater awareness among local communities regarding the value of biodiversity, as well as build monitoring, patrolling, and habitat restoration skills, which will result in better controls over hunting, poaching, and damage to critical habitat. Mobilizing the communities committees to engage in biodiversity conservation will also result in the community establishing rules and sanctions prohibiting hunting and regulating non-timber forest products collection to sustainable levels.

In the without-project scenario forest cover is expected to continually decrease causing a loss of biodiversity, quantity of species present, and quality of forest ecosystems. Under the with-project scenario forest cover will increase and forest ecosystems will be enhanced. Native species to the project area are expected to flourish with the project. Overall the project will have a net positive benefit to biodiversity in the project area.

B1.1. Methodologies Used to Estimate Changes in Biodiversity

The proposed participatory biodiversity monitoring methodology draws on the systems articulated by Finn Danielsen (Danielsen, Finn *et al.* "A simple system for monitoring biodiversity in protected areas of a developing country" Biodiversity and Conservation (9:1671-1705), 2000).

This simple system was selected because it not only provides a cost-effective, field-based monitoring system, but it also creates a sense of ownership among resident people over the biological resources and their conservation. The main elements of the biodiversity monitoring system include:

- standardized recording of routine observations;
- fixed point photography;
- line transect surveys;
- focus group discussions.



These methods have been field tested. These groups have confirmed the importance of involving local villagers in biodiversity assessment and monitoring in order to incorporate existing knowledge in the survey and build commitment to the monitoring program. Several key indicator species will be selected and monitored to track the impact of project activities in comparison to the baseline. At least one of these indicator species will be a species which has a market value and is commonly traded, thus indicating the human-wildlife dynamic as it evolves.

B1.2. Demonstration that High Conservation Value (HVC) Areas will not be Negatively Affected

Since the goal of the project is to enhance and protect forest resources, areas that are of High Conservation Value will not be negatively affected. These areas of special environmental, biological, and rare ecosystem significance are expected to flourish throughout and beyond the life of the project. Areas that provide habitat for IUCN listed species are part of the protected project area. The participatory biodiversity inventory and monitoring has started in April 2010, and provides identification of any protected species. The latter is consistent with the IUCN RED List. Some of the species mentioned in G1.8.1 have already been identified in the project area. Without the project these areas of special value are expected to decrease with the loss of forest cover.

B1.3. No introduction of invasive species in the Project Area

The Martin Sagrado Project is based on the management and conservation of native species and natural ecosystems. No activity involving invasive species will take place in the project area. The Assisted Natural Regeneration will involve only native species from the project area.

B1.4. No negative impacts of non-native species

No non-native species will be used within the project area.

In the project zone, outside the project area, reforestation activity in agroforestry models will be conducted. 80% of the trees planted will be native timber species from the project zone, only a small proportion will be exotic species (Teak), however non-invasive. Teaks have been planted in the past in San Martin region in various plantation initiatives without negative biodiversity impacts.

Pur Projet and Acopagro have implemented a reforestation program in the San Martin region in the last 4 years, planting 9 species of native timber trees, and Teaks in small proportion. Experience shows that non-native species are not invasive and do not impact negatively local ecosystems (no plagues, no diseases)

The use of Teaks also in small proportions is interesting for the economic sustainability of agroforestry models, given their rapid growth, high timber value and good market. They also combine well with cocoa crops, and are well taken care of by the farmers. Ensuring good alternative revenues to the farmers from to successful agroforestry models is key to reduce deforestation pressure due to local community economic drivers.

B1.5. Guarantee that No Genetically Modified Organisms (GMO) will be used in the Project

The Project Design Team guarantees that no genetically modified organisms are included in this project design and that no genetically modified trees shall be planted under the project. In addition, agricultural interventions under the project will also avoid purchase of genetically modified organisms, and this requirement will also be specified in any sub-contracts with technical support or extension agencies.

The Project Design Team recognizes that genetically modified organisms are becoming more common for a source of seed, fast growing trees, and livestock feed all over the world, and San Martin Province is no exception. Though we can guarantee that the project will not use any genetically modified organisms we cannot regulate the flow of community resources such as feedstock, and foods such as rice or other grain use in and out of the project areas.

B2. Offsite Biodiversity Impacts

B2.1. Identification of Potential Negative Offsite Project Impacts

The implementation of the project is not restricted to the strict project area. Buffer zones and leakage management belt in the project zone, which will be included in the monitoring program. The monitoring of resources will include the monitoring of areas around the reserve, which will result in the project's positive biodiversity impacts being extended to the areas adjacent to the area. The monitoring and surveillance programs will generate the necessary information for avoiding and managing negative offsite impacts, such as those caused by illegal logging, deforestation, etc.

Since the project will also support neighboring communities in restricting hunting and fire in the project and leakage areas, the project might displace some pressure from hunting or NTFP gathering pressures outside of the leakage belts. However, given the difficulty of access and obstacles to displacement of activities outside of the leakage belts, negative offsite project impacts will likely be insignificant.

B2.2. Mitigation Strategies for Negative Offsite Biodiversity Impacts

Strategies will be developed with project and neighboring communities to compensate for any loss in income or harvested forest products due to project-related restrictions. Sustainable harvesting methods for NTFPs will be included as part of a capacity building and livelihood program both within the project areas and in the leakage belt to mitigate the negative impacts of displaced NTFP collection. Many of the native species of flora are utilized by resident communities for subsistence purposes. These include a variety of tubers from native climbers and selected green leaves for vegetables. Bamboo is used for construction. Some hardwoods are used for house and tool construction, while many herbs are utilized as traditional medicines. The community-based biodiversity inventory will document all flora and fauna and their uses. Species that are reported to be scarce may receive protection or harvesting regulations based on these findings.

B2.3. Unmitigated Negative Off-site Biodiversity Impacts

No major unmitigated impacts on biodiversity are anticipated due to the project emphasis on community-based habitat restoration and the support program for biodiversity conservation. The benefits greatly outweigh any negative biodiversity impact.

B3. Biodiversity Impact Monitoring

B3.1. Biodiversity Monitoring Plan

The monitoring plan will follow the directives scientific inventories of biodiversity, which involve monitoring the species richness of animals (mammals, birds and reptiles, as well as associated products like eggs and leather) and plants (timber and non-timber products) utilized by the communities. If these species are found to be in decline, management and protection actions will be undertaken to guarantee their conservation. This monitoring is expected to generate the knowledge required to develop proposals for managing these resources appropriately.

The specific objectives of the biodiversity monitoring plan are to:

- Raise awareness among community members about the relevance of monitoring natural resource use to establish the rules for their sustainable use.
- Train community members in the protected areas to operate as monitors of biodiversity.
- Monitor species used by local communities, such as synergistic fauna (mammals, birds), commercial fish species and timber and non-timber species;
- Monitor “special interest” species, critically endangered species, endangered species, and species in threat of extinction (IUCN).
- Monitor land use and changes in vegetation cover .
- Monitor boat traffic in the area of the project.

Participatory methods will consistently be used by the monitoring program, from its creation to the evaluation of the results obtained and in discussions regarding new approaches. The monitors will be trained to perform their specific jobs, and present the results obtained from the surveys.

The biodiversity monitoring plan’s goals, indicators, monitoring frequency, and methodology is described in preliminary monitoring plan

Table 33 : Biodiversity monitoring Indicators

Goal	Indicators	Monitoring Frequency	Method/data source
Villagers are aware of biodiversity conservation goals	Proportion of villagers who have heard about project conservation activities	5 years	Socio-economic sample survey
Degraded forests are regenerating	Number of hectares of degraded forest where assisted natural regeneration activities undertaken last year (ANR, Enrichment Planting, Fire Control)	Annual	Project Report-field inventory
Forest fires are decreasing	Number of hectares burned last year	Annual	Project report-field inventory
Biodiversity increase and protected	Number of sightings of key indicator species last year by community members or through camera traps	Annual	Project report-field inventory

The biodiversity monitoring plan will be finalized within 6 months after validation.

The collection of data by the community members will be recorded on data sheets provided by the project's technical team. These sheets allow for the standardization of the information collection and permit information storage and processing.

Moreover, the program will count on the support of fisherman-collaborators who will collaborate on scientific research of interest and who will support the diagnostics of resource use. The program's technical team is responsible for validating the data, entering it into a database, and GIS. ACOPAGRO will perform data analysis, monitor the system and coordinate the logistics of the program.

Together with the monitoring, scientific research inventories will also be conducted, aimed at monitoring the biodiversity with more accuracy, as well as increasing the knowledge about recently discovered species and those that have not yet been described. Following the same methodology, it is possible to have the same basis of comparison between both data and to have more accurate results relating to their alteration over time.

The main assumption of the program is that through scientific research on the Martin Sagrado area's biodiversity (e.g., ecology of species, dynamics of populations, etc.) the subsidies to improve the Management Plan of the Reserve will be obtained, helping also to identify the needs and opportunities for the next research and monitoring activities. The knowledge about the conservation status of the threatened species in and around the Reserve will be improved, which will lead to specific measures for protecting these species.

Through the knowledge of these data, it is possible to have an overview of the availability of exploited species, generating information about the level of exploitation. These data can help to generate measures for instructing the communities about how to use the natural resources in a sustainable way, without affecting either their needs or the resources.

B3.2. Assessment of the Monitoring Plan Effectiveness

The project intends to rely on community participation for monitoring biodiversity and High Conservation Value (HCV) areas in the project area, with support and technical consultation from a locally-based agency. Community members will be tasked with monitoring a number of biodiversity indicators to track the effectiveness of habitat conservation measures.

These include the following:

- changes in number of sightings of designated species or resource use;
- changes in size of vegetation type blocks;
- changes in frequency of detection of designated fauna species along established transects;
- changes in perceived harvest volume per effort.

The indicators are designed to focus on trends in biodiversity and habitat quality. Special attention will be given to High Conservation Value areas, based on community and team discussion of the monitoring results, each year the CFMC and project implementers will identify any additional actions that need to be taken and integrated into the coming annual work plan.

B3.3. Commitment to Biodiversity Monitoring Plan Timeline

A full biodiversity monitoring plan will be developed by the implementing partners, in collaboration with the Forestry Administration (INRENA), within six months of the project start date. The results of monitoring will be made publically available and provided to Pur Projet and ACOPAGRO to be put on the internet. Communication to local communities and stakeholders will be consistent to that described in Section G3.8 and will be made available in Spanish.

B4. Water and Soil Resource Enhancement

B4.1 – Project activities are likely to enhance water and soil resources

The appropriate conservation measures within the Martin Sagrado area and its buffer areas will allow the forests and rivers to remain in their natural state. This is key for maintaining the natural hydrological cycles, the quality and quantity of the water and soil conservation.

B4.2 – Improvement of water and soil resources compared to the baseline

One of the consequences of the conversion of the Amazon forest into pasture will be a decline in rainfall in the Amazon and adjacent regions, considering that these rains comes from the water that is recycled through evapotranspiration (FEARNSIDE, 1997).

Undisturbed forest has very low rates of soil and sediment loss. Deforestation generally increases rates of soil erosion by increasing the amount of surface runoff. The effect is considerably less than that which would exist with the presence of leaf litter, stems and branches. Roots increase the permeability of soil, increasing the absorption and infiltration of water. Forests also contribute to terrestrial evaporation and regulate the humidity of the soil through transpiration. Leaf litter and other organic residues transform the physical properties of the soil, increasing its capacity to hold water and nutrients. Deforestation can change the quantity of water present on the surface and underlying soil layers as well as the humidity in the atmosphere. Furthermore, these processes influence the rates of erosion and availability of water for ecological processes and for the maintenance of environmental services.

The creation and implementation of the Martin Sagrado project will protect not only the biodiversity of forests, but also the quality of life of the local inhabitants, and the climate. It will conserve the quality of soil and water, and the equilibrium of key processes like local hydrological cycles.



**GOLD LEVEL
SECTION**



VII. GOLD LEVEL SECTION

GL1. Climate Change Adaption Benefits

GL1.1. Likely Regional Climate Change Variability

In Peru, occurrences of extreme climatic conditions including heavy rainfall during extended periods, flooding, as well as extended droughts are increasing in frequency. Extended dry periods are also exacerbating forest fires, resulting in fires burning larger areas with more intensity compared to the past. This pattern of increasing climatic variability will likely affect the project area by decreasing forest cover and exacerbating deforestation.

In the absence of the project forest cover will be decreased, increasing ground fuels, and subsequently fire frequency and intensity. Forest fires will likely burn into any existing forests further decreasing biodiversity. As fires initiate forest clearing for agriculture, climate change will likely exacerbate land use change to agriculture, with poor results due to intensified drought, and worsened weather patterns.

Scientific articles and reports on the topic:

- 1) Houghton, J. T; Y. Ding, D. J. Griggs; M. Noguer; P. J. van der Linden; X. Dai; K. Maskell; C. A. Johnson. 2000. Climate Change 2001: The Scientific Basis: Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate Change
- 2) Millar C.I., N. L. Stephenson, and S.L. Stephens 2007. Climate Change and Forests of the Future: Managing in the Face of Uncertainty. *Ecological Applications* 17(8): 2145-2151.
- 3) Davis, M. B. 1989. Lags in vegetation response to global climate change. *Climate Change* 15:75-82.
- 4) Smith J.E., and D.A. Tirpak, eds. 1989. Potential impacts of climate warming vol. 1, Regional Studies, Chapter 4. EPA-230-05-89-050. Washington D.C.: U.S. Environmental Protection Agency.

GL1.2. Identification of Risks to the Project and Risk Mitigation Strategies

Though the project is expected to conserve biodiversity, the effects of climate changes on species are not completely known. Research suggests that creating diverse forest conditions is a good way to have forests adapt to climate change when the outcome is not known. We anticipate that preserving and increasing forest cover will aid as a buffer for species to slowly adapt to climate change. Species are expected to move upslope as temperatures increase. Wildlife is expected to migrate faster than plant species which may leave wildlife without suitable habitats.

Throughout project implementation special attention will be given to species migration. As native tree species are planted project implementers will work to increase corridors, as well as increasing forest cover upslope. Species will be planted that are not known to be sensitive to changing temperatures.

GL1.3. Demonstration that Climate Change Impacts Community Well-being and Biodiversity

Many farmers within the project areas depend on rain-fed crops, and extended droughts present the biggest problems to these communities. Farmers are already affected by drought in the neighboring communities and continuing climate change will exacerbate these conditions.

Farmers in the project zone are mainly cocoa producers. The comparison of cocoa yields between communities located upstream on the banks of Alto Huayabamba, where area is still quite forested, and communities located in the deforested plain around Juan Jui, shows that cocoa yields are 5 to 7 times higher in the forested areas (1.5 to 2 tons per ha vs. 300kg per ha), with the same crop and same cultivation techniques. The farmers in the deforested area around Juan Jui suffer from lack of shade and water, especially in the dry season. They are also more threatened by propagation of fires.

Forest fire frequency and intensity is expected to increase with droughts, and will also greatly affect communities. Increased fire will destroy forest, and associated products from food crops to timber. Increased fire intensity may also destroy homes and settlements as many communities are in close proximity to forests.

On the other side, in the rainy season, the heavy rains becoming more and more frequent given the changing climatic conditions, coupled with the absence of forest covers would result lead widespread splash and sheet erosion that would decrease soil fertility, as well as increase land slides risks, therefore threatening communities.

Since many community members depend on forests for livelihoods for some or part of the year, climate change will cause an increasing loss of livelihoods.

GL1.4. Demonstration that Project Activities Assist Communities and Biodiversity to Adapt to Climate Change



The project team is developing strategies to respond to more severe weather conditions that may emerge in the project area as a result of climate change. The project will focus on retaining maximal forest cover to minimize micro-climatic change and ensure slowed water run-off and optimal ground water recharge as ways to mitigate drought. The project will provide small grants to participating communities for develop agro-forestry and agro-ecological practices to ensure crop protection during climate change educed droughts. The potential devastating impact of forest fires will be minimized by educating local people (and hunters) on the importance of preventing forest fires. The project will also support the development and improvement of the walkways one of the most necessary needs expressed urgently by the local community. Assisted Natural Regeneration of degraded forest patches will ensure that forest restoration is based on native species that can adapt to local soil, water, and climatic conditions.

Reforestation activities with project communities will also be developed to guide the restoration of degraded forests each year. The project will result in the enrichment planting of indigenous trees in forest gaps and deforested areas, which will help reduce erosion and slow water run-off. The Community Forestry Management Committee will also be trained and supported to implement better fire fighting techniques including the establishment and management of village fire brigades, and the establishment of stronger fire prevention regulations.

GL2. Exceptional Community Benefits

The project will train Community Forestry Groups in project communities in managing forest protection, reforestation operations, enrichment planting, and project management. This will include project planning, budgeting, bookkeeping, reporting, and technical techniques. Once trained, Community Forestry Groups will be asked to work with the project implementer to develop annual work plans and directly manage project operations in their area. As a consequence, communities will not only be participating in the project, but will be responsible for much of the actual management.

The project seeks to build the community capacity not only to staff, but to manage project activities. Community members have been involved in project preparation work since the beginning. Any activities developed with the Community Forestry Groups will naturally involve the hiring of project community members. Technical support will be provided largely by ACOPAGRO staff, who are residents within the province.

GL2.1. Demonstration that the Project Zone is a Low Human Developed Country

The participants are poor and earn an average \$1000 to \$3000 per year. Many households live below the poverty line in San Martin, making San Martin typical for rural provinces within Peru.

See section G.1.5.6 for incomes and resources of participatin communities.

The project communities are heavily dependent on forest resources and ecosystemic services for their livelihood, and consequently the emphasis on improved forest management achieve both community and project objectives. Capacity building plans for the project include forest management and planning, protection, silviculture, agro-forestry, agro-ecological practices and nursery management. ACOPAGRO has developed training modules and training teams have already guided hundreds of village participants and local NGO staff through these short courses.

The project implementing organization will also plan to extend the capacity building program to encompass a number of other topics related to the project including bookkeeping and financial management, agricultural techniques, NTFP processing and marketing strategies, and water resource management. The Project Implementers will be responsible for working with partners and communities to develop a range of training modules in these fields as well, which will be provided to community members and leaders through short term training programs. In addition, technical support and financing will be available to ensure community trainees are able to utilize their new skills.

GL2.2. Demonstration that the Poorest Communities will Benefit from the Project

Low income households in San Martin Province rely solely on agricultural and forest products as their only significant source of income. Forest protection and forest improvement will help these communities by protecting and enhancing their livelihoods. With project implementation alternative sources of income will be provided and many households that have the lowest income will benefit the greatest.

The Project Design Team has relied substantially on the knowledge of the ACOPAGRO staff who works with some of the poorest communities. This has given the Project Design Team a better understanding of local culture and adapting project strategies to blend well with local values and beliefs. Those whose livelihood depends on the forest will have the best local knowledge of common forest practices, local ecology and traditional customs.

The project will support such traditions by protecting sacred groves and areas with high cultural values, and integrating them with biodiversity conservation strategies. The locations of these areas will depend on local knowledge and create employment for the poorest communities who depend on forest resources. Local

cultural traditions include the protection of burial forests, spring forests, and spirit forests which will be integrated into the conservation and management plan for the area. Important rituals and beliefs, as well as local knowledge will help mold the project and link activities wherever possible. Because such importance has been given to poorest community input, these community members' livelihoods are expected to benefit greatly.

GL2.3. Demonstration that Poor and More Vulnerable Households will not be Negatively Affected

The project will work with communities' leaders to identify members who are in need of fulltime or part-time employment and provide specific training for project involvement. Special attention will be given to ensuring that the capacity building opportunities are shared fairly among the community and that disadvantaged households, especially the poorest community members, receive special attention. A significant barrier to low-income groups has been a lack of access to and education about alternative incomes. They also lack specific necessities to link them to larger markets, and the capital needed to start alternative incomes. This project will both educate local communities in the many income topics listed above as well as aid in the basic knowledge of literacy and bookkeeping. By capacity building within communities and by connecting communities both with each other and ACOPAGRO Cooperative, households will be able to network resources and access larger markets.

The project will also facilitate a number of micro loans that will directly benefit disadvantaged and low-income households by providing the initial capital needed to generate alternative incomes. Village youth from low income families will be engaged as fire watchers, forest monitors, and nursery managers, and in other related roles.

Women will be targeted for training in craftwork, literacy classes, bookkeeping and management of micro-finance groups. Women are already playing an important leadership role in the CFMC. The project will support and encourage women's leadership in CFMC governance including management and planning activities. The project will also attempt to create linkages between women leaders in other stake-holding institutions such as ACOPAGRO and local government. The project will identify women leaders in the CFMC and in villages who can help organize capacity building activities where women's involvement or expertise is high, such as certain NTFP collection, processing, ecotourism and marketing or in household financial management. Training modules and programs specifically designed for women may include bookkeeping and microfinance organization management, marketing, and handicraft production. The organization of Self Help Groups and literacy programs for women will also be explored. Gender awareness will be raised among the communities as a whole in order to create increased appreciation and opportunities for women's participation.

GL2.4. Demonstration that Disadvantaged Groups will not be Negatively Affected

Often disadvantaged groups become associated with jobs of greater health risk. Workers may be at risk from forest fires, and falling trees associated with thinning operations. Special attention will be given to make sure that the communities work group will be from diverse backgrounds and that knowledge of any risk associated with project employment is understood by all means possible.

GL2.5. Community Monitoring of Disadvantaged Groups

Community monitoring will be continual with an annual participatory exercise to assess the extent to which project activities are achieving the community and project goals. The monitoring exercise specifically looks at social indicators and relies on community input. Special attention will be given to disadvantaged groups and women's input, attitudes, behaviours, and levels of participation in the project. If disadvantaged groups are lacking in participation of any part of the project, ACOPAGRO Cooperative, who has worked with the community in the past, will collaborate on ways to have better communication.

GL3. Exceptional Biodiversity Benefits

GL3.1. Demonstration of High Biodiversity Conservation Priority through the Vulnerability Criterion

As described in section G1.8.1.b, 21 species on the IUCN red list have been registered and identified with a high probability of occurrence in the project area, 1 being critically endangered (CR) and 4 being endangered species (EN).

TABLE XX : Endangered species in the proposed project zone

ESPECIES	GRADO DE AMENAZA		
	PERU	UICN	CITES
FLORA			
<i>Cyathea spp.</i> "helecho arbóreo"	--	--	II
<i>Podocarpus oleifolius</i> "saucecillo"	CR	LC	--
<i>Ceroxylon crispum</i> "palma de cera"	VU--	--	--
<i>Cedrela odorata</i> "cedro"	VU	VU	III
<i>Cedrela montana</i> "cedro"	VU--	--	--
<i>Cedrela lilloi</i> "atoc cedro"	EN	EN	--
<i>Swietenia macrophylla</i> "caoba"	VU	VU	II
<i>Polylepis multijuga</i> "quinoa"	EN	VU	--
<i>Juglans neotropica</i> "nogal"	NT	EN	--
FAUNA			
Aves			
<i>Aulacorhynchus huallagae</i> "tucancito semiamarillo"	EN	EN	--
<i>Aburria aburri</i> "pava negra"	NT	NT	--
<i>Hemispingus rufosuperciliaris</i> "hemispingo cejirufu"	VU	VU	--
<i>Leptosittaca branickii</i> "loro de mejillas doradas"	VU	VU	II
<i>Thripophaga berlepschi</i> "rabiblando bermejo"	EN	VU	--
Mamíferos			
<i>Oreonax flavicauda</i> "mono choro de cola amarilla"	EN	CR	I
<i>Aotus miconax</i> "mono nocturno"	EN	VU	II
<i>Callicebus oenanthe</i> "mono tocon andino"	VU	EN	II
<i>Pudu mephistophiles</i> "sachacabra"	EN	VU	II
<i>Tremarctos ornatus</i> "oso de anteojos"	EN	VU	I
<i>Panthera onca</i> "otorongo"	-	VU	I
<i>Tapirus terrestris</i> "sachavaca"	-	-	II

Elaborated by AMPA. Source. UICN 2008, CITES, PERU 2004 y 2006.

Through project implementation many endangered and vulnerable species will potentially be protected and populations enhanced. The project will directly help IUCN endangered indigenous tropical hardwoods by planting the species within the project area. The project will also directly affect IUCN endangered, threatened and vulnerable wildlife that use the project area or the services they provide.

