

MONITORING & IMPLEMENTATION REPORT

LACANDÓN – FOREST FOR LIFE REDD+ PROJECT



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COVER PAGE

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ii. Project location	La Libertad and Las Cruces Municipalities, North West of Petén Department, Guatemala
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v. Project lifetime	Project start date: February 1st 2012 Project lifetime: 30 years GHG accounting period: February 1st 2012 - January 31st 2042
vi. Project implementation period covered by the PIR	February 1st 2012 – August 24th, 2014
vii. CCB History	Full Validation Date: 18 June 2016 CCB Standard Third Edition & VCS Standard Version 3. Gold Level Criteria: Exceptional Climate, Community and Biodiversity Benefits.
viii. Edition of CCB Standard Being Used	Third Edition
ix. Summary of Climate, Community and Biodiversity Benefits Generated	The Sierra del Lacandón National Park is one of the seven nucleuses of the Mayan Biosphere Reserve. The <u>climate objectives</u> are covered through the implementation of activities to reduce deforestation and forest degradation by decreasing illegal timber extraction and assuring legality of land use through sustainable forest management. These activities contribute to reduce GHG emissions and increase carbon stocks over time. Twenty (20) workshops on forest fires were realized by FDN in different communities in order to reduce deforestation. The VCUs tradable for the monitoring period are 369,982.0 tCO₂-e in a project area of 45 288.81 ha corresponding to the forest area of Unión Maya Itzá, La Técnica Agropecuaria and La Lucha cooperatives; and the private properties of Fundación

	Defensores de la Naturaleza, Naranjitos and Centro Campesino. The <u>community objectives</u> take into account the strengthening of local governance; developing timber and non-timber forest management plans, environmental education and technical workshops. One of the main activities is to invest in education that reduces the necessity for deforestation, which is covered by the strategy of “Community dialog, education and capacitation”. Additionally, the project activities consider the transfer of knowledge to the communities in aspects related to health and welfare and their relation with daily practices, like the awareness about sexual and reproductive knowledge and facilitate access to means of family planning and water management, including the management of human waste and use of latrines. There has been active participation of women in the project and also are beneficiaries of the microcredit program (seven (7) women and six (6) men), which has had a return rate of 100%. For the monitoring period, eleven (11) agroforestry promoters were trained, and La Lucha cooperative achieved its Forest Management Plan. By 2014, fourteen (14) persons had permanent contracts for the Sierra del Lacandón Natural Park Management. Thirty-one (31) lectures on family planning were developed, as well as fourteen (14) workshops on environmental education and sustainable production. These were complemented with workshops on climate change and REDD+ projects. The <u>biodiversity objectives</u> focus on the identification, prioritization and implementation of actions for the sustainable management of natural and cultural resources. This objective is achieved through the main strategies of “Forest protection and biodiversity programs” and “Diversification and use of communal forestry resources”, where the development of sustainable forest management plans for small holders and communities is important. Monitoring of jaguar (<i>Panthera onca</i>), tapir (<i>Tapirus bairdii</i>) and white-lipped peccary (<i>Tayassu pecari</i>) was performed, quantifying and detailing the presence of these species as indicators of forest status in the SLNP. In addition, through the use of a camera trap sampling method, it has been possible to identify other species in the project area. 768 patrols have been performed to avoid illegal logging, hunting and potential invasions. Twenty-three (23) people were caught conducting some type of illegal activity. The record of threatened species shows the presence of 39 jaguars, 114 tapirs and 123 peccaries, higher values than were recorded in the baseline. By reducing deforestation, the environmental functioning of the
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	diverse ecosystems will be maintained, the tangible cultural heritage will be preserved, and greenhouse gas emissions from deforestation and degradation processes will be prevented.
x. Gold Level Criteria Being Used and Summary of Gold Level Benefits Generated:	<u>Climate benefits:</u> Guatemala is particularly vulnerable to the effects of climate change. It is expected that by 2050, there will be an average temperature increase of nearly 2 °C due to deforestation that leads to lower rainfall and higher temperatures. Climate benefits are being achieved through the implementation of activities to reduce deforestation and forest degradation. The project explicitly addresses scenarios that are predicted to occur with future climate change, such as selecting agricultural techniques that conserve moisture and soil fertility. Some project activities beneficial to climate change adaptation include: • Diversification of employment and income beyond agriculture, such as identification of new NTFP. As standard practice, the project will monitor household income, class, and gender of any direct beneficiary of the project's activities. • Improvement of agricultural practices with the aim of higher productivity and slowing the rate of hectares deforested (per household per year). FDN has worked directly with the cooperatives of the first instance and other communities in the project zone. FDN has also carried out workshops on climate change, forest fires, community governance and health. In addition, in the biodiversity areas has been implemented agroforestry activities, community plots, enrichment and conservation of forest. These measures contribute to the communities adapt to climate change. <u>Community benefits:</u> The population of the three cooperatives of the first instance, according to the baseline diagnosis, have a high poverty rate. Project activities are designed and implemented to reduce these rates and produce benefits through alternative activities such as agroforestry, improving the non-timber products value chain (i.e. xate), enriching plots and increasing productivity per hectare. Strengthening management capabilities contributes to community empowerment and the achievement of sustainable forest management in these areas. The project activities benefit women through the establishment and reinforcement of a program of micro-credits. In the first phase, the program has achieved a total of 16 beneficiary families with women as leaders who conducted business activities with a return rate of 100% (investors in buying poultry and basic grains, in books, and pharmaceuticals, among other activities). Moreover, the project activities build and strengthen the management capabilities of the Women's Committee of Ramon (<i>Brosimum alicastrum</i>), comprised by 17 women of the La Lucha cooperative. In addition, the project strengthens decision-making and capabilities of communities, especially the

	operational capacity of forest adaptation through the workshops developed. Finally, members of the cooperatives have formed a project committee, acting as both private owners and project partners. Cooperatives are represented by two (principal and auxiliary) representatives in the REDD+ Governance Committee, where the principal representative has voice and vote in all decisions regarding the project. <u>Biodiversity benefits:</u> Three species of conservation classified in the Red List of International Union for Conservation of Nature (IUCN) has been monitored in the period 2012 - 2014. These are the "Near Threatened" jaguar (<i>Panthera onca</i>), the largest feline in Latin America and part of Guatemalan culture for centuries, the "Endangered" tapir (<i>Tapirus bairdii</i>), the largest land mammal in the Neotropics and the only living representative of the order Perissodactyla, a species considered nationally endangered, and the "Vulnerable" white-lipped peccary (<i>Tayassu pecari</i>). The results show the presence (quantity) and dynamics of fauna as well as the conservation status of the forest. The registers for the threatened biodiversity show the presence of 39 jaguars, 114 tapirs and 123 peccaries; higher record values than the baseline. Forest conservation has been possible through forest incentives and reforestation with native species, also included in the IUCN, such as Mahogany - <i>Swietenia macrophylla</i> and Cedar - <i>Cedrela odorata</i>.
xi. Date of Completion of this Version and Version Number:	28 August 2016 Version 02
xii. Expected verification schedule	February 2016

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1 GENERAL

1.1 Summary Description of the Project

G1.3 This report describes the results of the Climate, Community and Biodiversity Monitoring of the Lacandón - Forests for Life REDD+ project. The monitoring period for both standards is February 1, 2012 to August 24, 2014.

The Lacandón - Forests for Life REDD+ Project focuses on reducing deforestation in Sierra del Lacandón National Park (SLNP) to ensure that ecosystem services continue over time, cultural and archaeological heritage is preserved and the emission of greenhouse gases from deforestation and degradation is avoided. In addition, the project focuses on improving the living conditions of the communities located within and surrounding the park boundaries.

The Sierra del Lacandón National Park is one of the seven nuclei of the Mayan Biosphere Reserve (MBR), which represents almost 20% of the land area of Guatemala and about 60% of the area of the Guatemala System of Natural Protected Areas. The SLNP is the second largest National Park in Guatemala and it has been characterized, along with the Mirador-Rio Azul National Park, as the region of greatest plant diversity within the MBR. Within the borders of the SLNP there are at least 29 archaeological sites from the Mayan Civilization, including the monumental city of Piedras Negras.

The presence of species listed as endangered by the International Union for Conservation of Nature (IUCN) and included on the Red List have been documented in the park. These species include Jaguar - *Panthera onca* (Near Threatened), Tapir - *Tapirus bairdii* (Endangered) and White-lipped peccary - *Tayassu pecari* (Vulnerable) for fauna and cedar - *Cedrela odorata* (Vulnerable) and mahogany - *Swietenia macrophylla* (Vulnerable) for flora.

G1.2 The results of the monitoring period 2012 - 2014, show that in the community section, twenty (20) workshops on forest fires have been developed, in San Juan Villa Nueva, Poza Azul, Pital, Villa Hermosa, Settlement La Revancha, Unión Maya Itzá, La Lucha, Nueva Jerusalén II and the Military detachment, and fourteen (14) workshops on production and environmental education were held. The educational training provided struck a balance between, among other subjects, awareness of forest conservation and management of water and waste.

The microcredit program, strengthening local capacity and empowering women, has benefited thirteen (13) participants. In addition, forty (40) workshops on community organization and thirty-one (31) health workshops were conducted.

As for biodiversity, the control and surveillance program (between National Council for Protected Areas - CONAP, FDN, Army and Division of Nature Protection - DIPRONA) performed 768 patrols to report any illegal activity in the park. The camera traps were used to monitor the key animals species considered indicators of the state of the forest.

Climate benefits are reflected in the reduction of deforestation. The tradable VCUs for the monitoring period are 369,982.0 tCO₂-e.

1.2 Project Location

G1.3 Reference region

Guatemala is divided into five specific regions with similar physical, social and economic characteristics (Figure 1). These are regions with different deforestation, landscape, ecosystem, economic and socio-cultural conditions and dynamics. The reference region for this project corresponds to the sub-national region “Tierras Bajas del Norte” (Northern Lowlands), which covers the entire department of Petén and portions of the departments of Huehuetenango, Quiché, Alta Verapaz and Izabal. Northern Lowlands presents the largest extensions of remaining forest in Guatemala, and also presents the highest level of deforestation.

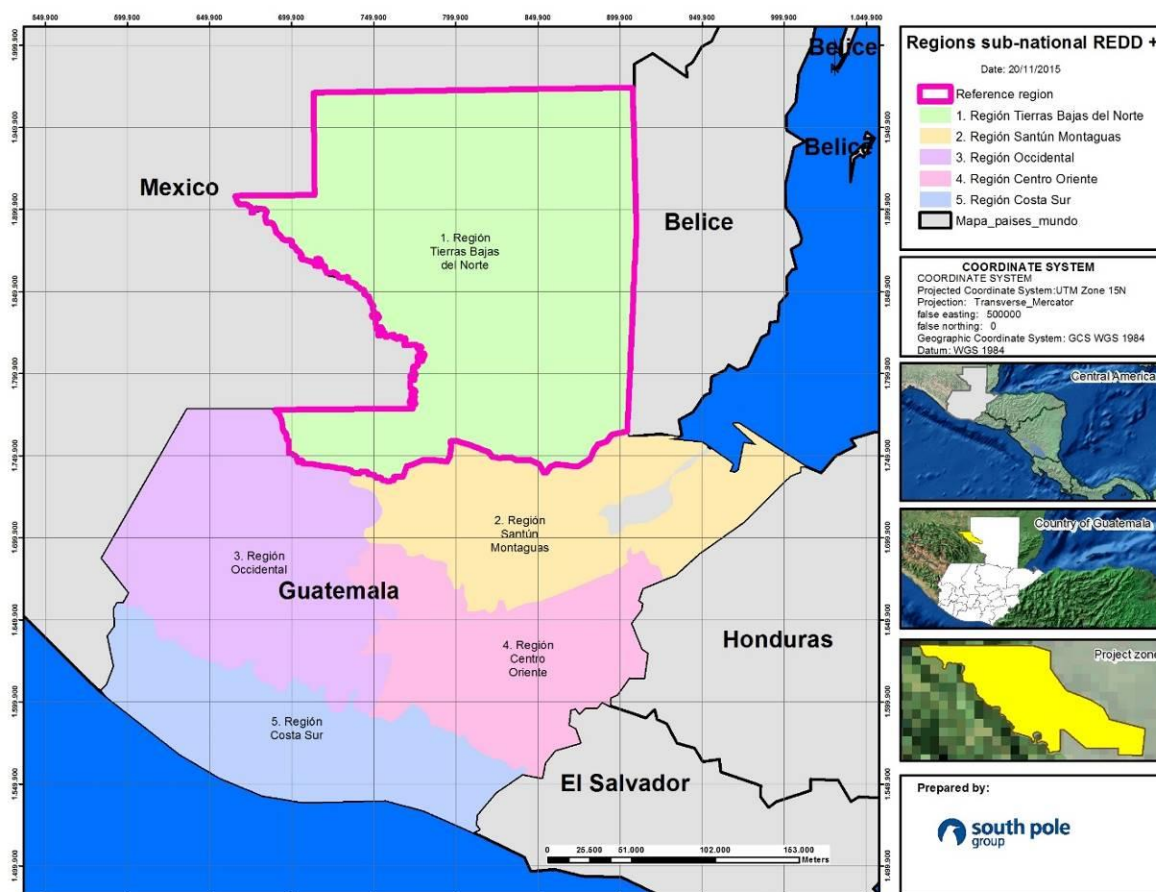


Figure 1 Guatemala sub-national regions.

This region has the highest proportion of forest in the country (57% of the total) and the highest deforestation from 1990 to 2000 (43% of the total). The dynamics of deforestation are influenced by altitude and topographical characteristics.

The reference region is located in the terrestrial ecoregion denominated as “Petén-Veracruz moist forest”. This ecoregion is considered to be the most extensive wooded tropical formation in Mesoamerica and functions as the natural northern boundary for tropical vegetation. The most significant impacts on this ecoregion are evident in the extensive areas of forests that have disappeared, mainly due to agriculture and livestock raising activities¹².

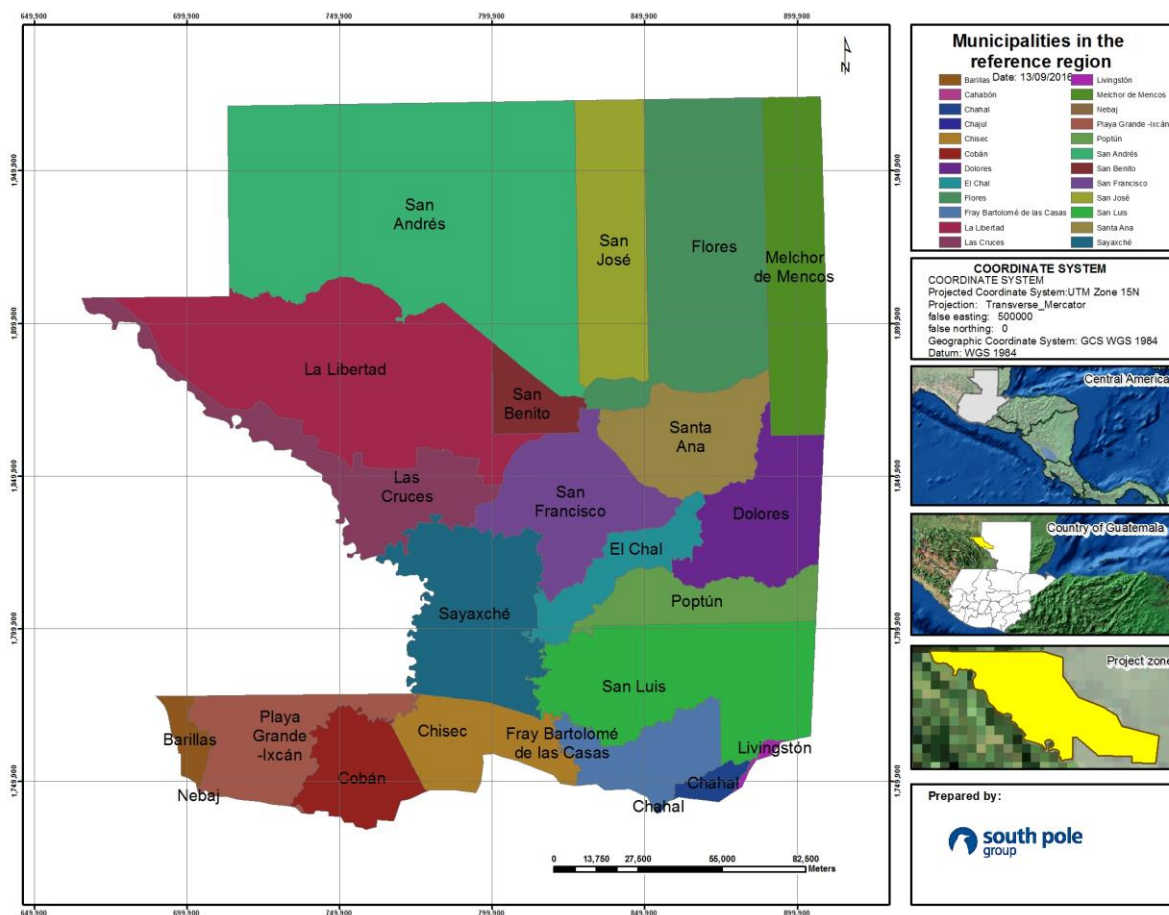


Figure 2 Municipalities in the Reference Region.

¹ USAID, 2003. Guatemala Biodiversity and Tropical forest Assessment. Available at: http://pdf.usaid.gov/pdf_docs/Pnadf213.pdf

² Critical Ecosystem Partnership Fund. 2010. Assessing Five Years of CEPF Investment in the Mesoamerica Biodiversity Hotspot. A Special Report. Available at: http://www.cepf.net/Documents/Final_NMesoamerica_Assessment_Jan2010.pdf

Project Zone

G1.4 The Lacandón REDD+ Project is located in the northwest of Petén Department in Guatemala. The project zone is the total area of the SLNP, where La Lucha cooperative is located, plus the areas of the cooperatives Unión Maya Itzá and La Técnica Agropecuaria, which are located partially and fully outside the National Park area, respectively. The total project zone encompasses 206,268.71 ha.

About half of its boundaries are international border with the Mexican states of Chiapas and Tabasco. The northeast border is the multiple use zone of the MBR, the northern limit is with the state of Tabasco (Mexico), in the west, it is the Usumacinta River natural border with the state of Chiapas (Mexico), and the southern and eastern boundaries are the buffer zone of the MBR within the municipalities of La Libertad and Las Cruces.

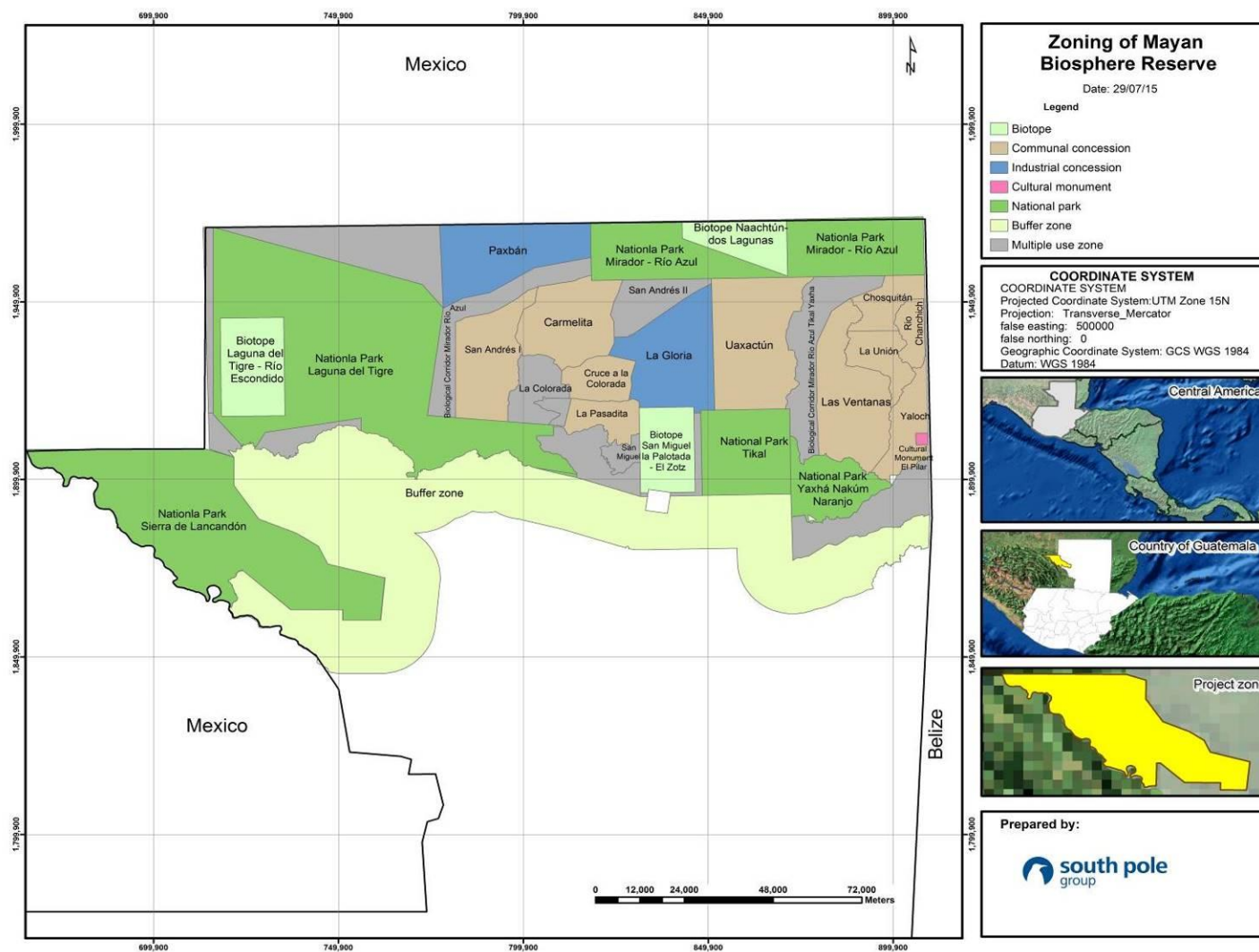


Figure 3 Zoning of Mayan Biosphere Reserve – Location of the National Park Sierra de Lacandón.

Source: Estado de la Reserva de la Biosfera Maya³.

³ State of the Maya Biosphere Reserve. Available at: <http://stateofthembr.org/es-es/mapas.aspx>

Project Area – First instance

G1.4 According to the methodology VM0015 used for this project, the project area is the area of forest within a given region. For the project first (I) instance, the project area corresponds to the total forest area of Unión Maya Itzá, La Técnica Agropecuaria and La Lucha cooperatives, all with legal land tenure, and the private properties of Fundación Defensores de la Naturaleza, Naranjitos and Centro Campesino areas. The total project area for the first instance is 45,288.81 ha.

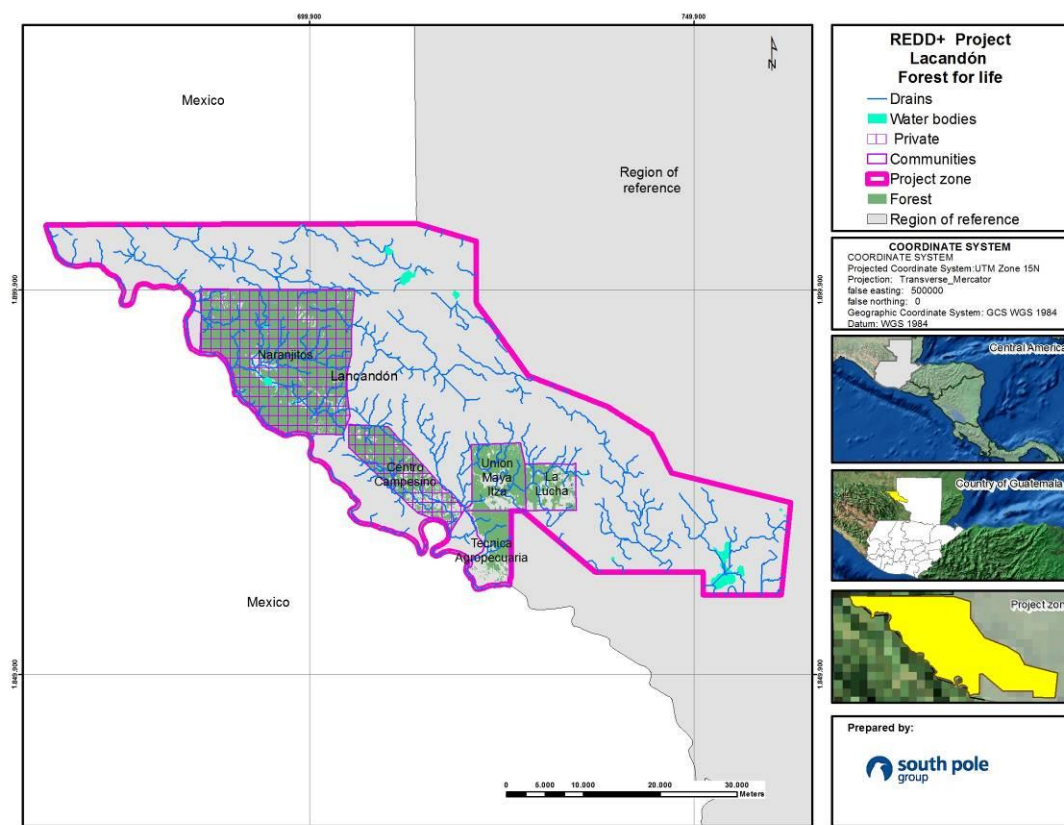


Figure 4 First instance project area.

Table 1 Geodetic central coordinates.

Cooperative (C) / Private property of FDN	Map area (ha)	Centroid coordinates			
		UTM coordinates		Geographic coordinates	
		X	Y	X	Y
La Técnica Agropecuaria (C)	4,642.03	723,634.36	1,866,217.55	-90.90	16.87
Unión Maya Itza (C)	6,068.24	724,404.11	1,875,457.29	-90.89	16.95
La Lucha (C)	3,974.03	731,252.31	1,874,259.56	-90.83	16.94
Private Property					
Centro Campesino – FDN	8,392.72	712,185.22	1,876,092.83	-91.01	16.96
Naranjitos - FDN	30,807.2	696,651.53	1,891,676.93	-91.15	17.10
Total	53,884.22				

1.2.1 Project physical parameters

G1.3 The country is part of an isthmus and is located in a highly geologically vulnerable region. It is situated between three intercontinental plates, with resulting geomorphological and hydric characteristics. It is located in an intertropical convergence zone, between the Atlantic and Pacific Ocean, and in the zone of influence of El Niño and La Niña phenomena. It lies in the path of hurricanes and tropical storms in the Caribbean, making it a vulnerable and fragile country. The impact related to climate variability in Guatemala has an effect of 1.3% to 3.7% annually in Gross Domestic Product (GDP) and it is estimated that between 40% and 70% of this impact is in the agricultural sector⁴.

Life zone

According to the Holdridge classification, two different life zones occur in the Park. The Subtropical humid forest “bh-S(c)”, at 197,746.27 ha, is the most widely represented of the two, and the Subtropical very humid forest “bmh-S(c)”, at 2,449.37 ha, is very scarcely represented. The Subtropical humid forests receive high overall rainfall with a warm summer wet season and a cooler winter dry season. Some trees in these forests drop some or all of their leaves during the winter dry season. According to previous classifications⁵, the SLNP contains nine different terrestrial ecosystems and two different aquatic ecosystems. The most represented ecosystems correspond to dense humid broadleaved lowland forests, humid broadleaved forest of the hills, and bushy areas with broadleaved trees.

Climate

The climate of the Sierra del Lacandón is particular in its high rainfall as compared to the rest of the RBM. It has record minimum annual rainfall of 1,481 mm (1968) and a maximum of 2,527 mm (1981).

The project area presents hot sub-tropical climate. The rainy season usually occurs during May to December, while the months of January until May are dry. The temperatures reach an average maximum of 40.1 °C and a minimum average of 14 °C. The overall average temperature is 25.9 °C. The annual average humidity is 85.5%, and the average precipitation is 1600.6 mm⁶.

⁴ Gobierno de Guatemala. 2015. Contribución prevista y determinada a nivel nacional. Ministerio de Ambiente y Recursos Naturales. Disponible en: <http://www4.unfccc.int/submissions/INDC/Published%20Documents/Guatemala/1/Gobierno%20de%20Guatemala%20INDC-UNFCCC%20Sept%202015.pdf>

⁵ INAB. 2001. “Mapa de Ecosistemas Vegetales de Guatemala; Memoria Técnica”. Instituto Nacional de Bosques (INAB). Guatemala. 39 pp. + anexos.

⁶ Data INSIVUMEH Bethel Station, 2009

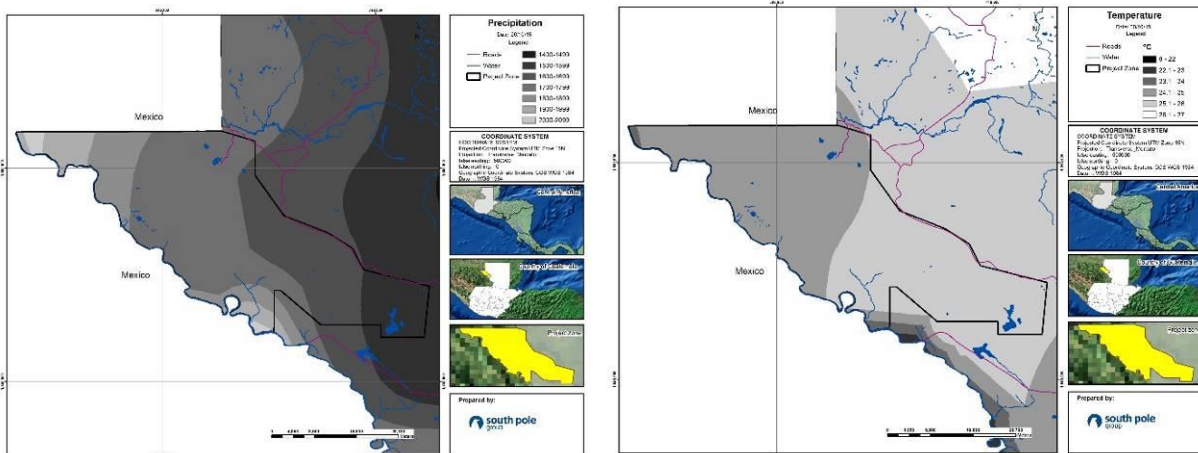


Figure 5 Precipitation and Temperature in the project zone.

Geology

Guatemalan geology is characterized by the presence of active volcanoes, rugged terrain in the central cordillera, transform faulting, northern lowlands and extensive karst topography. Soils in the Department of Petén are mainly formed by alluvium from the Quaternary, Eocene, Paleocene-Eocene and Cretaceous Eras. In the northern lowlands of Petén and the central Alta Verapaz regions of Guatemala, the upper portion of the “Todos Santos” Formation includes interbedded carbonates and evaporites, merging in places with overlying Cretaceous carbonates.

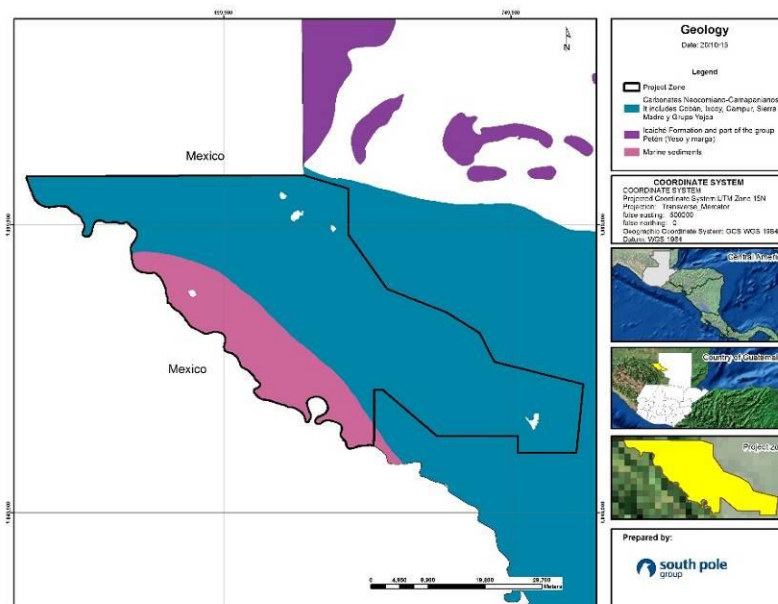


Figure 6 Geology in the project zone.

Physiography and soils

According to physiographic studies developed previously in the area⁷, the main origin of the geologic strata present in the project area is of limestone and dolomitic precedence. The associated topography consists of karstic formations with an incomplete and broken up drainage network.

Within the SLNP, four main landscapes exist. The most representative is the karstic mountains of Sierra de la Pita, Sierra del Lacandón and Sierra de la Ribera and the alluvial plains of the El Repasto and the Yaxchilan that are between the mountain ranges.

The soils present in the area correspond to formations presenting Rendzinas/Litosols/Cambisols or Rendzinas/Cambisoles/Vertisoles.

Table 2 Types of soils in the SLNP.

Type of soils	% of area within SLNP	Description
Rendzinas/Litosoles/Cambisoles (Series Chacalté - Cuxu)	65%	Parent material of limestone (hard and soft), cracked relief with slopes of average 50% grade and very high risk of erosion, with good internal drainage and relatively high fertility.
Rendzinas/Cambisoles/Vertisoles (Quinil - Yaxhá - Chapayal - Uaxactún)	30%	They are located in the inter-mountain areas of the "Serranía". Plain, relief of 0-30% gradient, parent material of limestone, with varying internal drainage, less danger of erosion and higher fertility than the Chacalté - Cuxu series.
Gleysols	3%	Associated with scattered small wetlands and swamps located in SLNP (El Repasto Lagoon, Laguneta Lacandon, etc.). Usually formed by unconsolidated sediments and flood events.
Cambisoles Gleicos/ Gleysols (seria Bolom)	2%	Associated with the floodplains east of Parcelamiento Retalteco. Similar characteristics to Gleysols.

Source: APESA, 1993.

Within the SLNP 4 large landscapes are recorded, the most represented being Lacandón karst mountain (representing 72% of SLNP) and colluvial sedimentary plain of Yaxchilán-El Subín-Machaquila (22% of SLNP).

⁷ Alvarado, G. y Herrera, I. 2000. Mapa Fisiográfico-Geomorfológico de la República De Guatemala Escala 1:250000. Unidad de Políticas e Información Estratégica (UPIE), Área de Planificación, Ministerio de Agricultura, Ganadería y Alimentación, Guatemala. Available at http://web.maga.gob.gt/wp-content/blogs.dir/13/files/2013/widget/public/mapa_fisiografia_memoria_2001.pdf

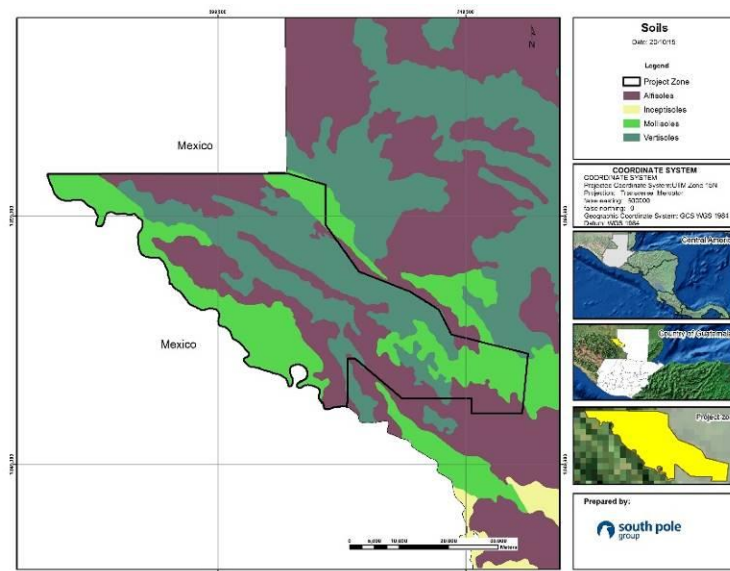


Figure 7 Types of soil in the project zone.

Topography

Topographically, the SLNP can be divided into two major categories: Mountainous areas and lowland areas.

- Mountainous areas or “Serranías”: The mountains are formed by a series of hills through the National Park that strike in a southeast-northwest direction, parallel to the course of Usumacinta River. There are three “serranías” in the NPSL: Sierra de la Ribera, Sierra del Lacandón and Sierra La Pita.
- Lowland areas or low seasonally flooded: distributed within the SLNP with a longitudinal axis running northwest-southeast between the mountains or “sierras” of La Ribera and Lacandón⁸.

Hydrology

The most representative in terms of its extent in the National Park is the Usumacinta River watershed, covering around 161,614 ha, some 81% of the National Park area. It is also significant at a social/administrative and political level, since its flow is the natural feature delimiting the border with the Mexican states of Chiapas and Tabasco.

The most important water courses flowing into the Usumacinta River are the Yaxchilán and the Macabiero Rivers. On the borders of the river are established several human settlements and communities such as La Lucha, Union Maya Itzá and La Técnica Agropecuaria. The Yaxchilán River drains the South West part of the Park and the Macabiero River drains the plains of the region between Sierra de La Ribera and Sierra del Lacandón. The last one presents scarce human disturbance.

⁸ CONAP. 2005. Plan Maestro 2006 – 2010. Parque Nacional Sierra del Lacandón.

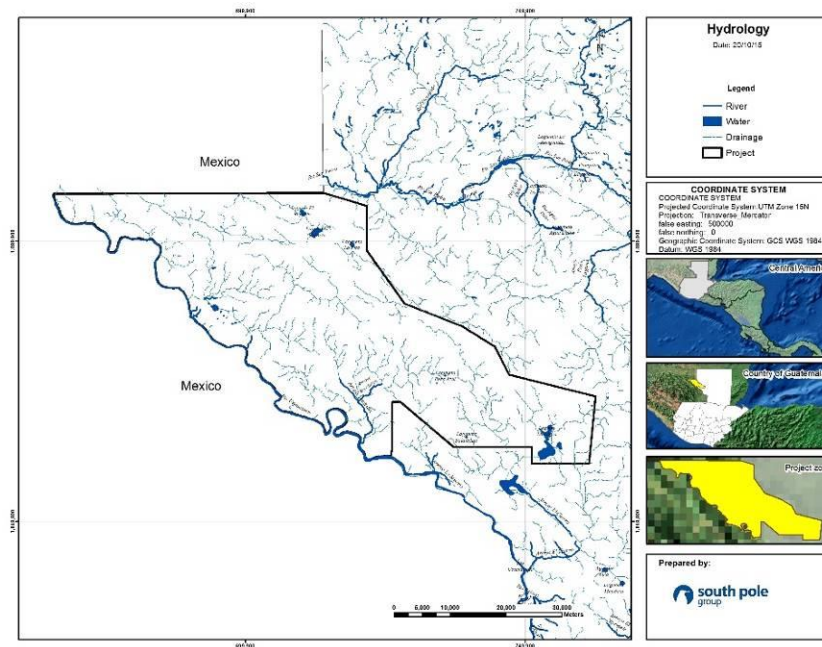


Figure 8 Hydrology in the project zone.

1.2.2 Land Use

The natural resources of the Department of Petén have been under severe pressure by processes of colonization together with public policies to incentivize land use change from forest to extensive agriculture and livestock raising. Furthermore, cultural and archaeological richness in the department has been a cause for looting and chaotic exploitation of these goods.

The causes of forest loss, which are manifold, must be addressed, including:

- Owners of large and medium farms clear forests for new pasture for cattle ranching.
- Existing communities expand their farming lands (unsustainable livestock) using shifting cultivation and slash and burn agriculture.
- Illegal activities of loggers, illegal new settlements and illegal sales of land.
- Illicit activities that help create a difficult situation to govern (traffic of persons and of substances).
- Forest fires: Slash and burn practices intended to prepare land for agricultural use are common. However, fires often spread to the bordering lands and become difficult to control.
- The extraction of natural resources, mainly for wood, xate and hunting.

The SLNP has a total area of 202,865 hectares. Some 95,529 hectares are forests that have been well preserved, and another 54,000 hectares are currently being regenerated. More than 28,000 hectares of this forest area were lost between 1986 and 2009, which is an average of 1,240 hectares each year.

The main threats affecting conservation of biodiversity in the SLNP are forest fires, the advancing agricultural frontier, deforestation, illegal traffic, human settlement, extraction of timber and non-timber forest products, and fishing.

It is a critical conservation area due to the massive colonization and population growth in recent years, which have caused major changes in land use with the intention of generating economic opportunity by converting forest to farming and livestock areas.

The farming activities have been limited by topography, but degradation is evident in the lowlands abutting the road. Agricultural activities in the area, where uncontrolled, include the use of slash and burn (a technique to prepare land that will be used in planting crops or pasture and even future settlement), which is the main cause of wildfires affecting large areas of forest that would not necessarily otherwise be converted for agriculture and cattle raising activities.

Table 3 Description of the variables of the deforestation system in the SLNP.

N°	Variable	Description
1	Access to the area	Primary and secondary roads that allow entry to areas under forest cover.
2	Migration	Groups of people arriving at Petén department from other departments of Guatemala.
3	Institutional presence	Governmental and non-governmental organizations related to environmental protection and compliance with environmental legislation in the country.
4	Forest fires	Unplanned and uncontrolled forest fires. Require intervention to control.
5	Population growth	Average annual rate of change in population size for a particular territory or geographic area.
6	Economic alternatives	Family productive activities that generate income to cover basic needs. They are not linked to traditional farming and extensive cattle ranching.
7	Water bodies	Bodies like rivers, lakes, lagoons that store volumes of water, which can be extracted superficially.
8	Areas suitable for farming	Areas within the SLNP with conditions favorable for the development of agriculture (climate, soil type, slope, access to water).
9	Human settlements	Establishment of a demographic conglomerate in an area physically located.
10	Health and education	Access to basic services.
11	Areas suitable for livestock	Areas within the SLNP with conditions favorable for the development of livestock practices (climate, soil type, slope, access to water).

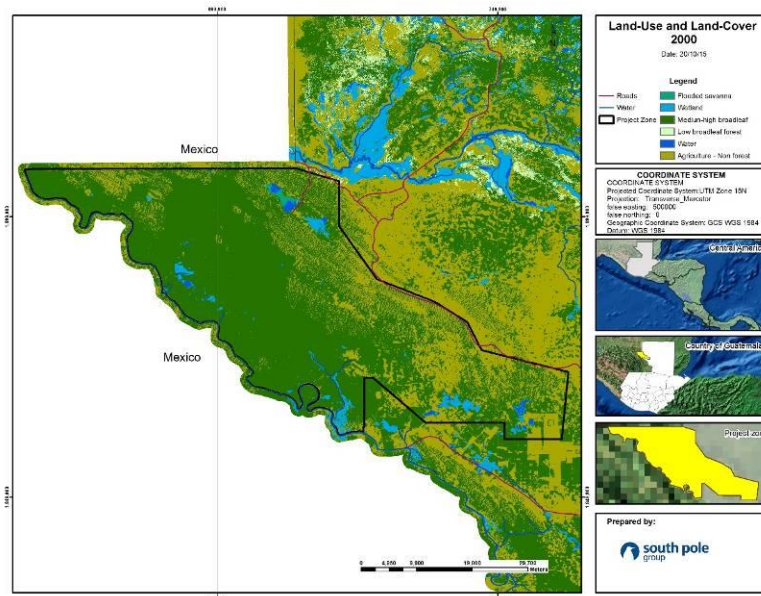


Figure 9 Land use and land cover of the project zone –2000.

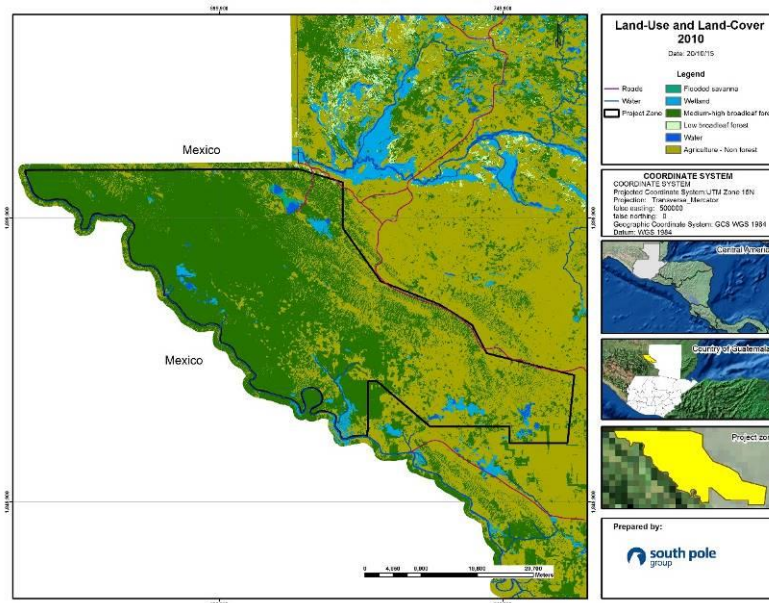


Figure 10 Land use and land cover of the project zone –2010.

1.2.3 Ecosystems

The project considers a sub-division of the broadleaved forest ecosystems, based on their biomass contents. The classification results in the following sub-classes of broadleaved forests:

- Sub-humid broadleaved lowland forest
- Sub-humid broadleaved middle-high forests
- Humid broadleaved middle-high forest
- Sustainably managed sub-humid broadleaved lowland forest
- Sustainably managed sub-humid broadleaved middle-high forests
- Non-sustainably managed sub-humid broadleaved lowland forest
- Non-sustainably managed sub-humid broadleaved middle-high forests.

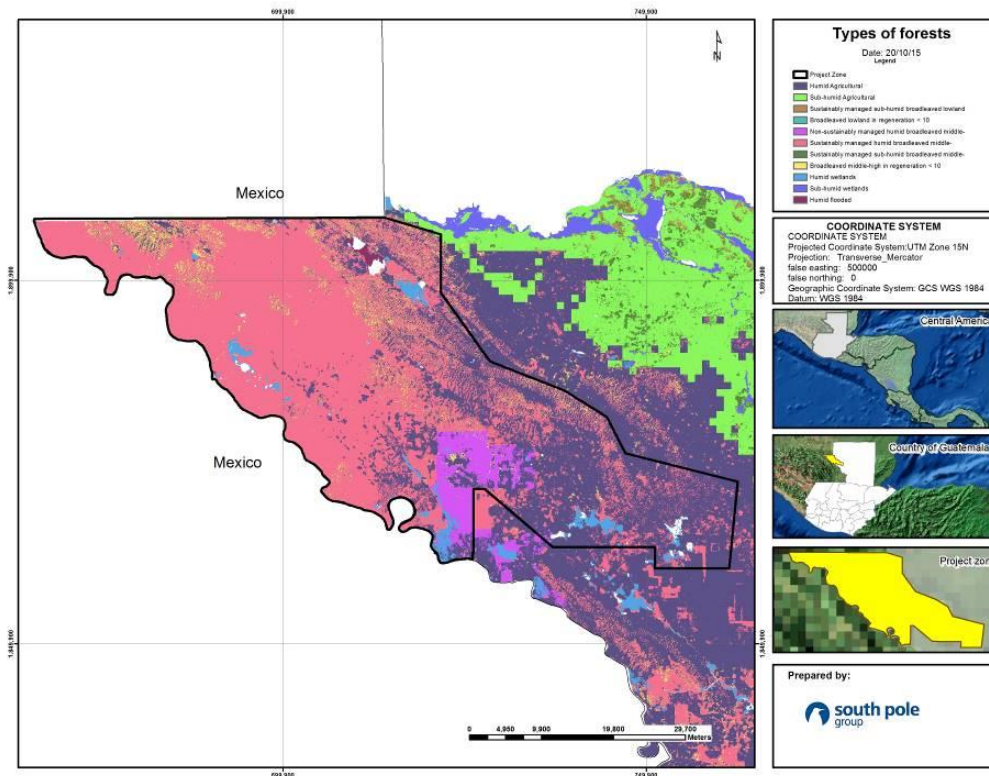


Figure 11 Types of forest in the project zone.

1.2.4 Flora

Since much of the Petén is not well known botanically, it is difficult to estimate the number of vascular plants or endemics. The floristic diversity of the Maya Biologic Reserve is considered exceptional, with over 3,000 plant species⁹. The overall region's flora is considered distinctive; many of the Petén's regionally endemic taxa are shared to varying extents with northern Belize and the majority of Mexico's Yucatán Peninsula to eastern Tabasco and the eastern highlands of Chiapas^{10 11}. Most local Petén endemics have been found in areas that allow for little human intervention, such as steep hills and swamps.

The vegetation includes 138 tree species, 122 epiphytes and four species that are entirely aquatic. Morales and Flores (2001) pointed out that scientists may still discover new types of vegetation due to this area's vastness, biodiversity, and wealth of natural resources.

In the areas of the sinkholes, 338 plant species belonging to 70 families were found. The most diverse families are Orchidaceae, Bromeliaceae, Araceae and Rubiaceae. As for the vertical distribution, the stratum with the highest species richness was the arboreal stratum with 139 species, followed by the epiphytic and shrub groups with 122 and 30 species, respectively.

The species most characteristic and frequently encountered in the upper strata of high evergreen forest trees are Ramon (*Brosimum alicastrum*), chechén negro (*Metopium brownei*) and zapotillo (*Pouteria* sp.). In the valleys, Santa María (*Calophyllum brasilense*) and chicozapote (*Manilkara achras*) can be found. In the mountains, Serranía (local name) (*Alseis yucatanensis*), sufricay (*Rollinia microcephala*) and cedrillo de hoja ancha (*Guarea excelsa*) are abundant. The underwood of the highest and shady areas may contain an abundance of palms like corozo (*Orbignya cohune*), guano (*Sabal morrisiana*), xate (*Chamaedorea* sp.) and bayal (*Desmoncus ferox*).

1.2.5 Fauna

A significant portion of the fauna can be found in the lists of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), including the jaguar (*Panthera onca*), puma (*Puma concolor*), ocelot (*Leopardus pardalis*), margay (*Leopardus wiedii*), tapir (*Tapirus bairdii*), anteater (*Tamandua mexicana*), spider monkey (*Ateles geoffroyi*), harpy eagle (*Harpia harpyja*), scarlet macaw (*Ara macao cyanoptera*) and crocodile (*Crocodylus moreletii*). There are also species such as tepezcuintle (*Agouti paca*), collared peccary (*Pecari tajacu*), white-tailed deer (*Odocoileus virginianus*), goat (*Mazama temama*) iguana (*Iguana iguana*) and turtle (*Dermatemys mawii*). Within the SLNP, studies have been conducted of birds, fish, reptiles, amphibians and mammals (Refer to Annex of the PDD for a complete list).

⁹ CONAP (1992). Plan maestro de la Reserva de la Biósfera Maya RBM. CONAP, Guatemala City. 25 pp., cited in an online article of the Department of Botany of the Smithsonian National Museum of Natural History, available at <http://botany.si.edu/projects/cpd/ma/ma13.htm>

¹⁰ Breedlove, D.E. (1981). Introduction to the Flora of Chiapas. In Breedlove, D.E. (ed.), Flora of Chiapas. Part 1. California Academy of Sciences, San Francisco. 35 pp., cited in an online article of the Department of Botany of the Smithsonian National Museum of Natural History, available at <http://botany.si.edu/projects/cpd/ma/ma13.htm>

¹¹ Wendt, T. (1993). Composition, floristic affinities, and origins of the canopy tree flora of the Mexican Atlantic slope rain forests. In Ramamoorthy, T.P., Bye, R., Lot, A. and Fa, J.E. (eds), Biological diversity of Mexico: origins and distribution. Oxford University Press, London. Pp. 595-680., cited in an online article of the Department of Botany of the Smithsonian National Museum of Natural History, available at <http://botany.si.edu/projects/cpd/ma/ma13.htm>

Table 4 Endangered species within SLNP

Latin name	English name	Spanish name	Status on the IUCN Red List
<i>Crocodylus moreletii</i>	Morelet's Crocodile	Cocodrilo negro	Least Concern
<i>Crax rubra</i>	Great Curassow	Pajuil, pavón, Faisán	Vulnerable
<i>Electron carinatum</i>	Keel-billed Motmot	Momoto piquianillado	Vulnerable
<i>Eleutherodactylus leprus</i>		Rana	Vulnerable
<i>Megalops atlanticus</i>	Tarpon	Sábalo	Vulnerable
<i>Agamia agami</i>		Garza	Vulnerable
<i>Alouatta pigra</i>	Yucatán Black Howler Monkey	Saraguate	Endangered
<i>Ateles geoffroyi</i>	Geoffroy's Spider Monkey	Mono araña	Endangered
<i>Balantiopteryx io</i>	Thomas's Sac-winged Bat	Murcielago	Vulnerable
<i>Craugastor alfredi</i>		Rana	Vulnerable
<i>Cryptotis griseoventris</i>	Guatamalan Small Eared Shrew	Musaraña	Vulnerable
<i>Myrmecophaga tridactyla</i>	Giant Anteater	Oso hormiguero gigante	Vulnerable
<i>Tapirus bairdii</i>	Baird's Tapir	Tapir, danta	Endangered
<i>Tayassu pecari</i>	White-lipped peccary	Pecari Labio Blanco	Vulnerable
<i>Cedrela odorata</i>	Spanish Cedar	Cedro	Vulnerable
<i>Swietenia macrophylla</i>	Large-leaved Mahogany	Caoba	Vulnerable

1.2.6 High Conservation Value

G1.7 / CM1.2 / B1.2 The project zone includes areas of High Conservation Value (HCV). The HCV characteristics have been identified using Geographic Information Systems and management plans for sustainable use of the principal species such as Spanish Cedar, Large-leaved Mahogany, Breadnut and Allspice. Each owner has identified and defined their areas and indicated if they have archaeological features.

- The area contains globally, regionally or nationally significant concentrations of biodiversity, as clearly exposed by the status of IUCN red list regarding some of the species present in the project zone. CONAP has developed Guatemala's National Council of Protected Areas' Red List and described many of the species present in the project zone¹²;

¹² CONAP, 2001b. Listado de especies de fauna y flora silvestre amenazadas de extinción (Lista Roja de Flora). Resolución ALC 028-2001 del Consejo Nacional de Áreas Protegidas. Guatemala. Available at: [http://www.google.ch/url?sa=t&rct=j&q=listado%20de%20especies%20de%20flora%20silvestre%20amenazadas%20de%20extinci%C3%B3n%20\(lista%20roja%20de%20flora\).%20resoluci%C3%B3n%20alc%20028-2001%20del%20consejo%20nacional%20de%20%C3%A1reas%20protegidas&source=web&cd=1&ved=0CDIQFjAA&url=http%3A%2F%2Fwww.chmguatemala.gob.gt%2Fcoleccion%2Fespecies-](http://www.google.ch/url?sa=t&rct=j&q=listado%20de%20especies%20de%20flora%20silvestre%20amenazadas%20de%20extinci%C3%B3n%20(lista%20roja%20de%20flora).%20resoluci%C3%B3n%20alc%20028-2001%20del%20consejo%20nacional%20de%20%C3%A1reas%20protegidas&source=web&cd=1&ved=0CDIQFjAA&url=http%3A%2F%2Fwww.chmguatemala.gob.gt%2Fcoleccion%2Fespecies-)

- Protected areas. The SLNP is considered as a legally protected area equivalent to IUCN Protected Area Management Category II.
- *Tapirus bairdii*, *Tayassu pecari* and *Panthera onca* are considered endangered species by IUCN.
- Several publications¹³¹⁴ show that the SLNP together with the Mexican Sierra Lacandona is a crucial area for the conservation of endemic species of birds, mosses, to the region. Moreover, a scientific publication¹⁵ presents the project zone as a Pleistocene refuge, based on evidence for centers of endemism and the distribution of endemic species.
- Regionally or nationally significant at the large landscape-level: The Jaguar (*Panthera onca*) plays a very important role in the balance of ecosystems. In different monitoring reports, most were recorded in very specific areas, areas near the Usumacinta river and near to Piedras Negras archaeological site. Therefore, it can be deduced that the occupation of the jaguar is defined by the type and quality of habitat preferred by the species, making it more vulnerable to anthropogenic and environmental pressures.
- The unexplored sinkholes (water ecosystem service) present in the project area could represent an opportunity for discovering threatened or rare ecosystems;
- The project zone is fundamental for meeting the basic needs of local communities and is critical for the traditional cultural identity of communities since most of the areas present high cultural, ecological, economic and religious significance for the local communities.

Therefore, the HCVs identified in the project zone are:

- HCV1: Concentrations of biological diversity including endemic species, and rare, threatened or endangered species.
- HCV5: Sites and resources fundamental for satisfying the basic necessities of local communities or indigenous people.
- HCV6: Sites, resources, habitats and landscapes of global or national cultural, archaeological or historical significance, and/or critical cultural, ecological, economic or religious/sacred importance for the traditional cultures of local communities or indigenous people.

Many species on the verge of extinction are listed on the CITES lists (Convention on International Trade in Endangered Species of Wild Fauna and Flora) and the List of Threatened Species (*Lista de Especies Amenazadas*, or LEA) maintained by CONAP. There are a variety of important species such as the Jaguar, White-lipped peccary and Tapir, which have a high biological relevance for maintaining the ecological balance of the ecosystems where they live (ecological niche). They have a large area requirement, so preserving them indirectly helps to preserve other species and habitats.

[endemicas%2FLista%2520Rojas%2520de%2520Fauna.pdf%2Fat_download%2Ffile&ei=0U5CUa-OKer-2QXDgYGoDw&usg=AFOjCNFRuKMtpQ3sd1MfctHRg_CyWwyO4A&bvm=bv.43828540.d.b2I](#)

¹³ Eisermann & Avendaño, 2008. Available at: http://www.partnersinflight.org/pubs/mcallenproc/articles/PIF09_Decision%20Support%20Tools/Eisermann_PIF09.pdf

¹⁴ Delgadillo & Cardenas, 2002. Available at: [http://www.bioone.org/doi/abs/10.1639/0007-2745\(2002\)105%5B0327:TLFCMA%5D2.0.CO%3B2](http://www.bioone.org/doi/abs/10.1639/0007-2745(2002)105%5B0327:TLFCMA%5D2.0.CO%3B2)

¹⁵ Toledo, 1982; Wendt, 1989 and Wendt, 1993, cited in Domínguez-Vazquez et al., 2004. Available at <http://www.sciencedirect.com/science/article/pii/S0034666704000478>

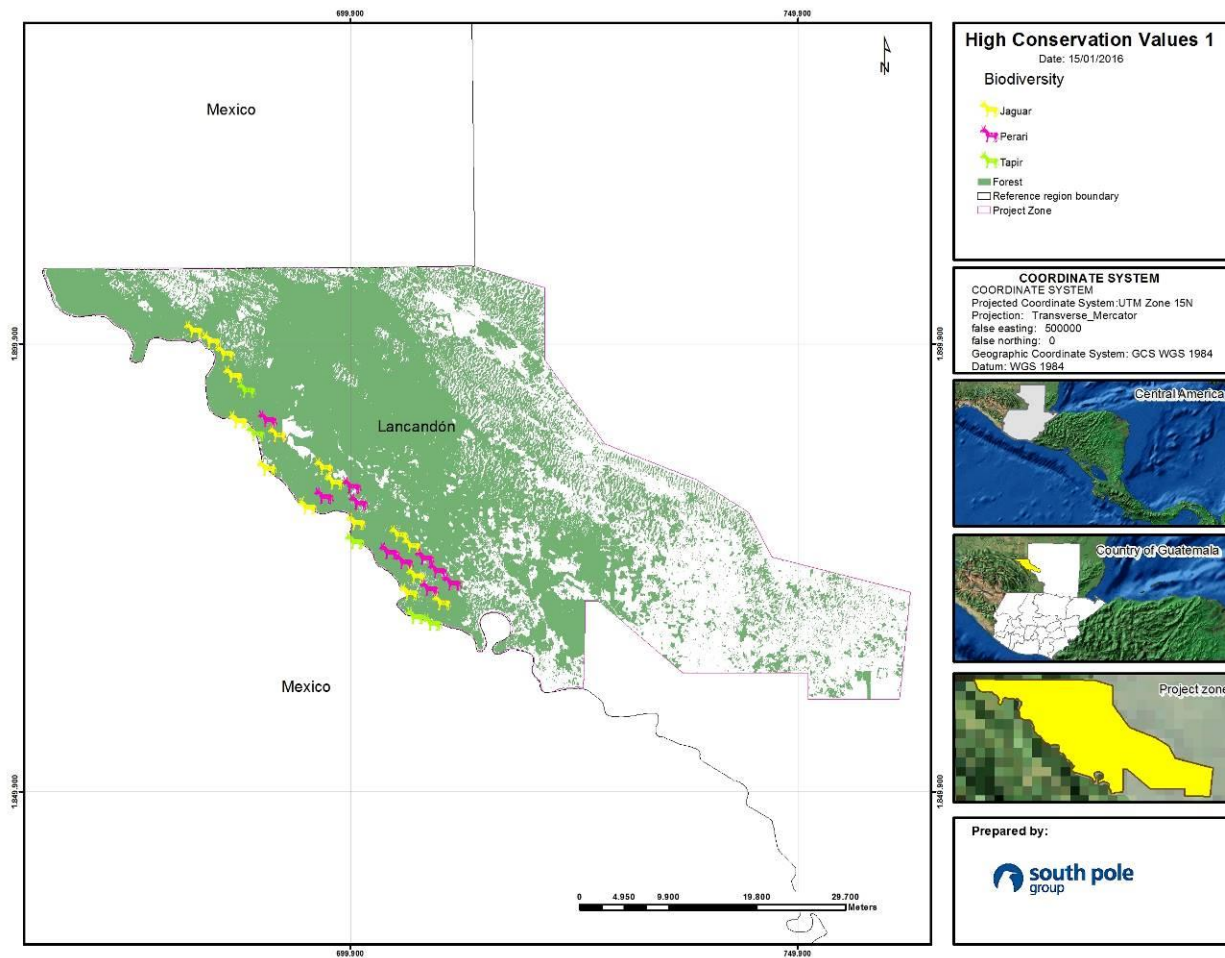


Figure 12 HCV1 – Concentrations of biological diversity / endangered species.



Tapirus bairdii



Panthera onca



*Tayassu pecari*¹⁶

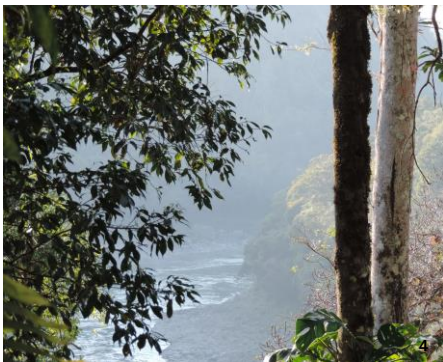
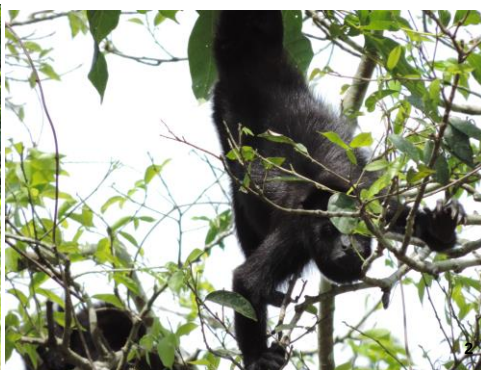


Figure 13 1. Iguana (*Iguana iguana*). 2. Howler monkey. 3. Heliconia 4. Usumacinta River. 5. Totolaca (*Aramus guarauna*) 6. Lacandona Lagoon.

¹⁶ Photos by Defensores de la Naturaleza. Available at <http://www.guatesostenible.com/camaras-de-trampa-revelan-tesoros-animales-en-sierra-de-Lacandón-peten/>

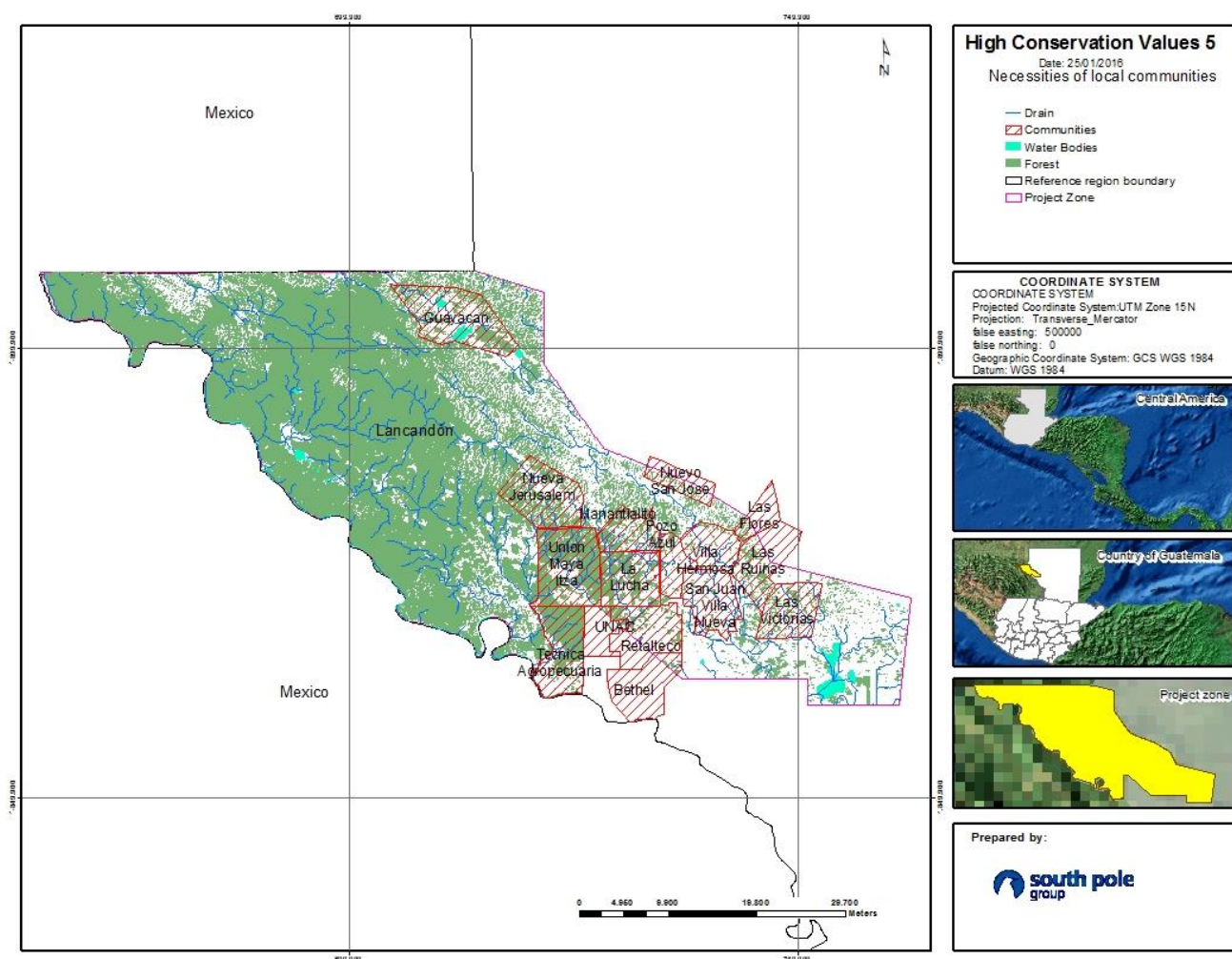


Figure 14 HCV5 - Sites and resources fundamental for satisfying the basic necessities of local communities.



Figure 15 1. Fungus. 2. Malerio seeds (*Aspidosperma megalocarpum*) 3. Family Unit Management Plan. 4. Forest nursery (*Pimenta dioica*). 5. Community gathering Ramon seeds 6. Natural fiber (Pita Floja) 7. Students establishing family gardens.

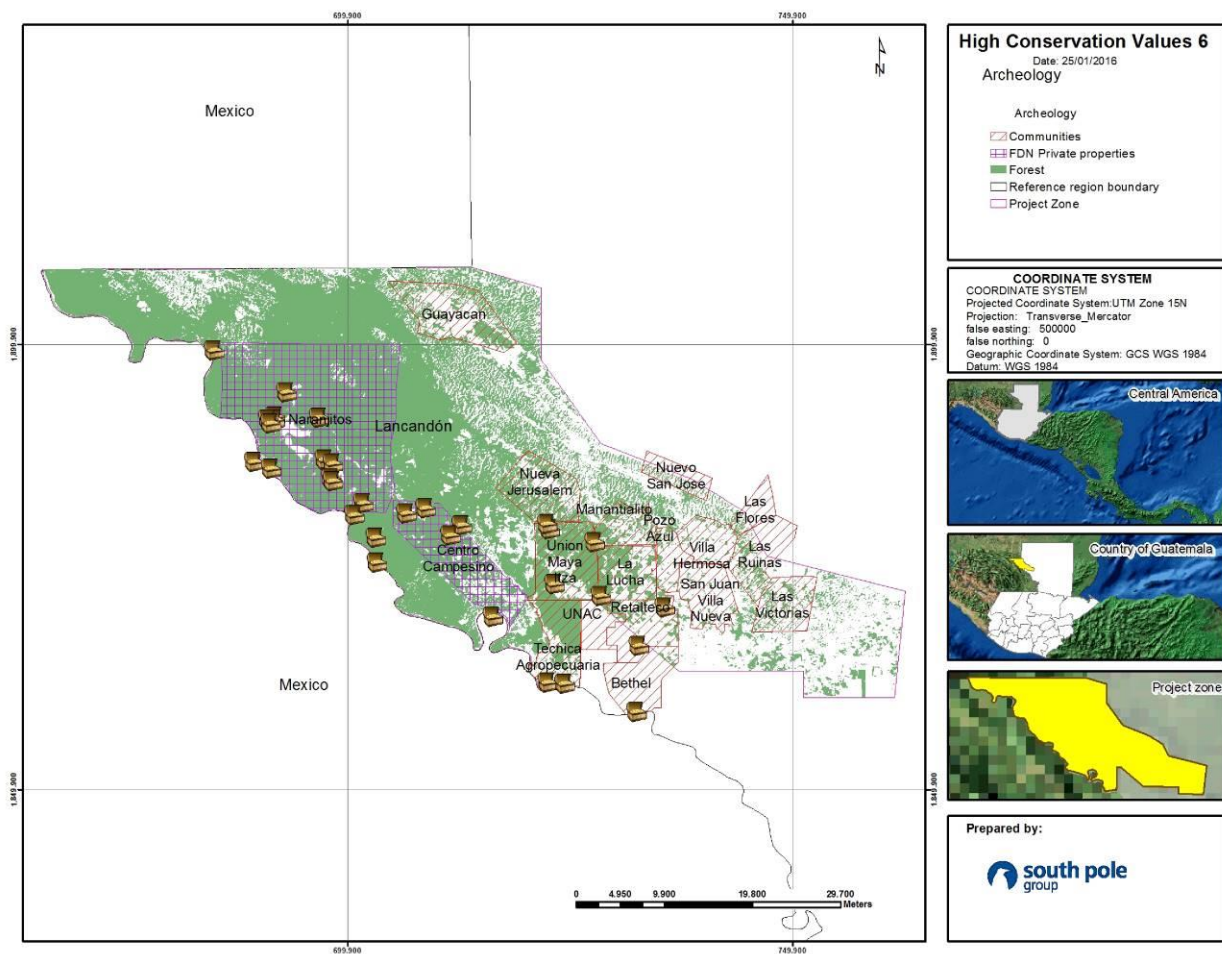


Figure 16 HCV6 - Archaeological significance of the project area.



Figure 17 1-7 Archaeological remains – Piedras Negras Archaeological Park.

1.3 Project Proponent

The project proponents are the Fundación Defensores de la Naturaleza (FDN), owners of Naranjitos and Centro Campesino lands, and the Cooperatives Unión Maya Itzá, La Lucha and La Técnica Agropecuaria, all of them with legal ownership/management rights over their lands.

G1.1 Primary Project Proponent - Fundación Defensores de la Naturaleza is a Guatemalan institution with respected and relevant track records of more than 30 years, having a strong motivation for a long-term involvement in the project. FDN has a formal co-management agreement with CONAP and cooperates in other areas as well with government institutions in order that help apply project experiences with REDD to national processes in Guatemala and adapt project strategies to national development efforts. It also has an extensive track record regarding the management of community-based projects, conservation projects, and integration of socio-economic activities within protected areas, and monitoring of biodiversity and cultural heritage. **Naranjitos and Centro Campesino** are land areas owned by FDN. These private properties were bought by FDN in the late 1990s when they had recently begun working in the SLNP.

La Lucha Cooperative is private property located in the “area of special use” of the SLNP.

La Técnica Agropecuaria Cooperative is a community located in the buffer zone of SLNP. The land is owned by several families that are organized in a cooperative scheme.

Unión Maya Itzá Cooperative is private property located in the “area of special use” within SLNP.

G3.6 / G4.1 The project is managed through the “Project Governance Committee” that meets periodically and in which each entity has a representative with voting rights. The Governance Committee is responsible for the design and implementation of project activities, monitoring and general management of the project on site. The cooperatives participate in the decision-making through representation in the Governance committee and collaborate in the implementation of project activities in joint with FDN.

The committee is composed of one principal representative and one alternate representative from each Cooperative and by FDN, as private owners and project partners. The Governance Committee will be operational for the entire duration of the project.

Some actions of the Governance committee are to approve the annual work plan and any instrument of project planning, build support for the project, define strategies and approval the sale of carbon credits¹⁷.

Community-based REDD projects designed in a pro-poor, pro-biodiversity manner require a lot of different skills and knowledge in order to be successful in the long run. This project has managed to create a team that covers all aspects of the projects with excellent and experienced experts.

The project is managed by an alliance of experienced project partners. Together, the project partners have a successful track record in working with communities and with ecosystem management, including fire management. The project has also a relevant track record with regard to development projects for the carbon markets. Furthermore, the project proponents have the financial capacity to make all necessary initial investment before the project generates any revenue.

¹⁷ For more information, please refer to the folder “Communities agreements”

Name	Address	Role
Fundación Defensores de la Naturaleza	4a. Avenida 23-01 Zona 14 Ciudad de Guatemala Guatemala Contact: Javier Marquez Email: jmarquez@defensores.org.gt Phone (+502) 2310-2929	Fundación Defensores de la Naturaleza¹⁸ is a non-governmental and not-for profit organization that has worked for more than 25 years helping to preserve Guatemala's environmental and cultural values. Defensores de la Naturaleza co-administrates together with CONAP four protected areas of Guatemala, including the SLNP, which has been co-administrated since 1999. FDN will design and implement project activities, monitoring and general management of the project.
Unión Maya Itzá	Las Cruces, Petén, Guatemala Governance committee representative: Juan Carlos Pérez Phone: (+502) 4185-7328	Design and implement project activities, monitoring and general management of the project.
La Lucha	Las Cruces, Petén, Guatemala Governance committee representative: Angel Velarde Phone: (+502) 4908-6978	Design and implement project activities, monitoring and general management of the project.
La Técnica Agropecuaria	Las Cruces, Petén, Guatemala Governance committee representative: Haroldo Ramirez Phone: (+502) 5336-0807	Design and implement project activities, monitoring and general management of the project.

- **G4.2** Forestry Engineer Javier Marquez is Director of Institutional Development at Fundación Defensores de la Naturaleza. His experience at national and international level has allowed the institution to make contact with relevant partners for developing protection projects in Guatemala.
- Agronomy Engineer Edín Lopez is the director of the Sierra del Lacandón National Park and has been directly involved with several projects of social and biodiversity monitoring, measurement of biomass in different types of forests, determination of land tenure, improvement of agricultural practices and payment for environmental services within the SLNP.
- Rebeca Escobar, coordinator of research and monitoring in Sierra del Lacandón National Park.

No new entity has become involved with the project since the validation.

¹⁸ Institutional website. Available at <http://www.defensores.org.gt/>

1.4 Other Entities Involved with the Project

This project has managed to create a team that covers all aspects of the project with excellent and experienced experts. The project is managed by an alliance of experienced project partners. Together, the project partners have a successful track record in working with communities and with ecosystem management, including fire management. The project has also a relevant track record with regard to the development of projects for the carbon markets.

G4.2 OroVerde is a German institution with a long and relevant track record in monitoring the financial management of projects linked to conservation of nature ecosystems. Thus, we consider to be minor the possibility that “internal” or project management risks will lead to project failure.

Name	Address	Role
OroVerde – Die Tropenwaldstiftung Tropical Forest Foundation	Kaiserstraße 185-197 53113 Bonn Phone: 0228/24 29 0 - 0 Fax: 0228/24 29 0 - 55	OroVerde was founded in 1989 by renowned personalities from industry and science. Its work focuses on concrete and permanent effective contributions to the conservation of tropical forests.

- Dr. Elke Mannigel is the team leader for international projects in OroVerde. She has broad experience in ensuring cooperation of different organizations from different countries for reaching conservation goals.

Name	Address	Role
South Pole Carbon Asset Management S.A.S.	Calle 10A # 34-11 Poblado Office 4005 Medellín Colombia Phone: +57 4 352 4428	South Pole Group provides expertise in project development, carbon monitoring and accounting. South Pole is a globally active carbon project developer and consultant, with a successful track record in forest-based carbon projects.

G4.2 South Pole S.A.S belongs to a bigger group of Companies focusing on Environmental Markets. South Pole Asset Management Ltd. has a long and successful track record working on forestry-based carbon projects, including the first forestry VCS project that issued credits in Latin America¹⁹ and the largest REDD+ project to date (in Zimbabwe, Africa)²⁰. South Pole Asset Management Ltd has acted as a

¹⁹ Additional information available at:

<https://vcsprojectdatabase2.apx.com/myModule/Interactive.asp?Tab=Projects&a=1&t=1>

²⁰ Additional information available at:

<https://vcsprojectdatabase2.apx.com/myModule/Interactive.asp?Tab=Projects&a=2&i=902&lat=-16%2E8184067184111&lon=28%2E7615526227228&bp=1>

starting point for founding South Pole S.A.S., so all previous experience and knowledge acquired in the company formed the base for South Pole S.A.S to start its activities. Its expertise covers the key sustainability-related areas of climate change, forests and land use, water, sustainable cities and buildings, as well as renewable energy and energy efficiency.

South Pole Carbon Asset Management Ltd. was elected the Best Project Developer of the Voluntary Carbon Markets in 2011, 2012, 2013, 2014 and 2015²¹.

- Andrea Vera and Victor Giraldo were directly involved in the development of the carbon documentation for the project.

Alliance of entities:

G4.1 The combination of all skills described ensures that the project can be implemented successfully.

CARBON MONITORING AND MEASUREMENT

South Pole oversees the development of appropriate project design and monitoring techniques in line with the guidelines of the CCBS and the VCS.

FDN has an agreement with CEMEC/CONAP, the institution responsible for deforestation and carbon monitoring of Lacandón – Forest for life REDD+ Project.

FDN has a long track record in working with natural resources in the project area. The professionals working for FDN have an average experience of 17 years. Defensores de la Naturaleza's extensive track record includes environmental impact assessments, environmental management mandates, socio-economic, archaeological, and historical assessments.

COMMUNITY ENGAGEMENT

FDN is very experienced in working with communities all over Guatemala. Most of the experience related to the SLNP was gathered during community extension and development work as well as in the investigation undertaken for determining the drivers and agents of deforestation present in the project sub-national region. FDN developed a substantial part of the social assessment in order to determine drivers and agents of deforestation and develop the community monitoring plan.

BIODIVERSITY ASSESSMENT

The project's biodiversity assessment is designed and developed by FDN. FDN has several field teams specialized on biodiversity monitoring and that have already produced relevant results in the past regarding the monitoring of biodiversity in the area. The project include the communities in the process of biodiversity monitoring.

²¹ Additional information available at: <http://www.thesouthpolegroup.com/uploads/media/media-release-southpolegroup-best-project-developer-award-announcement.pdf>

1.5 Project Start Date

G1.9 The project starting date was February 1st, 2012.

1.6 Project Crediting Period

G1.9 The project crediting period is 30 years and 0 months. The start date of the crediting period is February 1, 2012, and the end date is January 31, 2042.

The baseline is reassessed every 10 years after the project start date and during the crediting period and is subsequently validated at the same time as the verification.

All the project proponents will keep working on the protection of the forests in the project zone once the crediting period has expired, and the forests included in the project area will be protected beyond the crediting period.

2 IMPLEMENTATION OF DESIGN

2.1 Sectoral Scope and Project Type

Project scope: Agriculture, Forestry and Other Land Use (AFOLU).

Project category: Reducing Emissions from Deforestation and Degradation (REDD).

Type of activity: Avoided Unplanned Deforestation & Degradation" (AUDD).

Grouped project: Yes. The project will use a programmatic approach where the first instance area is constituted by the cooperatives of La Técnica Agropecuaria, La Lucha, Unión Maya Itza and the private properties of Fundación Defensores de la Naturaleza, Centro Campesino and Naranjitos.

Reference of Methodology: Approved VCS Methodology for Avoided Unplanned Deforestation (VM0015) v1.1

2.2 Description of the Project Activity

G1.8 / G1.9 / GL2.2 The project proponents have defined seven main strategies that will be developed through the implementation of at least one project activity per strategy. The number of project activities considered in each strategy can be expanded in the future, and those already existent can be modified if the project considers this appropriate for more effective achievement of each strategy's goal.

Proposed project activities were implemented during the monitoring period. Table 5 shows the indicators, achievements and impacts monitored. The indicators for each activity are fully developed in sections Community Monitoring and Biodiversity Monitoring respectively.

For see complete description of each project activity strategy, please refer to PDD Section 2.2.

Table 5 Development of project activities.

Strategies / Activities	Indicator	Status	Monitored impact
Strategy 1. Adjustment of land uses and land use rights in communities without land registry.			
Signature and enforcement of cooperation agreements	Negotiation tables	Dialogue and frequent reunions between communities, CONAP and FDN. Significant progress with Manantialito, El Pital, Arroyo Yaxchilan communities. No agreements signed for this monitoring period	Forest conservation / GHG emissions reductions
Strategy 2. Forest protection and biodiversity programs			
Establishment of a program of patrols and surveillance subcommittee for each organization within the park	Control program	768 patrols conducted	Forest conservation / GHG emissions reductions
Workshops about fire management in the communities	Workshops	20 workshops on forest fire management in San Juan Villa Nueva, Poza Azul, Pital, Villa Hermosa, Settlement La Revancha, UMI, La Lucha, Nueva Jerusalem II, Military detachment.	Forest conservation / GHG emissions reductions / Strengthening community capacity
Program for conservation of habitats linked to endangered species and development of a plan for conservation of HCV	Workshops	14 workshops on environmental education and sustainable production	Forest conservation / GHG emissions reductions / Strengthening community capacity
Strategy 3. Sustainable farming and livestock familiar management systems			
School of agroforestry promoters for enhancing practices sustainable agriculture in the communities	Persons trained	11 agroforestry promoters trained	Forest conservation / GHG emissions reductions / Strengthening community capacity
Strategy 4. Diversification and use of communal forestry resources			
Identification of alternative Non Timber Forest Products (NTFPs) and market study on each case	Non-timber management plan	It began with enrichment and reforestation of forest areas in three cooperatives, to add value to existing areas.	Forest and biodiversity conservation / GHG emissions reductions
Development of a census of populations of species of flora/fauna that have historically been subject to commercial extraction and their most common geographical location	Inventory	No data are presented for the monitoring period	Forest and biodiversity conservation / GHG emissions reductions

Strategies / Activities	Indicator	Status	Monitored impact
Development of sustainable forest management plans for small holders and communities.	Forest management plan	1 cooperative (La Lucha) presents Management Plan	Forest and biodiversity conservation / GHG emissions reductions
Establishment and reinforcement of a program of micro-credits and the promotion of conservation and forest management	Number of credits granted	20 women beneficiaries for 2011 – 2012 (first phase) and 13 beneficiaries in 2012 (7 women and 6 men – second phase)	Strengthening community capacity
Strategy 5. Improved management of the SLNP			
Human resources plan focusing on contracting personnel at a fix-basis (not seasonal jobs)	Contract	14 persons with permanent contract for 2014	Forest and biodiversity conservation
Strategy 6. Community dialog, education and capacitation			
Capacity building and governance in REDD	Workshops	Workshops on climate change and REDD projects and assisted events (i.e. COP21)	Forest conservation / GHG emissions reductions / Strengthening community capacity
Strategy 7. Health and welfare of communities			
Workshops about sexual and reproductive health in communities	Workshops	31 lectures on family planning	Forest conservation / GHG emissions reductions / Strengthening community capacity
Workshops water and waste management	Workshops	14 workshops on environmental education and sustainable production	Forest conservation / GHG emissions reductions / Strengthening community capacity

The implementation of project activities is according to the schedule planned in the PDD:

Table 6 Implementation schedule.

Strategies / Activities	Project Lifetime (years)					
	1-5	5-10	10-15	15-20	20-25	25-30
Adjustment of land uses and land use rights in communities without land registry						
Signature and enforcement of cooperation agreements	x	x	x	x	x	x
Forest protection and biodiversity programs						
Establishment of a program of patrols and surveillance subcommittee for each organization within the park		x	x			
Workshops about fire management in the communities	x	x	x	x		
Program for conservation of habitats linked to endangered species and development of a plan for conservation of HCV		x	x	x	x	x
Sustainable farming and livestock familiar management systems						
School of agroforestry promoters for enhancing practices sustainable agriculture in the communities	x	x	x	x	x	x
Diversification and use of communal forestry resources						
Identification of alternative NTFPs and market study on each case	x	x	x	x	x	
Development of a census of populations of species of flora/fauna that have historically been subject to commercial extraction and their most common geographical location		x	x	x	x	x
Development of sustainable forest management plans for small holders and communities.	x	x	x	x	x	x
Establishment and reinforcement of a program of micro-credits and the promotion of conservation and forest management	x	x	x	x	x	x
Improved management of the SLNP						
Human resources plan focusing on contracting personnel permanent (not seasonal jobs)		x	x	x	x	x
Community dialog, education and						

Strategies / Activities	Project Lifetime (years)					
	1-5	5-10	10-15	15-20	20-25	25-30
capacitation						
Community empowerment and capacity building	x	x	x	x	x	x
Health and welfare of communities						
Workshops about sexual and reproductive health in communities	x	x	x	x	x	x
Workshops water and waste management	x	x	x	x	x	x

2.3 Management of Risks to Project Benefits

G1.10 / G1.11 No risks derivative of project activities that affect the climate, community and biodiversity objectives have been registered for the monitoring period. In addition, the project has mitigation measures for any potential risk described in PDD Section 2.3

2.4 Measures to Maintain High Conservation Values

GL1.3 / B2.3 / B2.4 / B4.2

Habitat loss remains the greatest threat to terrestrial biodiversity with deforestation as the main activity. The biological diversity, jaguar (*Panthera onca*), tapir (*Tapirus bairdii*) and white-lipped peccary (*Tayassu pecari*); endangered species included in the IUCN Red List are monitored by camera traps. These species are closely associated with native and primary forest; therefore; conservation strategies are developed to protect the forest and the threatened species.

- Measures for the Area of High Conservation Value 1: Biodiversity and threatened species:
 - Annual monitoring of endangered wildlife and indicator of stable ecosystems.
 - Record of other species in the project zone through camera-traps sampling.
 - Patrols conducted to avoid invasions.
 - Awareness and workshops on forest fires.
 - Control over illegal extraction of natural resources.
 - Generate research and threatened wildlife management.

CM2.2 / CM2.4 / CM4.2 The project area is identified as being of the community-related High Conservation Values 5 (fundamental basic needs) and 6 (cultural identity). The project will not include restriction of access and therefore does not limit the local communities' ability to use the land for their cultural needs, especially for Mayan communities. In terms of fundamental needs, the project follows an incentive-based approach to reduce the use of forest timber and non-timber resources (See Section 7). This implies that a) reduced benefits from not using forest resources are being (over)compensated for and b) forest resources are still available for use by locals.

- Measures for the Area of High Conservation Value 5: Local Basic needs:
 - Support and implement productive projects for local communities.
 - Generate timber and non-timber forest management plans.

- Measures for the Area of High Conservation Value 6: Cultural sites
 - Management and conservation of cultural sites such as Piedras Negras and El Tecolote, under supervision of the Ministry of Culture and Sports - Directorate of Cultural and Natural Heritage.

2.5 Project Financing

G1.12 FDN has co-administered SLNP together with CONAP since 1999. During this time CONAP has co-financed part of the activities that FDN has undertaken to protect Sierra del Lacandón, due to its status as a Protected Area.

As a complementary source for financing activities focusing on the management and protection of the Sierra del Lacandón, FDN seeks continuously additional financing from international development aid programs/initiatives that have finite time limits and consider specific goal achievements. This has been the way FDN has financed activities focusing on lowering environmental impacts from the socio-economic sectors present in the region.

The project activities to stop deforestation and degradation are designed to be financially self-sufficient in the long run. To date, the majority of the activities undertaken have been reliant on financing coming from development agencies and non-governmental organizations based on projects and within a limited time frame. Even with these sources of financing, the activities implemented were not sufficient to curb historically significant deforestation rates.

FDN has defined programs and strategies for the management of the SLNP in the past. However, many of the activities implemented for the achievement of the goals of each strategy were based on a financing source that is defined and finite in time and resources.

Fundación Defensores de la Naturaleza is a non-profit organization of Guatemala. It has no personal financial resources for the implementation of activities in the Sierra del Lacandón National Park. The protection of the national park land is partially funded by CONAP, which provides rangers, fuel, and food. The start of the REDD+ project, the development of documentation and some pilot activities have been funded by the European Union and the International Climate Initiative of the Ministry of Environment of Germany. Currently the park also receives funding from other projects funded by the European Union, USAID, the International Climate Initiative of the Ministry of Environment of Germany, and private sources. All project have a limited funding period, which ends in December 2015.

G4.3 A comprehensive online search was performed, and, as a result, there are no reports that demonstrate that the Project Participants (project proponent and project developers) are involved or complicit in any form of corruption.

2.6 Employment Opportunities and Worker Safety

G3.9 / G3.12 FDN has extensive experience in conservation and community development projects. Communication and capacity building activities have been undertaken in the communities since the beginning of the co-administration of the SLNP in 1999.

G3.9 / G3.10 Equal Employment Opportunity

The project rejects any kind of discrimination in employment opportunities that may arise during the lifetime of the project and promotes equality at work. All personnel contracts for the development of project activities are based on the experience and profile of the candidates applying to fill the position.

This project ensures that all individuals will be given an equal opportunity (based on Guatemala's laws²² ²³) to fill all employment positions (including management) if the job requirements are met. These benefits reach women and the most vulnerable and/or marginalized people in the community without any discrimination based on age, sex, marital status, ethnicity, social status or religious convictions, political ideas and/or sexual orientation. Documents explaining national rules on worker's rights and the obligations of both contracting parties will be made available in local languages when relevant.

During this monitoring period, Mr. Heriberto Lucero, Guatemalan farmer who lives in Santa Rita, was hired by FDN to conduct surveillance and monitoring patrols due to his skills and knowledge of the project zone. In addition, Manuel Icó, graduate of the agroforestry school, was hired by FDN and currently works as promoter of water projects in the communities of Poza Azul and Villa Hermosa. The project has generated work opportunities for local people. Another example is Irán Pop from San Juan Villa Nueva community, who works as a forest fire technician in SLNP (proof of contracts can be found in the Staff training folder).

Women have the same opportunities to participate in events, as evidenced in Figure 58, which demonstrates that Rebeca Escobar participated in the Conference of the Parties in Doha (Qatar) in 2012, the supreme decision-making body of the United Nations Framework Convention on Climate Change (UNFCCC). She is also in charge of assessing progress made in addressing climate change. In addition, Diana Cantoral, juridical procurator from Petén, was hired by FDN and participates as secretary of the Governance Committee in support of = conflict resolution (proof of contract in Staff training folder).

Risks and safety of workers

The project is developed within a National Park; an area with high susceptibility to be invaded due to the variety of natural resources. Therefore, there is a latent risk during patrols to meet people who carry out illegal activities. In monthly meetings, security issues in the park are discussed, in order to review and adjust the needs for the personnel or external support. However, interinstitutional presence in the park has increased the safety of people working in the project zone, reducing potential threats or conflicts.

²² Congreso de la República. 1993. Constitución Política de Guatemala. Available at: http://www.mintrabajo.gob.gt/images/organizacion/leyesconveniosyacuerdos/Leyes_Constitucionales/Constitucion_Politica_de_Guatemala.pdf

²³ PNUD Guatemala. 2010. Políticas públicas sobre mujeres y equidad de género en Guatemala 1989 – 2009. Available at: <http://desarrollohumano.org.gt/sites/default/files/PoliticasPublicasSobreMujeresyEquidadDeGenero.pdf>

For the activities in which people from the communities have an active role, FDN has always provided training and, when necessary, safety equipment. In tasks where worker's safety cannot be guaranteed (fire control, chainsaw utilization, etc.), FDN makes sure that the risks are minimized using best practices in occupational health and safety management, establishing and maintaining a preventative culture through active participation of workers in workshop to ensure a safe environment and healthy work. Permanent workers of different institutions have social insurance. Communities have constant training on actions that can reduce these risks.

FDN looks actively for improving the skills that can be undertaken “in house” and organizes training sessions for their employees (See Section 7). The participation of technical and non-technical staff in the development of this REDD+ project has been considered since the beginning and applied during the phase of design. OroVerde, South Pole Group and CONAP have had a participative role during the process of designing the REDD+ project. FDN ensures that the knowledge acquired by its technical team is shared and transmitted to other members of the team through periodical meetings and internal workshops.

Training provided for the project's employees and communities

On 30 April 2014, a workshop was held about “Presentation of the objectives and methodology of sampling for felines and large mammals” with the participation of FDN personnel, La Técnica Agropecuaria cooperativa, CONAP and Santa Rita – Defensores.



Figure 18 Workshop and field work.

Also, biologist Rebeca Escobar, who is in charge of QA/QC, participated in the XXXV International Course on Protected Areas, Biological Corridors and Ecosystem Services: Challenges and Tools for Adaptation and Mitigation to Climate Change. This course analyses the impacts of climate change on protected areas and how these can play a role in both adaptation and mitigation measures, while the lands continue to provide ecosystem services to local communities and society in general.

A general induction procedure for new personnel is followed for every person contracted by FDN (Refer to Staff training folder). For further information please refer to Section 7.1, as the training of project employees is an indicator for community monitoring, and Annex III, where a detailed list of training and events conducted by FDN during the monitoring period is reported.

2.7 Stakeholders

2.7.1 Customary and legal property rights

G5.1 / G5.5 The areas included in the project zone present diverse tenure status. The most representative are:

- Private owners organized in communities.
- Communities established on state-owned lands prior to the creation of the SLNP, with signed cooperation agreements.
- Communities established on state-owned lands prior to the creation of the SLNP but acknowledged by the Guatemalan Government.
- Illegal settlements irregularly established and unrecognized by the Guatemalan Government.
- Land owned by the NGO Fundación Defensores de la Naturaleza (FDN) and other private owners.
- State-owned land.

In total, there are 28 human settlements and 2 private conservation areas of FDN within or overlapping partially with the areas of the National Park. Communities have established Communal Councils of Development (Consejos Comunitarios de Desarrollo, COCODES). These are structures legally recognized by Article 4 of the Decreto 11/2002 of Guatemala and represent the lowest level of organization in the Systems of Councils for Development. They are formed by a Communal Assembly, integrated by all residents of a given community and the Coordination Organ, which is established according to the principles, values, normative and procedures of the community. The objectives of the COCODES are several, the most important being to promote, facilitate and support the organization and participation of the community in the processes of development that it may experience. It is relevant to mention that communities with historic land rights that do not have signed cooperation agreements and thus no legally recognized status within the SLNP, have COCODES. These councils have been the contact points between FDN and the communities in the process of design of this REDD+ project. They are in the moment in the process of negotiating the cooperation agreement that will legalize their permanence within the SLNP.

There are nine communities that were established within the protected area before the declaration of the National Park occurred. Today only three of them have clear and defined land use rights through signed cooperation agreements. This is the case in the Poza Azul, San Juan Villanueva and Villa Hermosa communities, which were established before the Law for Protected Areas²⁴ was launched and that signed a cooperation agreement²⁵ with CONAP in 1997. The compliance with these agreements is monitored

²⁴ Congreso de la República. 1989. Ley de Áreas Protegidas. Guatemala.

²⁵ The “agreements of intent” and the “relocation agreements” (previously called “Agreement of intentions”) are compromises acquired during January 1997 and October 1998 between CONAP and 19 communities that were settled in protected areas of Petén. Under this agreement the communities could stay in the area fulfilling certain conditions, like the delimitation of their respective boundaries, adoption of practices that contribute to stop the advances of the agricultural frontier and the degradation of natural resources in the area. In some of them was considered the future abandonment of the area and subsequent relocation.

today by FDN as one of the tasks assumed in the agreement with CONAP for the co-management of the SLNP. Some of the activities considered under the cooperation agreements focus on environmental education and processes for land use planning but their implementation relies exclusively on financing provided by development aid projects.

Guayacan, Nueva Jerusalén II, Manantialito, El Pital, Poza del Macho and Nuevo Paraíso 107 communities are also located within the SLNP and were as well established prior to the establishment of the protected area law. CONAP and FDN work currently on obtaining signed cooperation agreements for these communities to formalize their situation according to the legal jurisdiction that is applicable in the areas of the SLNP (See Table 7).

Strategy 1 of the project is focused on the signature of cooperation agreements between FDN/CONAP and the communities to formalize the permanence of communities within the SLNP; this is not yet finished. This project activity will seek the enforcement of the currently applicable Guatemalan Law on Protected Areas through securing land use rights for communities that have historic land rights within the park.

2.7.2 Stakeholder Process

G1.5 / G1.6 FDN has co-managed the SLNP since 1999. Through different lines of action such as Conservation and Sustainable Use of natural resources, Policies and Legislation, Sustainable development, Environmental Education, Data base researches and Institutional development; FDN has worked with the communities and implemented sustainable management projects for the SLNP.

In 2011, FDN and OroVerde Foundation initiated the Lacandón - Forests for Life Project with financial support from the European Union and the German Ministry of Environment through the International Climate Initiative. This project began to work with communities that had signed cooperation agreements with CONAP and communities with private property.

In the first stage, it was proposed to integrate all communities within the SLNP. However, in the SLNP there are several regimes of land tenure: state-owned land, cooperatives with private ownership, individual private property, and communities on state owned land with historic land rights and with or without signed cooperation agreements. Due to these different categories of land tenure within the SLNP, negotiation with all actors was difficult. Therefore, it was decided to initiate the first instance of the project with private landowners only: Técnica Agropecuaria, La Lucha, Unión Maya Itza (which are private ownerships) and the private properties of FDN.

Consultations and activities were carried out during the monitored period both for communities and other stakeholders. For a detailed information and register, please refer to Capacity building and governance in REDD in Section 7.1 and ANNEX III for the complete list of workshops developed.

Communities within SLNP

Table 7 Communities within SLNP.

No.	Communities	Relationship to the Park (SLNP)	Land Ownership	Socioeconomic Description
1.	San Juan Villanueva	Located in the Special Use Zone of SLNP; Intention Agreement since 1997	Intention agreement signed	Identify as Q'eqch'í ethnicity, with the majority originating in Baja and Alta Verapaz. This group signed a Cooperation Agreement with CONAP in 1997. The community produces its food through subsistence agriculture (corn, beans, squash, and chili). Squash and chili are produced in excess and support family incomes along with rearing of hens, pigs, turkey, and – less commonly – cows. Public infrastructure includes schools, shops that sell basic commodities, a typist academy, and Catholic and Evangelical churches. In terms of public health, not all families have toilets. Drinking water is sourced from a contaminated local stream. There is limited urban development. The community is connected to the village of Las Ruinas via a dirt road that connects to a paved road along the Naranjo Route. This community is in the phase of updating their agreement. Conflict in this community is related to purchase and sale of land. Those involved in this conflict include farmers and other people who do not know the terms of the Agreement.
2.	Poza Azul	Located in the Special Use Zone of SLNP; Intention Agreement since 1997	Intention agreement signed	Identify as Q'eqch'í ethnicity, with the majority originating in Baja and Alta Verapaz. This group signed a Cooperation Agreement with CONAP in 1997. The community produces its food through subsistence agriculture (corn, beans, squash, and chili). Squash and chili are produced in excess and support family incomes along with rearing of hens, pigs, turkey, and – less commonly – cows. Public infrastructure includes schools, shops that sell basic commodities, a typist academy, and Catholic and Evangelical churches. In terms of public health, not all families have toilets. Drinking water is sourced from a contaminated local sinkhole. There is limited urban development. The community is connected to the village of Las Ruinas via a dirt road that connects to a paved road along the Naranjo Route. Being a community with

No.	Communities	Relationship to the Park (SLNP)	Land Ownership	Socioeconomic Description
				difficult access, poverty is more evident in the community, it is difficult for commodities. This community is in the phase of updating their agreement. Conflict in this community is related to purchase and sale of land. Those involved in this conflict include farmers and other people who do not know the terms of the Agreement.
3.	Villa Hermosa	Located in the Special Use Zone of SLNP; Intention Agreement since 1997	Intention agreement signed	Majority Ladino population, originally from the interior of the country (southern and western coasts). This community signed a Cooperation Agreement with CONAP in 1997. The community produces its food through subsistence agriculture (corn, beans, squash, chili, sesame). Squash, chili, and sesame are produced in excess and support family incomes along with rearing of hens, pigs, turkey, and – more commonly – cows. Public infrastructure includes schools, shops that sell basic commodities, a typist academy, and Catholic and Evangelical churches. In terms of public health, not all families have toilets. Drinking water is sourced from a contaminated local stream and from some spring-fed ponds. There is limited urban development. The community is connected to the village of Las Ruinas via a dirt road that connects to a paved road along the Naranjo Route. This community is in the phase of updating their agreement. Conflict in this community is related to purchase and sale of land. Those involved in this conflict include farmers and other people who do not know the terms of the Agreement.
4.	Nueva Jerusalén II	Located in the Recovery Zone and the “Core Zone” of SLNP; community was present before the creation of the park was declared	Recognized; dialogue and negotiation process has been initiated to obtain permanent settlement rights in SLNP	Community is recognized as predating park creation. In the dialogue process for signing the Cooperation Agreement. There is not an adequate access route, and community infrastructure is minimal. Some shops and small pharmacies are present in the community. Food production relies on corn, beans, and less commonly, squash/pumpkin seeds. The main areas of conflict in this community are pressure for the purchase and sale of lands and leaders that hinder dialogue with CONAP.

No.	Communities	Relationship to the Park (SLNP)	Land Ownership	Socioeconomic Description
5.	Guayacán	Located in the Recuperation Zone and the "Core Zone" of SLNP; community was present before creation of the park	Recognized; dialogue and negotiation process has been initiated to obtain permanent settlement rights in SLNP	Community is recognized as predating park creation. In the dialogue process for signing the Cooperation Agreement. There is an unpaved access route, which is adequate in the summer. Community infrastructure includes Catholic and Evangelical churches, a school, access to piped water in their homes and a health clinic (Unidad Minima de Salud), as well as small shops. Food production relies on corn, beans, and less commonly, squash/pumpkin seeds, but some families have cows. The main areas of conflict in this community are pressure for the purchase and sale of lands and leaders that hinder dialogue with CONAP, in addition to the community's proposed expansion towards the Core Zone.
6.	El Pital	Located in the current Recuperation Zone, community was present before creation of the park	Advanced stages of the negotiation process to obtain permanent settlement rights in SLNP	Old settlement, currently undergoing negotiations to sign the Cooperation Agreement. Access to the community is inadequate. Infrastructure is minimal. limited only to a small school and an Evangelical church. Food production relies on corn, beans, and squash/pumpkin seeds, though some families have small herds of cattle. Water is scarce in the community, with few available sources (waterholes). It is common that women walk six (6) kilometers to the San Pedro River to wash clothing. Conflict in this area is related to the sale and purchase of land and dispute over the southern boundary with Guayacán, which has slowed the signing of an agreement.
7.	Manantialito	Agreement reached in 2015	Intention agreement signed	Community is recognized as predating park creation. The community signed a Cooperation Agreement in 2015. The access route to this settlement is inadequate (gaps). It is approximately eight (8) kilometers and connects to Pozo Azul. Community infrastructure includes Catholic and Evangelical churches, a school, small shops and a health clinic (Unidad Minima de Salud) where health workers arrive 2 times a month. Food production includes hens, turkeys, pigs, corn, beans, and occasionally squash/pumpkin seeds and sesame. Some families have cows. Water is scarce in this

No.	Communities	Relationship to the Park (SLNP)	Land Ownership	Socioeconomic Description
				community, derived primary from two drainages with levels that drop during summer. This is compounded by the fact that one of the springs is located on private land. The owner denies use of this water and has constructed spring-fed ponds that do not always have water. Conflict in this community is driven by the pressure caused by the sale and purchase of land by farmers.
8.	Las Victorias	Located in the Special Use Zone of SLNP, no intention agreement. Permanence was established previous to the creation of the park	Although the right to an intention agreement is recognized, the opportunity to advance negotiations has not been taken.	Settlement recognized as having existed prior to park creation. Unpaved access road that connects to the paved road leading to El Naranjo. Community infrastructure includes Catholic and Evangelical churches, a school, and some shops. Food is produced using hens, turkey, pigs, corn, and beans, and sometimes with squash/pumpkin seeds and sesame. Some families have cattle. The majority of families have access to water via spring-fed ponds. Conflict in this area relates to pressure from the purchase by and sale of land to farmers. The land in this community has been subject to a severe degree of deforestation.
9.	Unión Maya Itzá	Private property in the Special Use Zone	Individual plots, communally organized	Private cooperative, composed of families from various ethnic populations and have returned to this land in 1995. Access via unpaved road that connects to the Bethel route. Community infrastructure includes Catholic and Evangelical churches, a school, community store, and a public transportation line. Food production from hens, turkey, pigs, corn, and beans, and to a lesser degree squash/pumpkin seeds. The community sources water from the Yaxchilán stream. Conflict in this area is related to the internal purchase buy and sale of land to farmers that own large portions of the mountain with the intent of converting said lands to extensive pasture and monoculture, especially of African palm. One of the principal economic activities is the harvest of wood thru a management plan.
10.	El Retalteco	Private property in the Special Use Zone	Individual plots	Old arrangement of properties in which many families recently complete the legal procurement of their lands due to the creation

No.	Communities	Relationship to the Park (SLNP)	Land Ownership	Socioeconomic Description
				of laws concerning protected areas. This community consists of families from Retalhuleu and the oldest inhabitants are present due to Government policies in the early 70's of populating the border regions. Access via unpaved road that connects to the Bethel route. Community infrastructure includes Catholic and Evangelical churches, a school, and stores. Food production from hens, turkey, pigs, corn, and beans, and to a lesser degree squash/pumpkin seeds. Some of the oldest families in the cooperative have small and medium quantities of cattle. Conflict in this area is related to the purchase by and sale of land to farmers.
11.	La Lucha	Private property in the Special Use Zone	Individual plots, communally organized	Old, private cooperative, consisting of families from the southern and eastern coasts. Access via unpaved road that connects to the Bethel route. Community infrastructure includes Catholic and Evangelical churches, a school, and stores. Food production from hens, turkey, pigs, corn, and beans, and to a lesser degree squash/pumpkin seeds. Some of the families in the cooperative have small quantities of cattle. Production activities include management of forest products and other sustainable projects. Conflict arises from the sale of land to and purchase by farmers that desire extensive pasture. One of the principal economic activities is the harvest of wood and non-wood products thru a management plan.
12.	Técnica Agropecuaria	Private property in the Buffer Zone of the Maya Biosphere Reserve. Due to the importance of this group to the conservation of the park, it is included even though located outside of the park	Individual plots, communally organized	Old cooperative. Access via unpaved road that connects to the Bethel route. Commerce is tightly bound to Mexico via use of the Usumacinta Rivera. Community infrastructure includes Catholic and Evangelical churches, a school, stores, restaurants, hotels, and currency exchanges. Food production relies on hens, turkey, pigs, corn, and beans, and to a lesser degree squash/pumpkin seeds, sesame, and chili. Some of the families in the cooperative have small quantities of cattle. Conflict arises from the sale of land to and purchase by farmers that cut forest to create extensive pasture and plant African palm.

No.	Communities	Relationship to the Park (SLNP)	Land Ownership	Socioeconomic Description
13.	El Esfuerzo	Located in the Special Use Area in the southeast of SLNP. No agreement is in place	Dialogue is being initiated with the community	Old arrangement of properties, in which many families could not complete the legal procurement of their lands due to the creation of laws concerning protected areas. This community consists of families from Retalhuleu and the oldest inhabitants are present due to Méndez Montenegro Administration policies of populating the border regions. Access via unpaved road that connects to the Bethel route. Community infrastructure includes Catholic and Evangelical churches, a school, and stores. Food production from hens, turkey, pigs, corn, and beans, and to a lesser degree squash/pumpkin seeds and sesame. Some of the oldest families in the cooperative have small quantities of cattle. Conflict in this area is related to the purchase by and sale of land to farmers.
14.	Lagunitas, Nuevo Paraíso 107, Santa Amelia, Nuevo San José, Nuevo Edén, Las Flores, Las Ruinas, Nueva Canaan, Nueva Candelaria, El Esqueleto, Cruce Los Esclavos, La Llorona, Poza del Macho, Las Marías, and Tierra Linda Zapotal	All are communities that pre-date park creation. All are partially located within the Special Use Zone and subject to the signing of the Appropriateness of Use Agreement.	These communities participate in micro-region dialogs of the Naranjo Route (Defensores – CONAP – SLNP Advisory Committee and the Municipal Agrarian Office (OMA))	Old communities located at the legal limit of the park. The majority of families come from the south and east of the country. Access via a paved road that heads from the central area towards El Naranjo, border. In this area, community infrastructure is more extensive than in the communities within the park. This includes Catholic and Evangelical churches, stores, pharmacies, and other basic services of interest to the population. Food production is related to hens, turkey, pigs, corn, beans, and less commonly, squash/pumpkin seeds and sesame. The majority of these communities have access potable water from mechanical wells financed by the municipality. In this zone, cattle grazing has been extensively developed. Conflict in this area results from land pressure, including the sale of lands to farmers that graze cattle extensively. No cooperation agreements have been signed between these communities and CONAP.

Identification of Community Groups

The community groups were identified based on their level of organization and direct participation with the communities involved in the project.

Various institutions and NGOs have provided technical assistance since the 1990s to achieve the formalization of different groups. Hence, the community groups working for community development in the region identified are:

- Women's Committee for Ramon
- ACOFOP
- Pastoral Social of Petén
- Forest Monitoring Committee for Cooperatives
- Young Promoters of Sexual and Reproductive Health
- Community Tourism in La Técnica Agropecuaria Cooperative

Finally, stakeholder consultations were initiated in 2013 and have been ongoing during each phase of the project. For all activities, open and transparent communication and regular exchange between the communities within the SLNP and FDN are important aspects.

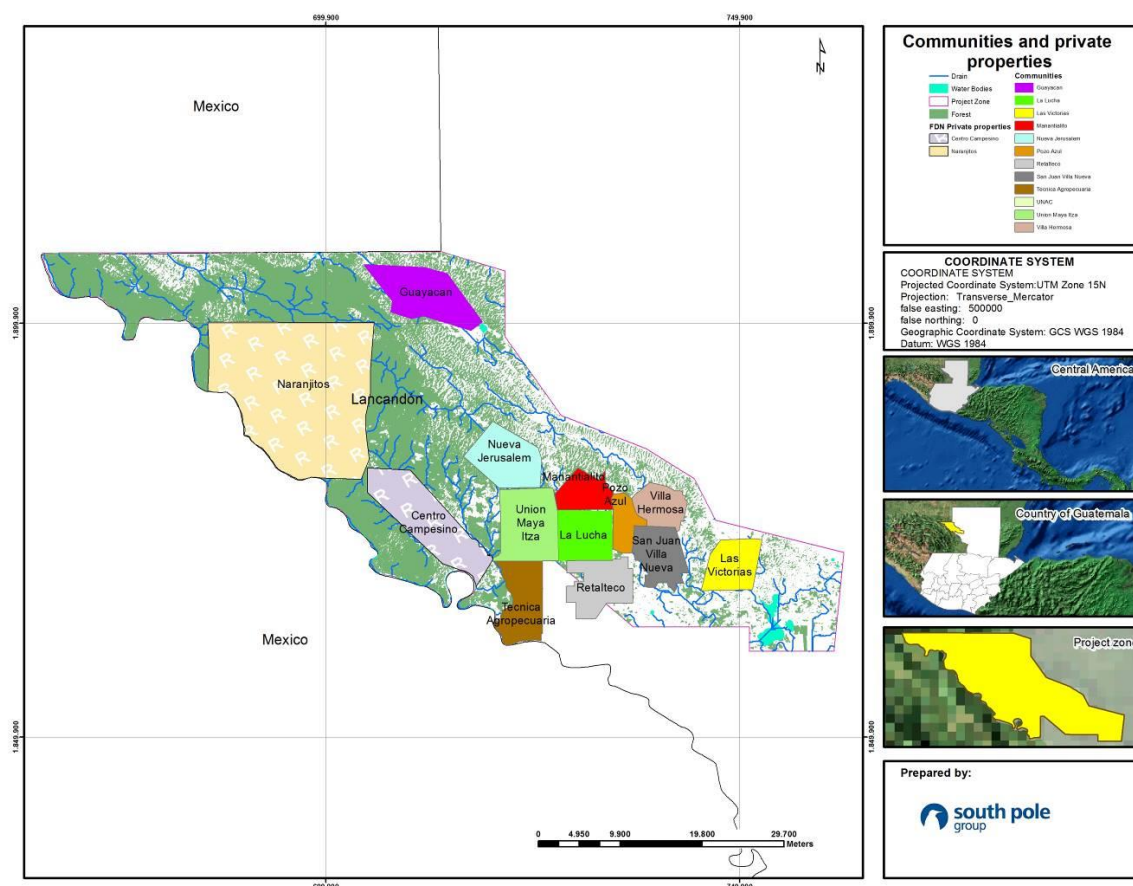


Figure 19 Communities and private properties location.

2.7.3 Stakeholder Engagement

G1.5 / G3.1 From the start of the project, communities and other stakeholders who would be potentially affected by the project activities have been involved in the project design through a well-constructed consultation process.

The process consisted in informing, training and achieving the Free, Prior and Informed Consent (FPIC) of the three communities participating in the REDD+ project with sufficient time and transparency, so that the community could determine, without any pressure or coercion, if they wished to participate or not.

G3.2 / G5.2 The workshops with cooperatives have run consistently since started in 2013 and exposed the groups to general concepts of climate change, CO₂, deforestation and REDD+. At these meetings, FDN explained the objectives, possible positive and negative impacts expected from the project, benefits, and implications that the project could have for their communities and quality of life. Printed media were also used to inform local people, providing an illustrated summary of the Project Design Document and a comic book on climate change that was translated into the Q'eqchi language. In addition, periodic newsletters were distributed to communities about the process of the project²⁶. For a complete Stakeholder engagement please refer to PDD Section 2.7.

G5.7 Community workshops were developed with the approval and advice of the following authorities working with the communities:

- CONAP (Consejo Nacional de Áreas Protegidas)²⁷ whose mission is to ensure the conservation and sustainable use of biological diversity and protected areas of Guatemala, as well as the natural goods and services they provide, by designing, coordinating and monitoring the implementation of policies, standards, incentives and strategies in collaboration with other actors.
- ACOFOP (Asociación de Comunidades Forestales de Petén)²⁸ whose main objective is to improve the quality of life of forest communities through community forest management, thereby promoting social, ecological, economic and political sustainability in the Multiple Use Zone of the Mayan Biosphere Reserve.
- Naturaleza para la Vida²⁹ whose mission is to provide local communities with the capacity to sustainably use natural and cultural resources to improve their living conditions.
- Religious organization Pastoral Social de la Tierra (from the municipalities of Santa Elena and La Libertad).

Other entities involved are INAB (Instituto Nacional de Bosques / National Institute of Forest), IDAEH (Instituto de Antropología e Historia / Institute of Anthropology and History), Guatemala Army, DIPRONA (División de Protección de la Naturaleza / Division of nature protection), and MARN (Ministerio de Ambiente y Recursos Naturales / Ministry of Environment and Natural Resources).

²⁶ Sierra del Lacandón Newsletter. Available at <http://www.bosques-lacandon.org/en/news/newsletter.html>

²⁷ Website: <http://www.conap.gob.gt/>

²⁸ Website: <http://www.acofop.org/>

²⁹ Website: <http://fnpv.org/>

G3.3 To inform communities about the validation and verification process, different communication methods are used. Communication is carried out principally through their representatives in the Governance Committee, who will transmit this information to their communities. Additionally, FDN supports the diffusion of information through press releases and visits to strategic communities. On January 24, 2016, an extraordinary meeting was held to report 1) the PDD Lacandón Forest for Life REDD + Project; 2) the progress of REDD+ Project; 3) the process and field visit for the validation and verification process. At the end of the meeting, an Act was signed where committee representatives confirmed to be aware of the progress of the project, the process of validation and verification and that the information is available online (Signed Act available to auditor).

Regarding to the access of the project documentation or communication plan, dissemination of information is done through the representative of the Governance Committee of each cooperative. They are the communication channel between communities and project proponents as established in the rules of procedure of the Governance Committee.

Consultation

G3.4 FDN has worked closely in the past with the COCODES of the project area and outside of the project area. Therefore, the identification of who could be potentially affected by a REDD+ project, i.e. REDD+ project stakeholders, is based on the observation and experience gathered during more than thirteen (13) years of management of the SLNP. The most relevant stakeholders identified in this process are the communities present in the area with land tenure and land use rights that are already regulated or are in the process of regulating.

G3.5 FDN informed the communities through their COCODES and provided prior to the meeting hard copies with key concepts of a REDD+ project and complementary information about the celebration of stakeholder consultations. Additionally, the COCODES provided to the community people information about the meeting. The attendance to the meetings reflected that the information was made available to everybody (attendance records available for auditor). When necessary, indigenous languages were used for transmitting the relevant concepts of the REDD+ project. The project activities to be implemented in the project scenario were selected during these consultations.

After having undertaken Stakeholder Consultations in each community, the documentation that this process generated was stored in physical and electronic format (as applicable). It can be made available for auditors upon request. During the stakeholder consultations, the inhabitants of the communities were encouraged to provide their feedback and opinions about the project, and questions and comments were recorded. The channels that could be used for these communications were diverse, ranging from direct communication with the technical personnel of FDN present in the area to e-mail to anonymous messages that could be left in the website of the CCBA during the public comment period and from which all communities were informed during the meetings.

Anti-Discrimination

G3.7 The primary project proponent has an excellent reputation (see Section 1.3) and is not involved in or complicit in any form of discrimination or sexual harassment with respect to the project.

The community involvement in the project has been inclusive, according to individual capabilities and independent of gender, cultural identity and religion. Recruiting personnel have as a principle employed qualified and reliable staff whose skills are in line with the requirements and objectives of the project, hired through a technical, transparent and non-discriminatory procedures based on merit and excellence.

A comprehensive online search was performed, and there are no reports that indicate that the Project Participants (project proponent and project developers) have been involved or complicit in any form of discrimination or sexual harassment with respect to the project.

Feedback and Grievance Redress Procedure

G3.8 The process for handling conflicts and grievances is in the process of being implemented by the Governance Committee. However, as they are in constant contact with the community and workers, field technicians are the first responders to requests from the community. Additionally, the representative of the Governance Committee of each cooperative serves as the communication channel between communities and project proponents, as established in the procedural guidelines of the Governance Committee.

For the specific monitoring period, the conflict resolution process was performed as follows:

- The FDN field technician maintains constant communication (at least once a month), with the community representative. During this meeting, the representative reports any news, complaints, questions, or suggestions for project development.
- The person who collects the information speaks with the REDD+ project coordinator, who is responsible for responding to comments. When additional assistance is needed, the consultant team is contacted.
- Finally, the FDN field technician provides the community representative with the responses to all questions, based on the information provided by the REDD+ project coordinator. The representative is also responsible for transmitting the information to the community on communal committees.

During the stakeholder consultation, all the question were about the project's progress, with the intention of verifying that the project will not stop. The duration of each cycle of questions and answers did not exceed one month. No other grievance occurred during the monitoring period.

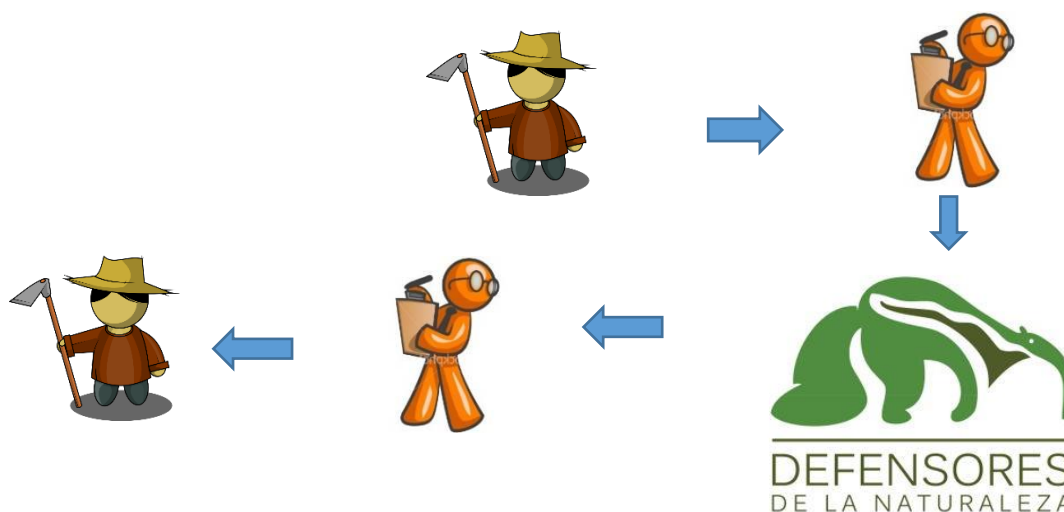


Figure 20 Communication diagram

Finally, the ultimate version of the Feedback and Grievance Redress Procedure is in the process of being developed and approved by the governance committee, which will have the final say on this document and will take into account the traditional methods used by Communities and Other Stakeholders.

3 LEGAL STATUS

3.1 Compliance with Laws, Statutes, Property Rights and Other Regulatory Frameworks

G5.6 Guatemala has initiated concrete actions to address the challenges of climate change. It has a National Change Climate Policy and one of the first laws on global climate change; this is the Climate Change Framework Law, whereby the National Council on Climate Change (Art. 8), integrates different sectors of the country including government, municipalities, mayors created and indigenous, private, peasant authorities, non-governmental organizations, indigenous groups, and universities^{30 31}.

- Protected Areas Law (Decree 4-89) and its reform in the Decree 19-89 and 110-96.
- Regulation of the Law on Protected Areas (Government Agreement 759-90).
- Biosphere Maya Reserve (Legislative Decree 5-90) and areas of Southern Petén (Decree 64-95) and Master Plans approved for each particular protected area.
- The Law of the Land Fund (Decree 24-9).

³⁰ Rivera, J. 2014. Ley marco para regular la reducción de la vulnerabilidad, la adaptación obligatoria ante los efectos del cambio climático y la mitigación de gases de efecto invernadero. Decreto 7 – 2013. Ministerio de Ambiente y Recursos Naturales. Available at:

http://www.unep.org/Transport/new/PCFV/pdf/Guatemala2014_2_JosLuisRivera.pdf

³¹ Congreso de la República de Guatemala. 2013. Decreto número 7 – 2013. Available at:

http://www.elaw.org/system/files/gt.ley_cambio.climatico.pdf

- Law of protection and improvement of the environment (Decree 68-89) and its reform in the Decree 1-93 and 90-2000.
- Regulation of Forestry Law (4.23.97 Resolution of Board of INAB).
- Law of the Ministry of Agriculture (Legislative Decree 102-70).
- Red List of Flora for Guatemala (Resolution No. ALC 028/2001 of CONAP).
- Trifinio Biosphere Reserve Act (Legislative Decree 939-87).
- Act declaring the Protected Area South of the Petén (Legislative Decree 64-95).
- Leasing State Reserve Areas (Government Agreement 199-93).
- Technical Cooperation Agreement between the Government of the Republic of Guatemala and the Government of the Republic of Finland on the management and sustainable use of natural coniferous forests of Guatemala (Decree 10-93).
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (1973). According to Resolution 22/90 amendments to Appendices I and II of the Convention (24/06/92) (Legislative Decree 63-79) are allowed.
- Convention on Wetlands of International Importance especially as Waterfowl Habitat (Legislative Decree 4-86).
- Convention for the Conservation of Biodiversity and Protection of Wilderness Areas in Central America (Legislative Decree 5-95).
- Law on the Use and Marketing of Gum Protection and the Chicozapote Tree (Legislative Decree 99-96).

All areas comply with the legislation previously described.

G3.11 Laws and regulations covering workers' rights

The Guatemalan Constitution³² and Labour Code³³ recognize the right to freely associate and bargain collectively. Articles 34 and 102 (q) of the Constitution expressly provide that workers may freely associate without discrimination or previous authorization from the government. The Labour Code further elaborates on these basic protections. Guatemala has signed 47 agreements³⁴ within the International Labour Organization³⁵.

The main social safeguards in Guatemalan legislation can be found in the Constitution of 1985, the Peace Accords of 1996, the Municipal Code of 2002, and the Cadastre Information Registration Law of 2005. The 1985 Constitution recognizes indigenous and collective rights (Art 67) and says that the State will develop legislation and mechanisms to protect these rights (Constitution Art. 68 and 70). This further legislation has never been passed. Two of the Peace Accords, the Agreement on Indigenous Peoples' Identity and Rights (Section F) and the Agreement on Socio-economic Aspects and the Agrarian Situation (Chapter 3, Section E), also refer to indigenous communities' rights to land.

At the international level, Guatemala has ratified ILO Convention 169 - The Indigenous and Tribal Peoples Convention, 1989, which is a legally binding international instrument open to ratification, deals specifically with the rights of indigenous and tribal peoples. Also, this is part of the United Nations Declaration on the Rights of Indigenous People, which constitutes the minimum standards for the survival, dignity and well-being of the indigenous peoples of the world.

This project ensures that all workers are treated according to the requirements of the applicable legislation. All personnel of the REDD+ project will have to agree and sign a contract in which his or her obligations and rights will comply with the applicable legislation and will be clearly exposed.

3.2 Evidence of Right of Use

Proof of title for the first instance

There are no ongoing or unresolved disputes or conflicts regarding land. Fundación Defensores de la Naturaleza owned Centro Campesino and Naranjitos. The three communities of La Lucha, La Técnica Agropecuaria and Unión Maya Itzá present legal land tenure. The proof of title documentation can be found in the Land tenure folder. The project proponents have the rights over the land and over the Certified Emissions Reductions to be generated by the project activities taking place in these areas.

G5.8 This project has established a Governance Committee, a legal entity in which participating communities and FDN have representatives (one regular and one substitute). The carbon credits will be awarded to this committee, where decisions on allocating revenues generated through the sale of credits will be taken by consensus. OroVerde participates as an observer and international assessor in an advisory capacity.

³² Guatemala Constitution. 1993. Available at:

http://www.mintrabajo.gob.gt/images/organizacion/leyesconveniosyacuerdos/Leyes_Constitucionales/Constitucion_Politica_de_Guatemala.pdf

³³ National laws on labour, social security and related human rights. Available at:

<http://www.ilo.org/dyn/natlex/docs/WEBTEXT/29402/73185/S95GTM01.htm>

³⁴ Available at:

http://www.minex.gob.gt/pBase.aspx?ID=/MAYT/MAYT_TRATADO_ACUERDO/MAYT_TRATADO_ACUERDO_VIGENTEWebReport.aspx

³⁵ Available at: <http://www.ilo.org>

3.3 Emissions Trading Programs and Other Binding Limits

G5.9 GHG emission removals generated by the project will not be used for compliance with an emissions trading program or to meet binding limits on GHG emissions. Given that Guatemala does not have any international agreement concerning emission caps under any compliance scheme, no double counting issues are applicable in this case.

3.4 Participation under Other GHG Programs

G5.9 Not applicable. The project has not sought or received any other GHG-related environmental credits.

3.5 Other Forms of Environmental Credit

G5.9. Carbon credits are currently the only environmental credit being generated from this project. No other environmental credits will be generated or sold.

3.6 Projects Rejected by Other GHG Programs

G5.9 Not applicable. The project has not been rejected by any other GHG program.

3.7 Respect for Rights and No Involuntary Relocation

G5.3 FDN has informed all communities living within the SLNP that this project's goal is reducing deforestation and complying with the requirements described by Guatemalan Law regarding the management procedures in protected areas. The process of distributing information to communities has been undertaken by the technicians of FDN, and it happened at the same time as the announcement of the stakeholder consultation meetings.

FDN together with CONAP has established guidelines for land use in these protected areas, which are reflected in cooperation agreements to be signed between CONAP and the communities that are currently settled without legal documentation but with historic land rights.

The cooperation agreements reflect legislation that is not currently being enforced. CONAP has already expressed willingness to maintain the settlements with historic land rights if they follow the guidelines considered by the applicable law.

Thus, if any community or settlement is evicted from the project area, it will be due to the application of the Guatemalan Law of protected areas, as has happened in the past, and not due to the implementation of the REDD+ project³⁶.

For the first instance of the project, the three cooperatives have land titles and the other lands are FDN properties. No involuntary relocation will occur.

³⁶ See newspaper publication <http://www.elperiodico.com.gt/es/pais/32539>

3.8 Illegal Activities and Project Benefits

G5.4 This project has been designed to a significant degree considering the illegal activities that currently occur within the borders of the SLNP. Project activities like the interinstitutional collaboration for patrolling the borders of the park, the normalization of land tenure, the maintenance of facilities that ease logistical implementation of control activities, the system for controlling materials coming out of the SLNP, the systems of quick alert in case of emergencies like fire, firefighting trainings, etc. are mostly focused on lowering the impacts of the illegal activities that currently occur and seeking the eradication of such practices from the area by creating an uncomfortable environment for the individuals that undertake such practices. None of the project benefits will be derived from illegal activities.

4 APPLICATION OF METHODOLOGY

4.1 Title and Reference of Methodology

- VCS Methodology for Avoided Unplanned Deforestation (VM0015 v1.1)
- Tool for the demonstration and assessment of additionality in VCS Agriculture, Forestry and Other Land Use (AFOLU) project activities
- VCS AFOLU Non-permanence Risk Tool: VCS Version 3.2
- Climate, Community & Biodiversity Standards (CCBS) 3rd edition

4.2 Deviations from the Monitoring Plan

No deviations from the monitoring plan apply.

4.3 Project Boundary

CL1.1 / CL2.1 The components that will be evaluated are:

- **Aboveground biomass: Tree.** Included. Principal carbon stock in forest ecosystems. Significant and binding.
- **Aboveground biomass: Non-Tree.** Included. This carbon stock is included in categories with final cover of perennial crops.
- **Below-ground.** Included. Optional according to the methodology. However, it assumes that carbon loss in this reservoir stock occurs as a linear decay function after deforestation.
- **Deadwood.** Excluded. Optional according to the methodology. Not significant.
- **Harvested Wood Products.** Excluded. Not significant.
- **Litter.** Excluded.
- **Soil Organic Carbon.** Excluded. Optional according to the methodology.

Table 8 Project boundaries.

Source		Gas	Included?	Justification/Explanation
Baseline	Aboveground biomass: Tree	CO ₂	Included	Mandatory. According to VM0015, carbon stock change in this pool is always significant and must be included.
		CH ₄	Excluded	Not applicable according to VM0015.
		N ₂ O	Excluded	Not applicable according to VM0015.
	Aboveground biomass: Non-Tree	CO ₂	Included	Optional. Non-tree biomass is incorporated only in final land cover classes where non-tree biomass is the dominant vegetation. Non-tree biomass estimates only apply to the post-deforestation class "ANG", whose emissions factor is based on an aggregated weighted calculation of various post-deforestation classes, of which non-tree biomass is a part (Refer to Step 6 of the VCS Technical Annex)
		CH ₄	Excluded	Not applicable according to VM0015.
		N ₂ O	Excluded	Not applicable according to VM0015.
	Below-ground	CO ₂	Included	Significant carbon pool. Optional and included due to below tree biomass is a significant component of emissions from deforestation.
		CH ₄	Excluded	Not applicable according to VM0015.
		N ₂ O	Excluded	Not applicable according to VM0015.
	Deadwood	CO ₂	Excluded	Insignificant carbon pool. Optional and excluded because a conservative approach is followed.
		CH ₄	Excluded	Not applicable according to VM0015.
		N ₂ O	Excluded	Not applicable according to VM0015.
	Harvested Wood Products	CO ₂	Excluded	Insignificant carbon pool in both planned and unplanned degradation. According the Significance Analysis, it is considered insignificant because it contributes to less than 1% of total emissions associated with project activities (Refer to Section 9.1 to VCS Technical Annex).
		CH ₄	Excluded	Not applicable according to VM0015.
		N ₂ O	Excluded	Not applicable according to VM0015.
	Litter	CO ₂	Excluded	Insignificant carbon pool. Optional and excluded because a conservative approach is followed.
		CH ₄	Excluded	Not applicable according to VM0015.
		N ₂ O	Excluded	Not applicable according to VM0015.

Source		Gas	Included?	Justification/Explanation
	Soil Organic Carbon	CO ₂	Excluded	Insignificant carbon pool. Optional and excluded because a conservative approach is followed. Since the project objective is forest conservation, it is expected that SOC will increase. Therefore, it can be conservatively excluded.
		CH ₄	Excluded	Not applicable according to VM0015.
		N ₂ O	Excluded	Not applicable according to VM0015.
Project	Aboveground biomass: Tree	CO ₂	Included	Mandatory. According to VM0015, carbon stock change in this pool is always significant and must be included.
		CH ₄	Excluded	Not applicable according to VM0015.
		N ₂ O	Excluded	Not applicable according to VM0015.
	Aboveground biomass: Non-Tree	CO ₂	Included	Optional. Not monitored in the project area. Accounted for only in the post-deforestation class accumulation factor.
		CH ₄	Excluded	Not applicable according to VM0015.
		N ₂ O	Excluded	Not applicable according to VM0015.
	Below-ground	CO ₂	Included	Significant carbon pool. Optional and included due to the fact that belowground tree biomass is a significant component of emissions from deforestation.
		CH ₄	Excluded	Not applicable according to VM0015.
		N ₂ O	Excluded	Not applicable according to VM0015.
	Deadwood	CO ₂	Excluded	Insignificant carbon pool. Optional and excluded because a conservative approach is followed.
		CH ₄	Excluded	Not applicable according to VM0015.
		N ₂ O	Excluded	Not applicable according to VM0015.
	Harvested Wood Products	CO ₂	Excluded	Insignificant carbon pool in both planned and unplanned degradation. According the Significance Analysis, it is considered insignificant because it contributes to less than 1% of total emissions associated with project activities (Refer to Section 9.1 to VCS Technical Annex).
		CH ₄	Excluded	Not applicable according to VM0015.
		N ₂ O	Excluded	Not applicable according to VM0015.
	Litter	CO ₂	Excluded	Insignificant carbon pool. Optional and excluded because a conservative approach is followed.

Source		Gas	Included?	Justification/Explanation
		CH ₄	Excluded	Not applicable according to VM0015.
		N ₂ O	Excluded	Not applicable according to VM0015.
	Soil Organic Carbon	CO ₂	Excluded	Insignificant carbon pool. Optional and excluded because a conservative approach is followed. In addition, conservatively excluded in the baseline and therefore not subject to monitoring.
		CH ₄	Excluded	Not applicable according to VM0015.
		N ₂ O	Excluded	Not applicable according to VM0015.

Lacandón – Forest for Life REDD+ Project is a grouped project in which the project proponent may add new project activity instances while continuing to meet the project requirements. The “Geographic grouped project area” for the project is also called the “Project Zone” (described in Section 1.2) and is the total area of the SLNP, where La Lucha cooperative is located, plus the areas of the cooperatives Unión Maya Itzá and La Técnica Agropecuaria, which are respectively located partially and totally outside the National Park area, as shown in Figure 21.

Since it is a grouped project, the initial project activity instances identified are Unión Maya Itzá, La Técnica Agropecuaria and La Lucha cooperatives, as well as the private properties of Fundación Defensores de la Naturaleza, and the Naranjitos and Centro Campesino areas. The physical locations where project activities take place are presented in Table 1 and Figure 22. The total area (forest and non-forest) for the first project instance is 53,884.22 ha, and the forest area is 45,288.81 ha.

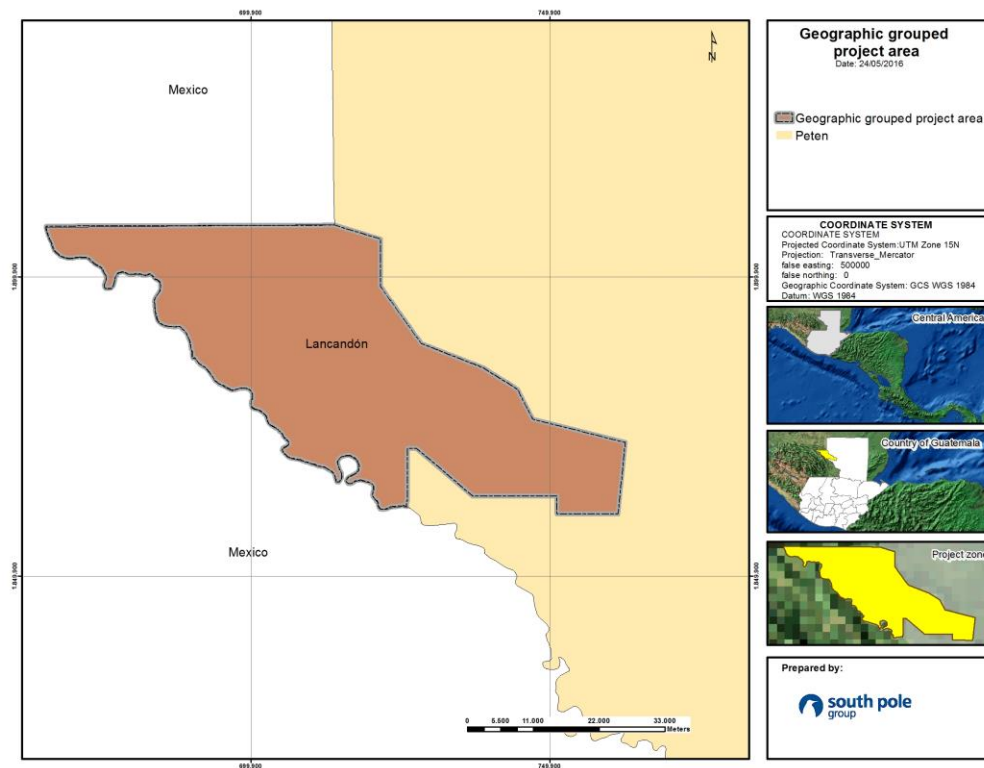


Figure 21 Geographic grouped project area.

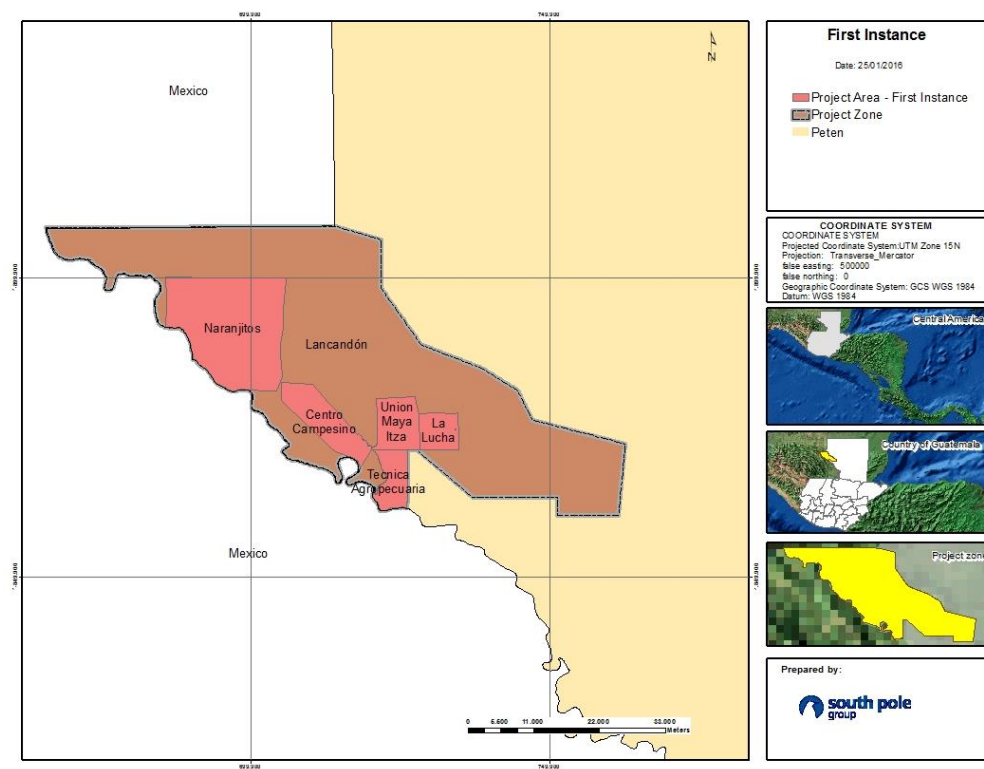


Figure 22 Project boundary – First Instance.

The geographic areas within which new project activity instances may be developed are shown in the Figure 23 and correspond to areas of Sierra de Lacandón National Park. New instances meeting the pre-established criteria in Section 4.4.1 may be added to the project subsequent to project validation and must be included in the monitoring report with the sufficient information (technical, financial, geographic and other relevant information) in compliance with the eligibility criteria. In addition, they must comply with VCS eligibility requirements.

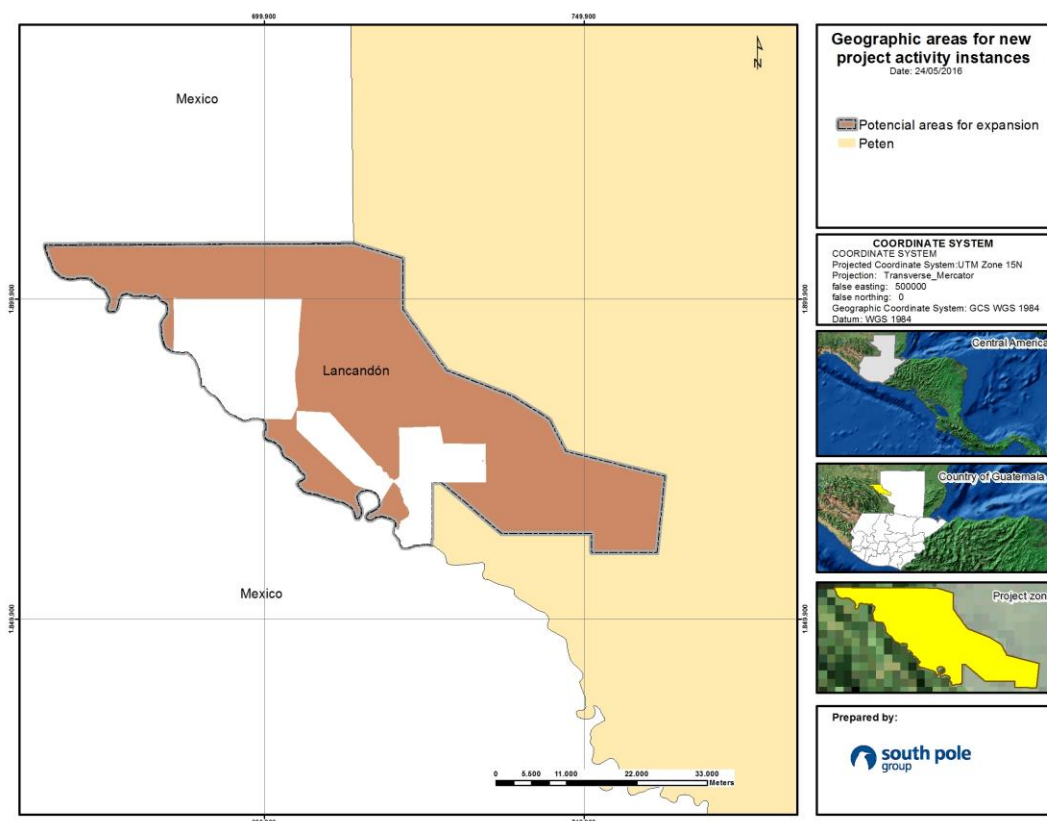


Figure 23 Geographic areas for new project activity instances.

4.3.1 Additional Information Relevant to the Project

G1.13 Project areas that may be included should be located within the Sierra del Lacandón National Park (Figure 21). All communities that meet the eligibility criteria specified below (G1.14) may be part of the project. New instances have not been yet included in the project to date.

G1.14 Eligibility Criteria

- Legal land tenure
Communities or cooperatives with property title or certifies of land use rights. For each new project instance, it will require that the community or the State present a certificate of land use and tenure issued by the corresponding authority.

- Cooperation agreement signed
The cooperation agreement is signed between CONAP, FDN, Municipality of Las Cruces or La Libertad (depend on the location of the community) and the community involved. The main objective is to cooperate between the parties to adapt the legal permanence of the community in areas of the park and to ensure the integrity of the protected area.
The community undertakes to respect existing laws, not introduce or establish species of animals and plants that are not compatible with the rules of management of the park and ensure sustainability of natural resources with accompanying FDN (Refer to Cooperation agreement folder for an example).
- Representative forest cover
GIS analysis will be performed to determine the potential forest areas to be deforested in the baseline case.
- Technical land eligibility criteria for forest carbon projects
Comply with the complete set of eligibility criteria and methodology tools described in Section 4.
- Adoption of project activities specified in the PDD
New instances should implement the project activities described in Section 2.2 in their areas.
- Free, prior and informed consent approved by the community
To include a new instance local consultations must be developed and eventually a document must be signed by the community, approving participation in the REDD+ project.
- Representative percentage of the families of the community in agreement with the project
The final document signed should have the approval of the families of the communities and no objection by those who do not want to be included.

It is expected that the expansion of the project will occur during the monitoring and verification of the previously validated instances. In addition, new instances should comply with VCS criteria:

- Meet the applicability conditions set out in the methodology and tools applied in this project. New instances must comply with 5 criteria (VM0015 methodology described in Section 4.2):
 - Unplanned deforestation (agriculture, grazing, fuel-wood, timber, charcoal) as long as fitting with most recent VCS AFOLU Guidelines
 - Can include one or more activities.
 - Can include multiple forest types, ages, successional state, agroforestry, natural, planted.
 - Must have forest classification minimum 10 years before start date.
 - Can include wetland forests unless they grow on peat (at least 65% organic matter, min. thickness 50 cm).
- Have the same baseline scenario as determined in the project description, which include agriculture and cattle pasture (PDD Section 4.6). Determination of baseline scenario is based upon the initial project activity instances.
- The same project activities as described in PDD Section 2.2 shall be implemented in new project instances.

- A Non-permanence risk buffer assessment shall be performed for each new instance.
- Demonstration of additionality are based upon the initial project activity instances. Face one of the same additionality barriers as the initial project instances (PDD Section 4.7). The common practice analysis is necessary to be done by the time of the validation of new instances, in order to demonstrate that the project activity still is not a common practice.
- Not be included in another GHG program.

Inclusion of New Project Activity Instances:

1. Occur within one of the designated geographic areas specified in the project description. For the project is the areas of SLNP as described in Section 4.4.
2. Comply with the complete set of eligibility criteria for the inclusion of new project activity instances.
3. Be included in the monitoring report with sufficient technical, financial, geographic and other relevant information to demonstrate compliance with the applicable set of eligibility criteria and enable sampling by the validation/verification body.
4. Be validated at the time of verification against the applicable set of eligibility criteria.
5. Have evidence of right of use, in respect of each project activity instance, held by the project proponent from the respective start date of each project activity instance.
6. Be eligible for crediting from the start date of the instance through to the end of the project crediting period.

New instances have not been yet included in the project.

G1.15 The scalability of the project is limited to the forest cover of the SLNP. Primary project proponent is responsible for performing management activities and ensuring the sustainability of forest conservation as well as the monitoring. In addition, the scalability could be limited by financial resources. The addition of new instances should have a financial plan and a schedule for activities to ensure the development of the project and achieve the climate, social and biodiversity benefits. It is expected that the following areas to be included are those corresponding to CONAP (areas of the State of Guatemala) since the REDD+ National Strategy has identified as a priority conservation area the SLNP, therefore, any cost will be assumed by the State³⁷³⁸³⁹.

Furthermore, in case new project activities are added, they should have the approval of all project proponents (note that the project committee is formed by a representative of each cooperative) and have the necessary financial resources to promote such activity at least for the initial phase. On the other hand, a pre-feasibility study should be conducted to identify that community and biodiversity benefits are not affected by the implementation of the new activity.

Risks associated with the non-continuation of benefits will be minimized by involving areas with communities committed to the project objectives and that meet the eligibility criteria.

³⁷ Banco Interamericano de Desarrollo. 2016. Available at <http://www.iadb.org/es/proyectos/project-information-page,1303.html?id=GU-T1194>

³⁸ Ministerio de Ambiente y Recursos Naturales. Available at http://www.marn.gob.gt/s/redd/paginas/Quines_coordinan

³⁹ Banco Interamericano de Desarrollo. 2014. Available at <https://forestcarbonpartnership.org/sites/fcp/files/2014/May/GU-T1194%20Estrategia%20Social%20y%20Ambiental.pdf>

4.4 Baseline Scenario

G2.1 The most likely land-use scenarios in absence of the project are agriculture and pasture cattle. Identified agents deforest due to reduced productive economic alternatives. In addition, one important agent besides farmers and ranchers is the invader, people from other places seeking lands and who illegally extract natural resources.

Sutter & Carr (2010) mention agricultural intensification represents a potential response to population density increases on a fixed quantity of farm land. These authors concluded changes in agricultural intensification in a context of rapidly expanding community and farm level population in an emerging agricultural frontier in SLNP. Agricultural frontiers are ideal for the adoption of livestock due large area of land and the little labor force required. The potential for an increase in deforestation rises with the introduction of cattle.

Previous investigations conclude that the likelihood of the deforestation rates are higher in the future. From these analysis it was concluded that the surrounding environment of these agents and drivers is very heterogeneous and present specific characteristics of the area:

- land tenure status,
- illicit markets,
- speculation with the land resources,
- incentives for agriculture, livestock and industrial uses of the land and
- the development of the population growth and the agricultural and livestock production associated

During the historic reference period, the deforestation was driven by speculation on lands and migration of small holders practicing subsistence agriculture and cattle ranching that facilitated directly or indirectly the entrance of persons/entities with higher economic power in the area. These economically more powerful actors invested in cattle ranching as activity for generating profit while increasing the value of the land. In many cases, big landowners bought or took through coercion land from smallholders and subsistence agriculture/cattle ranchers.

The region has experienced changes since the 1980s, and land has been distributed unequally. This has favored the development of medium/large scale cattle ranching over the production of “milpa” systems (maize), the latter of which is associated with lower deforestation rates. The land tenure regime has evolved, but speculations with the land and unregulated areas regarding land ownership have led to high deforestation rates.

The analysis also reveals that forest areas are practically “frontiers” that are exposed to pressures like subsistence agriculture, small, medium and large cattle ranchers, and the petrol industry. Usually these agents of deforestation do not have legal titles over the land they manage but regardless try to take advantage of them. Following this procedure, forest land is converted into permanent pastures through a process that starts with an occasional occupation of land.

All of these processes are likely to continue in the absence of project activities.

The processes described above would have impacts affecting both social and biodiversity aspects in the project area. On one hand the communities present in the project zone would have access to more land to develop subsistence agriculture, but factually they would act as mere initiators of a process that begins with deforestation and culminates with the deforested lands being owned by big landowners who transform the land into grasslands for cattle ranching or other extensive industrial activities such as palm

oil plantations. On the other hand, as a consequence of the reduction of forest cover, it is expected that several endangered species like the tapir (*Tapirus bairdii*) and other species with different status under IUCN like the jaguar (*Panthera onca*) that depend on habitat consisting of wide expansions of forest will disappear from the region due to habitat loss.

The variables that require primary care to control deforestation are the prevention of forest fires, institutional presence, migration and water bodies, due to weakness in these variables favors the increased accessibility to the project zone and the creation of new cultivation areas that will be converted to pastoral areas.

The factors most directly responsible for deforestation in the absence of the project are lack of sustainable livelihood and economic alternatives, lack of funding for infrastructure, health and education programs, and the unsustainable exploitation of natural resources to meet short-term economic and capital needs.

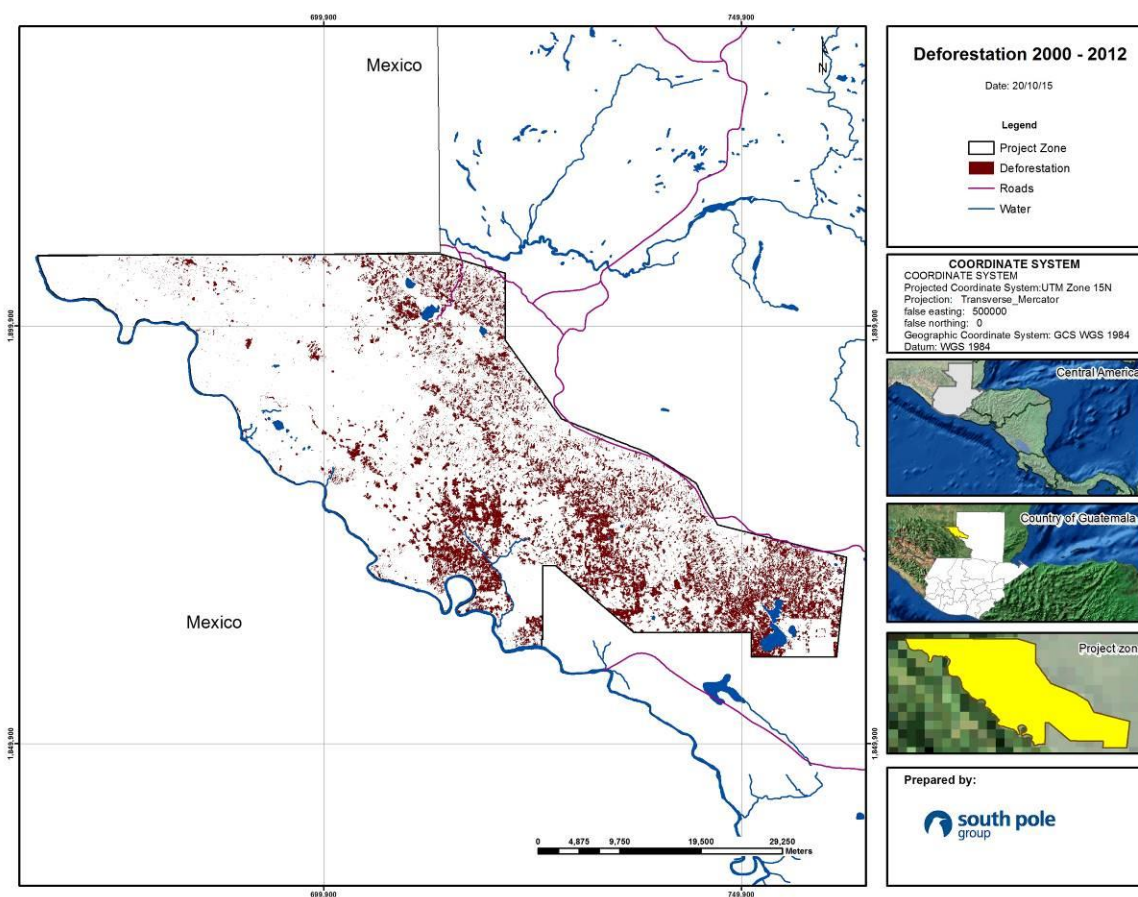


Figure 24 Deforestation of the project zone. Year 2000 – 2012.

4.5 Additionality

G2.2 The additionality section of this project has been developed following the guidance of the “VCS Tool VT0001 VCS AFOLU Additionality Tool V.3.0”.

Applicability conditions:

The AFOLU activities developed as project activities do not represent any violation of the applicable Laws of Guatemala.

Procedure

Step 1. Identification of alternative land use scenarios to the AFOLU project activity.

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

Three different real and credible scenarios were identified for the project area in absence of REDD+ activity:

Scenario 1: Continuation of the pre-project land use.

Poverty and deforestation may be positively associated. The lack of alternative work and land use activities creates a restriction that often forces workers to carry out low-income activities. Among these activities is the transformation of forest areas into agricultural lands, even when they are not suitable for this type of use.

Beyond the deforestation processes occurring currently within the project boundaries, the insufficient control and lack of governance and long term finance in the area may lead to higher deforestation rates in the future. In this scenario the deforestation rates would increase due to:

1. Human migration and the cultivation of basic grains through the process of slash and burn causing the conversion of forest into subsistence agricultural lands and grasslands for subsistence cattle ranching. Since 2003, these actions have converted 19,682 ha (10.62%) of forest cover to land for agricultural use.
2. Uncontrolled forest fires associated with slash and burn processes affect large areas of forests, which were not intended for agricultural activities. They also affect parts of the mountains (“serranías” in the local language) that are extremely fragile and after burned have very limited possibilities for short-term recovery.
3. Illegal selective logging for commercial timber production is present due to lack of enforcement of applicable laws and regulations, contributing to a continued impoverishment of the biomass stocks and leading to the generation of degraded and deforested lands.

Inside the project zone there are approved sustainably managed forest concessions, but their exploitation might occur illegally and expansion may occur within the borders of the project zone. The cooperation agreements between the government and the inhabitants might not be respected and generate uncertainty in the communities about the ownership and classification of the land, lack of control of the territory and higher rates of change of land use. Improved road access, and thus increased land rents, could encourage land consolidation, meaning cattle ranching on the one hand or more intensive

perennials for market on the other could become the main drivers of land cover change in the area. Or road access could accelerate colonization, expanding the “milpa” frontier further into the park.

Scenario 2: Project activity on the land within the project boundary performed without being registered as the VCS AFOLU project

This scenario considers the effective protection of the areas designed as “protected areas” and the associated biological corridors identified by the Government of Guatemala. These areas are officially managed by CONAP whereas in the case of SLNP the management is effectively undertaken by FDN, based on an agreement between both institutions. This scenario also considers the halt of the expansion processes of agriculture and cattle ranching areas and the forestry plantations to areas that are not considered in the management plans already approved by the relevant authorities. To the same extent, this scenario considers only those human settlements that already existed before the reserve was created and that remain according to the Decreto 5-90 Art.5-6, but also the enforcement of the law for protected areas (Decreto 4-89) in these communities.

This scenario would be only possible if CONAP and FDN had the capacity on their own and without any external support of executing control on the project area to avoid deforestation processes, the establishment of human settlements and its associated land use/land cover changes. Moreover, would occur if the Government of Guatemala would ensure and grant, without any external help, the enforcement of laws and politics currently available today. This would mean a clear and stable state of governability in the project area.

Nowadays the protection of forests in Guatemala does not consider the stand-alone capacity of the Government of Guatemala or its subsidiary bodies. Rather, the protection of forests and biodiversity is extremely reliant on development aid and conservation programs financed by external actors and often executed by national NGO in coordination with Guatemalan organizations. Thus, even if Scenario 2 is a feasible scenario, the time that it would take for achieving the protection of forests and biodiversity exclusively through funding and capacities stemming from Guatemalan institutions would jeopardize the conservation of forests that are nowadays experiencing relevant deforestation rates.

Scenario 3: Activities similar to the proposed project activity on at least part of the land within the project boundary of the proposed VCS AFOLU project

The project proposes the coordinated work between communities and FDN through strategies for reduce deforestation in the long term and integrating the institutional strengthening environmental governance and development work in the field with local populations. Similar activities could be found in the area, or at least part of the area, but under external cooperation programmes with limited time financing.

For example, establishing cooperation agreements and developing programs for the sustainable development of the region (outside of SLNP) were funded by Conservation International and the Wildlife Conservation Society within a program with limited time and financing horizon. Also, Rainforest Alliance has had a significant role on actions for preserving forest in the region too, but also included within a program of action with limited time and financing. Even when these activities help reducing the rates of deforestation, they do not tackle the governability and land tenure problems that need to be solved and for which the financial support of the carbon credits can be crucial.

On the other hand, the project proponents are communities represented through the Governance committee which allow the community empowerment and there is no history of this activity in the project zone.

Outcome of Sub-step 1a:

- Scenario 1: Continuation of the pre-project land use.
- Scenario 2: Project activity on the land within the project boundary performed without being registered as the VCS AFOLU project.
- Scenario 3: Activities similar to the proposed project activity on at least part of the land within the project boundary of the proposed VCS AFOLU project.

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

Scenario 2 and 3 are legal and enforced by mandatory applicable laws and regulations. Nevertheless even acting attending to the requirements of the Guatemalan Law, the deforestation rates occur.

Scenario 1: This scenario does not fulfil the requirements of the law for protected areas, since it is not allowed the change of land use or the development of unauthorized activities in a management plan. It is necessary for external agents with higher financial resources to support the local institutions that apply the legislation.

According to the used tool, any land use scenarios which are not in compliance with applicable mandatory laws and regulations must be removed from the land use scenarios identified in the sub-step 1a, unless it can be shown these land use scenarios result from systematic lack of enforcement of applicable laws and regulations.

In the case of Scenario 1, it is product of the failure to comply with applicable mandatory legislation. It is clear that the regulations for preventing the deforestation in Petén are not enforced as stated by the legislation. It was calculated that during the period 2000-2010 a deforestation rate of 1.8% occurred in areas that, according to the law, would have to be protected by the Government of Guatemala. This deforestation rate demonstrates that, even under the protection of the State of Guatemala deforestation occurs, demonstrating that the Law is not fully enforced. In a more relevant data, it was also demonstrated that from the 44 areas protected or awarded as concessions by the State of Guatemala in the entire reference region considered, 32 of them presented deforestation rates in different degrees while they should be protected (this is, deforestation rates should be zero). This implies that in 72% of these areas the control exerted by the state or its subsidiaries is not enough and suggest that more resources are needed. The areas in which no deforestation has been observed coincide with areas that present almost no accessibility to deforestation agents.

Outcome of Sub-step 1b:

- Scenario 1: Continuation of the pre-project land use.
- Scenario 2: Project activity on the land within the project boundary performed without being registered as the VCS AFOLU project.
- Scenario 3: Activities similar to the proposed project activity on at least part of the land within the project boundary of the proposed VCS AFOLU project.

Sub-step 1c. Selection of the baseline scenario

Barrier analysis is used to identify the most likely baseline scenario.

Step 2. Investment analysis

NA

Step 3. Barrier analysis***Sub-step 3a. Identify barriers that would prevent the implementation of the type of proposed project activity*****Investment barriers**

CONAP is the entity that manages the MBR, where SLNP is located. Its operational capacity is limited by a budget about \$ 1.78 million per year, which represents only 30% of optimal budget, as calculated by the regional office of CONAP, which would enable effective management of the MBR. Of this total, 70% is allocated to the MBR administration, 24% to the protection and restoration of the Laguna del Tigre National Park, and 6% to the promotion of the Patrimonial Fund for Yaxha-Nakum-Naranjo Park. More than 60% of the budget goes to personnel, so there are few funds for other ordinary expenses or investments on monitoring, research or restoration of biological resources. In addition, CONAP administers 32% of the national territory declared protected area, with an approximate budget allocation of 0.001% of the General Budget of the Nation.

Based on documented data, the budget for the protected area SLNP was almost US \$ 750,000 for 2003. Of this amount, US \$ 100,000 were for the archaeological site of Piedras Negras, about US \$ 19,000 to purchase equipment and approximately US \$ 83,000 to park protection (i.e., rangers salaries, patrols, training), food and fuel. The rest were funds to operations and payment of other staff. This budget is not sufficient to reduce deforestation rates.

Conservation initiatives depend, with few exceptions, of the external financing of projects, which cannot meet the costs of management functions such as monitoring, prevention and control of fires, and surveillance. This dependence on external sources is a disincentive for that the government assume its responsibility for funding management.

In addition, FDN has no own financial funds for the administration of SLNP, and depends on projects with limited funding and time. Without these external financing it would be difficult the administration of SLNP for FDN.

Institutional barriers

Guatemalan State characterizes by huge deficiencies in its institutional structure. Corruption in public administration is one of the features that has been present as a constant in the governments, in collusion with private actors, benefiting the private use of Public Management. The concern increases when corruption attack public finances, especially, the management and use of public resources, mainly from the taxes.

In the Guatemalan context, it is possible to identify six ways that lead to corruption: a) outdated legislation; b) weak institutions; c) deficient access to public information; d) low citizen participation; e) existence of conflict of interest; and f) impunity⁴⁰.

The Law of Protected Areas, through Article 57, provides the ability to CONAP to form associations and formal partnerships with civil society (NGOs, communities and other groups) to develop research, conservation and resource natural management in the MBR and the SLNP. Through these partnerships the concept of co-management of protected areas arises between CONAP and NGOs, by which the technical, financial and administrative responsibilities are shared. This is the case of the SLNP and forming co-administration between CONAP and FDN.

However, institutional presence is not enough to cover the entire park. The lack of State presence in remote areas of national territory means a lack of control under the natural resources, as well as deficient supervision of economic activities.

According to the “Manual for Forest Management in Protected Areas”⁴¹, the land use change for agricultural projects in plots with no more than five hectares continuous of forest cover is allowed. Nevertheless, the ability of forest recovery is very low (about 30%), and recovery of biodiversity is complex. In relation to the processes of forest management and reforestation of denude areas without forest cover, there are incentive forest programs, which are a reference to counter environmental degradation, this is evidence that more efforts in institutional and economic resources are needed and that the state should allocate to these programs⁴².

In addition, another factor is mistrust in the entities that manage protected areas, together with policy of evictions, States of Siege and lack of attention from the relevant public bodies to communities for years have also led to mistrust institutions trying to negotiate their stay in protected areas⁴³.

Technological barriers

This barrier is linked to Investment barrier, where protected areas present a lack of necessary and sufficient resources to acquire equipment and tools, which is reflected in monitoring and surveillance process.

Most projects are carried out with external financial. Monitoring deforestation is performed with remote sensing. However, additional investigation in the field is needed. This includes, for example, the determination of biomass or the detection of changes of land-use. While for large scale instance, deforestation can be quite easily detected with remote sensing, but degradation of forests can hardly be

⁴⁰ OXFAM, 2015. La Corrupción. Sus caminos, su impacto en la sociedad y una agenda para su eliminación. Guatemala. Available at:

https://www.oxfam.org/sites/www.oxfam.org/files/file_attachments/ints_la_corrupcion_sus_caminos_su_impacto_en_la_sociedad_y_una_agenda.pdf

⁴¹ Consejo Nacional de Areas Protegidas (CONAP). 2012. Manual para la Administración Forestal en Áreas Protegidas. Guatemala Government.

⁴² Secretaría de Planificación y Programación de la Presidencia (SEGEPLAN). 2013. Plan de Desarrollo Integral de Peten 2032. Gobierno de Guatemala. Available at: http://www.sgp.gob.gt/documentos/pdi_peten_2032_plan_vf.pdf

⁴³ Peace Brigades International. 2014. Petén: comunidades desplazadas en áreas protegidas. Available at: http://www.pbi-guatemala.org/fileadmin/user_files/projects/guatemala/files/english/140123_Peten_Comunidades_desplazadas_en_a_reas_protegidas.pdf

discovered with medium high resolution pictures. Unfortunately, the use of higher resolution data has also higher costs, and it is impossible to obtain for the project at the present.

Barrier related to local tradition

Despite the biological importance and its designation as a core conservation zone, the SLNP experiences some of the highest rates of population growth, land invasions, and agricultural expansion in Petén. The rural economy revolves around subsistence maize production. Most of the settlers arrived in the Park since 1988. Following decades of high internal displacement due to a protracted civil war, Q'eqchi' colonization of the park increased during the 1990s (Carr, 2004).

Over half of Petén's forests have been eliminated during the past forty years. Most of the forest elimination was caused by Ladino and Q'eqchi' small farmers, the two main groups inhabiting the Petén. Some research has suggested that the Q'eqchi' are more destructive of the forest environment than other ethnic groups farming in Petén. Q'eqchi' farmers have tended to settle remote regions and cleared forest at a rapid pace to open up land for maize agriculture.

Barriers due to social conditions and land-use practices

Until the 50s, Petén was a jungle territory, cover 90% by forest, with minimal presence of Maya Q'eqchi' population 'who had migrated from Alta Verapaz from the late 19th century. In 1959 was created the "Empresa de Fomento y Desarrollo de Petén - FYDEP" (Promotion Enterprise and Development of Petén), mandated to "colonize the department and generate agricultural development".

The overall average size of plots delivered by FYDEP was 91 ha per plot (or 2 "caballerizas"⁴⁴ in local language). Areas suitable for agriculture had smaller areas than those suitable for farming⁴⁵.

During this colonization, Arroyo Yaxchilan region was one of the regions recorded greater development, partly by presenting an increased agricultural productivity resulting from its fertile alluvial soils. The socio-economic development of the park has been strongly influenced by the construction of two roads: Bethel route along the southern boundary of the park, and Naranjo route border along the eastern boundary of the park.

Human migration and the cultivation of basic grains through the process of slash and burn the forest are the causes of greater impact on the natural landscape of the SLNP. Furthermore, when the capacity of the soil decreases, these areas are converted to pasture for cattle production.

Barriers relating to land tenure, ownership, inheritance, and property rights

There are different classification about land tenure and communities living in the SLNP:

- Communities already relocated outside the "Core Zone" or "Recovery Zone" of the SLNP.
- Communities which have signed Cooperation Agreements, enabling the permanence of communities in areas under certain conditions, as establish the delimitation of their respective boundaries and the adoption of practices that contribute to halt the advance of agricultural frontier and degradation natural resources of the area.

⁴⁴ 1 caballeriza equals 45 hectares

⁴⁵ Grünberg, Jorge *et al.* 2012. Tierra e Igualdad. Desafíos para la Administración de Tierras en Petén, Guatemala. Available at: https://nas.ucdavis.edu/sites/nas.ucdavis.edu/files/attachments/tierra_e_igualdad_final.pdf

- Communities in process to sign Cooperation Agreements.
- Communities with private properties.
- Communities with pending legal proceedings. This category includes those community groups that establish new settlements by force.

There are still communities that have not adapted its permanence within the park boundaries. In addition, SLNP presents constant risk of invasions. One strategy of the project seek enforcing the currently applicable Guatemalan Law on Protected Areas, through securing land use rights for communities that have historic land rights within the park.

Sub-step 3b. Show that the identified barriers would not prevent the implementation of at least one of the alternative land use scenarios.

The identified barriers would not prevent the continued use pre- project land use scenario. However, the scenario 2 and scenario 3 are prevented by institutional barriers (lack of control) and investment barriers (projects with limited time and budget execution) respectively. The baseline scenario selected is the Scenario 1: Continuation of the pre-project land use.

Step 4: Common practice analysis

CONAP and FDN have had the goal to reduce deforestation in MBR and SLNP. Previous projects with different institutions have promoted agroforestry as attractive alternatives for sustainable use of natural resources, training families in the areas of agroforestry and organic agriculture for their livelihood activities. There are some good examples of activities undertaken in the past and that have strong influence on the deforestation rates that the area experiences while, at the same time, handling both socio-economic and biodiversity aspects linked to the communities. However, all these experiences and lessons are pilot projects of great importance, as they serve as examples to develop this type of activity in the "Lacandón - Forests for life project". All programs developed where short-term (2-3 years) with limited financial support, involving farmers training and the installation of agroforestry systems, but do not take into account the monitoring process. Moreover, as pilot projects they do not involve all communities and / or private properties; in contrast to the present project.

In addition, the project will develop activities beyond those that had historically been developed in the project area by the FDN and/or CONAP or will give continuity to those activities that are currently financed by specific programs and that have a specific time horizon beyond which there is no financial resource available for. During the last years the world economic crisis has limited the access that the region of Petén has had to funding for developing activities focusing on reducing deforestation and ensuring the sustainable development of the region.

Furthermore, exists selective and illegal extraction of timber and non-timber natural resources (common practice). For timber species, the project proposes the sustainable forest management in communities within the protected area and for non-timber species, such as xate, it will incorporate market studies and potentially the establishment and improvement of local to international value chains.

As mentioned above, a common barrier is the specific time horizon and short life cycle for all initiatives existent where it is not possible to measure the real impact of the project on the quality of life of the population. This is exceeded by the long-term (30 years) of the REDD+ project.

Limiting access to forest land, discouraging the adoption of livestock, particularly in consonance with land titling programs, encouraging more diverse and intensive agricultural practices, and promoting rural development such as improved education, health care (including reproductive health), and alternative employment will be effective policies to reduce deforestation. The project costs will be generated by the additional investment on adjusting current uses and land use rights to applicable legislation, programs of forest protection and biodiversity, promotion of familiar systems for sustainable production, diversification and use of communal forestry resources, improved management of the SLNP, programmes of dialog with communities including capacitation and education and on programs of health in communities.

This additionality analysis reflects that the proposed VCS AFOLU project activity is not the baseline scenario and, hence, it is additional.

5 MONITORING DATA AND PARAMETERS

5.1 Description of the Monitoring Plan

CL4.1 The objective of climate monitoring is to obtain information to estimate the amount of avoided GHG emissions during the crediting period. For this purpose, FDN uses MIRA application and have the support of CONAP/CEMEC, which will produce land cover maps that help quantify the effectiveness of the project in terms of the amount of forest cover that remains intact and undisturbed as a result of anthropogenic influence.

The procedures for project monitoring and re-validation of the baseline have been designed according with the requirements of the VCS Methodology VM0015, and focus on

- Calculating carbon stock changes and GHG emissions for periodical verifications within the fixed baseline period; and
- Monitoring key baseline parameters for revisiting the baseline at the end of the fixed baseline period.

Calculating carbon stock changes and GHG emissions for periodical verifications within the fixed baseline period

Monitoring of carbon stocks changes and GHG emissions for periodic verification

1. Task 0: At first verification, confirmation of project area boundaries
2. Task 1: Monitoring of actual carbon stock changes and GHG emissions within the project area
3. Task 2: Monitoring of leakage
4. Task 3: Ex post calculation of net anthropogenic GHG emission reduction

1. Task 0: At first verification, confirmation of project area boundaries

There are not any issue regarding the land ownership for the areas of the first instances. All owners have legal rights and titles of their areas. The boundaries are clearly defined.

2. Task 1: Monitoring of actual carbon stock changes and GHG emissions within the project area

This task involves:

2.1. Monitoring of project implementation: – in which project activities implemented within the project area will be monitored in order to determine if they are consistent with the management plans of the project area and the PD. All maps and records (including pictures, testimonies, additional specific reports, etc.) generated during project implementation are stored by FDN and will be made available to auditing.

The project activities have been implemented. Please refer to Table 5.

2.2. Monitoring of land-use and land-cover change within the project area:

The project will collect data in form of satellite images and develop spatial classification that will offer information about the area of forestland converted to non-forest land and the area of forested land undergoing carbon stock decrease, per LULC change class.

The forest cover mapping is developed by CONAP/CEMEC as FDN has an agreement with them. The monitoring of planned and unplanned deforestation will be done using 30-meter or higher spatial resolution satellite images, depending on access to images and the advancement of technology.

The assessment of land-use and land-cover change was done using LANDSAT 8 images to generate the annual deforestation data. Deforestation estimates obtained from this analysis has been compared with the deforestation model established in the baseline scenario.

Table 9 Data used for historical LU/LC change analysis (Table 5 VM0015 v1.1).

Sensor	Resolution			Coverage (km2)	Acquisition date			Scene or point identifier		Sensor Type	Comment
	Spatial	Spectral	Spectral		DD	MM	YY	Path / Latitude	Row / Longitude		
Landsat 8	30x30	(1-7)	(15x15) 8	180	24	8	2014	21	48	http://glovis.usgs.gov/ImgViewer/showmetadata.cgi?scene_id=LC80210482014236LGN00	http://glovis.usgs.gov/ImgViewer/showmetadata.cgi?scene_id=LC80210482014236LGN00
Landsat 8	30x30	(1-7)	(15x15) 8	180	27	4	2014	20	48	http://glovis.usgs.gov/ImgViewer/showmetadata.cgi?scene_id=LC80200482014117LGN00	http://glovis.usgs.gov/ImgViewer/showmetadata.cgi?scene_id=LC80200482014117LGN00
Landsat 8	30x30	(1-7)	(15x15) 8	180	4	4	2014	19	48	http://glovis.usgs.gov/ImgViewer/showmetadata.cgi?scene_id=LC80190482014094LGN00	http://glovis.usgs.gov/ImgViewer/showmetadata.cgi?scene_id=LC80190482014094LGN00

2.3. Monitoring of carbon stocks and non-CO2 emissions from forest fires

In case uncontrolled forests fires or other catastrophic events occur within the project area, this project commits to estimate carbon stock losses as soon as possible. If planned and significant carbon stock decrease occurs in leakage management areas in the project scenario, CEMEC/CONAP is in charge of estimate the change in carbon stocks at least once after the planned event that caused the carbon stock decrease has happened.

In most cases, the ex ante estimated average carbon stocks per LU/LC class (or carbon stock change factors per LU/LC change category) will not change during a fixed baseline period and monitoring of carbon stocks will not be necessary.

However, monitoring of carbon stocks is mandatory in the following cases:

Within the project area:

- a) Areas subject to significant carbon stock decrease in the project scenario according to the ex ante assessment. These will be areas subject to controlled deforestation and planned harvest activities, such as logging, fuel wood collection and charcoal production. In these areas, carbon stock changes must be estimated at least once after each harvest event.

Within the project activities areas are planned logging representing a reduction in carbon stocks, whereby the monitoring will be:

- Through forest management plans of each community; as well as legal permits for removal. All forest harvest must have permission from the relevant authorities and lead a forest harvesting guide.
 - CONAP is in charge of the harvesting plans are complied with and verify forest harvesting. Annual Operating Plan are made and each cooperative has a regent which is responsible for all these activities.
 - Data will be stored in physical format (field) and then in digital formats.
- b) Areas subject to unplanned and significant carbon stock decrease, e.g. due to uncontrolled forest fires and other catastrophic events. In these areas, carbon stock losses will be estimated as soon as possible after the catastrophic event when significant. No such significant events were recorded in the monitoring period.

Within leakage management areas:

- a) Areas subject to planned and significant carbon stock decrease in the project scenario according to the ex ante assessment. In these areas, carbon stocks must be estimated at least once after the planned event that caused the carbon stock decrease.

The project does not consider a decrease in carbon stocks and increased emissions resulting from leakage prevention measures. All project proponents have legal land tenure so it is unlikely that a leak occurs.

Monitoring of carbon stocks is optional in the following cases:

Within the project area:

- a) Areas subject to carbon stock increase after planned harvest activities, such as logging, fuel wood collection and charcoal production. In these areas, the carbon stock increase occurring after the harvest event can be measured and accounted, when significant.

The project does not consider an increase in carbon stocks within the project area so this monitoring is not necessary.

- b) Areas recovering after disturbances, such as unplanned forest fires and other catastrophic events. In these areas, the carbon stock increase occurring after the catastrophic event can be measured and accounted, when significant.

The project does not consider the increase in carbon stocks that may occur after catastrophic events so it is not necessary this monitoring.

Within leakage management areas:

- a) Areas subject to carbon stock increase due to leakage prevention measures. In these areas, the carbon stock increase can be measured and accounted only up to the amount necessary to offset any carbon stock decrease caused by leakage prevention measures in other leakage management areas or in previous years.

The project does not consider an increase in carbon stocks within the leakage management areas so it is not necessary this monitoring.

Within the leakage belt:

- a) Areas undergoing significant changes in carbon stock may be measured at the end of each fixed baseline period in order to update carbon stock information for the subsequent period.

The project does not consider an increase in carbon stocks within the leakage belt so it is not necessary this monitoring.

2.4. Monitoring of impacts of natural disturbances and other catastrophic events

All decrease in carbon stocks due to natural disturbances or catastrophic events will be done through monitoring of forest cover by using satellite images; and the same method for monitoring forest cover in the project area will be use. Significant reduction in carbon stock will be reported in the verification process.

There are no catastrophic events for this monitoring period.

2.5. Total ex-post estimated actual net carbon stock changes and GHG emissions in the project area

All ex-post estimations in the project area will be summarized using Table 29 of the VCS methodology VM0015.

Data archiving

FDN will be responsible for the centralized documentation of all project planning and implementation. Quality Assurance and Quality control (QA/QC) procedures will be implemented to ensure that all materials generated through remote sensing and GIS exercises and biomass and leakage are measured and monitored precisely, credibly, verifiably, and transparently. FDN will coordinate QA/QC activities, and is responsible for documenting QA/QC procedures. For this purpose, FDN will designate a QA/QC coordinator; for the first verification, it is biologist Rebeca Escobar.

All documents related to the monitoring will be put together in hard/or digital files, and made available to the verification body at each verification event.

3. Task 2: Monitoring of leakage

3.1. Decrease in carbon stocks and increase in GHG emissions associated with leakage prevention activities

Leakage prevention measures in this project may include tree planting, agricultural intensification, fertilization and/or fodder production, a temporally significant reduction in carbon stocks and/or an increase in GHG emissions may occur compared to the baseline case. If this is the case, this project will account and monitor these sources of leakage emissions.

Monitoring of the forest-cover leakage belt is conducted through satellite images provided by CONAP/CEMEC.

3.2. Decrease in carbon stocks and increase in GHG emissions due to activity displacement leakage

- a. Monitoring of carbon stock changes - Deforestation above the baseline in the leakage belt area will be considered activity displacement leakage. Leakage will be calculated as the difference between the ex-ante and the ex-post assessment of the area of forestland converted to non-forest land in the leakage belt. Monitoring is undertaken following the same approach than in the monitoring of land-use and land-cover change within the project area.

Ex ante value: 7 579 ha

Ex post value: 3 953 ha

- b. Monitoring of increases in GHG emissions - emissions from forest fires were not included in the baseline, as they were considered not significant.

4. Task 3: Ex post net anthropogenic GHG emission reductions

Results for net anthropogenic GHG emissions are presented in Section 6.

Revisiting the baseline projections for future fixed baseline period

Baseline will be revisited every ten years. The first review is expected by 2022.

Update information on agents, drivers and underlying causes of deforestation – the personnel of FDN, in collaboration with other Guatemalan institutions, NGOs and Governmental Organizations will undertake ongoing surveillance and monitoring of deforestation threats, agents and drivers. All relevant information, data, reports, legal documents collected will be kept by FDN. Step 3 of the ex-ante methodology will be reassessed. As this project used a spatial model for locating the risk of future deforestation, new data on the spatial driver variables will be collected and new “Factor Maps” for the subsequent fixed baseline period will be generated. All information collected will be used at each revisiting of the baseline to conduct a complete analysis of agents, drivers, and causes of deforestation, in the same way it was completed for validation.

Adjustment of the land-use and land-cover change component of the baseline - If new VCS requirements on regional baselines are available, the project will use the most recent version. As this project foresees using a sub-national baseline and being included within a jurisdictional scenario at the time in which the baseline would have to be revisited, no further adjustments are needed in this case.

Adjustment of the carbon component of the baseline – If improved carbon stock data have become available over time, this project will use the most updated information.

CL4.2 All results will be publicly available on the internet and summaries are communicated to the Communities and Other Stakeholders through appropriate means. Additionally, all documents and information about the results of the monitoring and verification of this project will be published in the platforms of the VCS and CCB standards as usual.

FDN has extensive experience with dissemination of the project to communities. The most effective medium agreed with communities is the dissemination of periodic newsletter reporting the progress of the project in all its phases. The project considers the translation of important documents to Q'eqchi language. The monitoring plan and monitoring result will be disclosed through the governance committee and workshops with communities.

5.2 Data and Parameters available at Validation

CL4

Data Unit / Parameter:	i
Data unit:	Dimensionless
Description:	1, 2, 3 .. IRR A stratum within the reference region
Source of data:	Section 4.1 Annex VCS
Value applied:	Stratum 1 – Maya Biosphere Reserve (RBM) (with exclusions) Stratum 2 – Buffer Zone (ZA) Stratum 3 – Northern Lowlands
Purpose of the data:	Baseline emissions calculation. Annex VCS
Any comment:	To divide the RR into strata with specific characteristics

Data Unit / Parameter:	Thrp
Data unit:	yr
Description:	Duration of the historical reference period
Source of data:	Section 2 Annex VCS
Value applied:	10
Purpose of the data:	Baseline emissions calculation. Section 2 Annex VCS
Any comment:	Historical emissions and forest cover change

Data Unit / Parameter:	f(t)
Data unit:	Dimensionless
Description:	Time function equation, Approach b.
Source of data:	Mapa de Cambios 1986 – 2009 CEMEC
Value applied:	$[ABSLRR]_{(i,t)} = 1,225.37x - 2,447,617.33$
Purpose of the data:	Baseline emissions calculation. Annex VCS
Any comment:	Developing the project baseline

Data Unit / Parameter:	ABSLK
Data unit:	ha
Description:	Cumulative area of baseline deforestation within the leakage belt at year t

Source of data:	Calculated, see Annex VCS Section 1.1.3 and 4.1.2.2
Value applied:	Table 9c, 11c, 13c of VM0015.
Purpose of the data:	Leakage emissions calculation. Calculated according to requirements of VM0015 v1.1 by dividing ABSLRR (t) of stratum 1 of the RR by the leakage belt polygon.
Any comment:	Activity data for calculating GHG emissions in the baseline scenario

Data Unit / Parameter:	ABSLK_(fcl,t)
Data unit:	ha
Description:	Area of final (post-deforestation) forest class fcl deforested at time t within the leakage belt in the baseline case
Source of data:	Calculated, see Annex VCS section 4.1.2.2
Value applied:	Table 13c of VM0015.
Purpose of the data:	Leakage emissions calculation. Calculated according to requirements of VM0015 v1.1 by dividing ABSLRR (t) of stratum 1 of the RR by the leakage belt polygon.
Any comment:	Activity data for calculating GHG emissions in the baseline scenario

Data Unit / Parameter:	ABSLK_(i,t)
Data unit:	ha
Description:	Annual area of baseline deforestation in stratum (i) within the leakage belt at year t
Source of data:	Calculated, see Anexo VCS section 4.1.2.2
Value applied:	Table 9c, 11c, 13c of VM0015.
Purpose of the data:	Leakage emissions calculation. Calculated according to requirements of VM0015 v1.1 by applying the time function regression (with constraints) to stratum 1 of the RR and dividing it by the project area and leakage belt boundaries.
Any comment:	Activity data for calculating GHG emissions in the baseline scenario

Data Unit / Parameter:	ABSLK_(icl,t)
Data unit:	ha
Description:	Area of initial (post-deforestation) forest class fcl deforested at time t within the leakage belt in the baseline case
Source of data:	Calculated
Value applied:	Table 11c of VM0015
Purpose of the data:	Baseline emissions calculation. Calculated according to requirements of VM0015 v1.1 , 5.1 by applying land cover map to the result of Table 9c
Any comment:	Activity data for calculating GHG emissions in the baseline scenario

Data Unit / Parameter:	ABSLK_(t)
Data unit:	ha
Description:	Annual area of baseline deforestation within the leakage belt at year t
Source of data:	Calculated, see Annex VCS
Value applied:	Table 9c, 11c, 13c of VM0015.
Purpose of the data:	Leakage emissions calculation. Calculated according to requirements of VM0015 v1.1 , 4.1.2.2 by dividing ABSLRR (t)of stratum 1 of the RR by the leakage belt polygon.
Any comment:	Activity data for calculating GHG emissions in the baseline scenario

Data Unit / Parameter:	Annual area of baseline deforestation in stratum (i) within the RR at year t
Data unit:	ha
Description:	Cumulative area of baseline deforestation within the project area at year t
Source of data:	Calculated, see Annex VCS
Value applied:	Table 9b, Table 11b, Table 13b of VM0015
Purpose of the data:	Baseline emissions calculation. Calculated according to requirements of VM0015 v1.1 , 4.1.2.2 by dividing ABSLRR (t) of stratum 1 of the RR by the project area polygon.

Any comment:	Activity data for calculating GHG emissions in the baseline scenario
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Data Unit / Parameter:	ABSLPA_(i,t)
Data unit:	ha
Description:	Annual area of baseline deforestation within stratum (i) of the project area at year t
Source of data:	Calculated, see Annex VCS
Value applied:	Table 9b, 11b, 13b of VM0015
Purpose of the data:	Baseline emissions calculation. Calculated according to requirements of VM0015 v1.1 , 4.1.2.2 by dividing ABSLRR (t) of stratum 1 of the RR by the project area polygon.
Any comment:	Activity data for calculating GHG emissions in the baseline scenario

Data Unit / Parameter:	ABSLPA_(icl,t)
Data unit:	ha
Description:	Area of initial (pre-deforestation) forest class icl deforested at time t within the project area in the baseline
Source of data:	Calculated, see Annex VCS
Value applied:	Table 11b of VM0015
Purpose of the data:	Baseline emissions calculation. Calculated according to requirements of VM0015 v1.1 , 5.1 by applying land cover map to the result of Table 9b
Any comment:	Activity data for calculating GHG emissions in the baseline scenario

Data Unit / Parameter:	ABSLPA_(t)
Data unit:	ha
Description:	Annual area of baseline deforestation in the project area at year t
Source of data:	Calculated, see Annex VCS
Value applied:	Table 9b, 11b, 13b of VM0015
Purpose of the data:	Baseline emissions calculation. Calculated according to requirements of VM0015 v1.1 ,

	4.1.2.2 by dividing ABSLRR (t) of stratum 1 of the RR by the project area polygon.
Any comment:	Activity data for calculating GHG emissions in the baseline scenario

Data Unit / Parameter:	ABSLPAz_(t)
Data unit:	ha
Description:	Area of the zone z “deforested” at time t within the project area in the baseline case; ha
Source of data:	Calculated, see Annex VCS
Value applied:	Table 13b of VM0015
Purpose of the data:	Baseline emissions calculation. Methodology deviation applied. Equal to values of Table 11b.
Any comment:	Calculating net GHG emissions via post-deforestation C-stocks

Data Unit / Parameter:	ABSLRR
Data unit:	ha
Description:	Cumulative area of baseline deforestation in the reference region at year t
Source of data:	Calculated, see Annex VCS
Value applied:	Table 9a,11a VM0015
Purpose of the data:	Baseline emissions calculation. The reference area meets three of the four criteria in section 1.1.1 and then calculated according to 4.1.2.1 , option b with constraints applied.
Any comment:	Activity data for calculating GHG emissions in the baseline scenario

Data Unit / Parameter:	ABSLRR_(i,t)
Data unit:	ha
Description:	Annual area of baseline deforestation in stratum (i) within the RR at year t
Source of data:	Calculated, see Annex VCS
Value applied:	Table 9a,11a VM0015
Purpose of the data:	Baseline emissions calculation. The reference area meets three of the four criteria in section 1.1.1 and then calculated according to 4.1.2.1 ,

	option b with constraints applied.
Any comment:	Activity data for calculating GHG emissions in the baseline scenario

Data Unit / Parameter:	ABSLRR_(t)
Data unit:	ha
Description:	Annual area of baseline deforestation within the RR at year t
Source of data:	Calculated, see Annex VCS
Value applied:	Table 9a,11a VM0015
Purpose of the data:	Baseline emissions calculation. The reference area meets three of the four criteria in section 1.1.1 and then calculated according to 4.1.2.1 , option b with constraints applied.
Any comment:	Activity data for calculating GHG emissions in the baseline scenario

Data Unit / Parameter:	ARR_(i)
Data unit:	ha
Description:	Total forest area in stratum i within the reference region at the project start date
Source of data:	Calculated, see Annex VCS
Value applied:	Stratum 1: 1,248,936.12 Stratum 2: 110,828.16 Stratum 3: 531,726.48
Purpose of the data:	Baseline emissions calculation. Based on the results of satellite image processing as described in Annex section 4.1.1. and 2.4.3.
Any comment:	Benchmark forest cover used to assess emissions reductions.

Data Unit / Parameter:	Cab_(fcl)
Data unit:	t CO ₂ e ha ⁻¹
Description:	Average carbon stock per hectare in the above-ground biomass carbon pool of final post-deforestation class fcl
Source of data:	Calculated, see Annex VCS 6.1.1

Value applied:	Agropecuario-Non-Forest - Guamiles: 17.7 Palma Africana / humid: 123.3 Regeneración de bosque secundario: 11.3
Purpose of the data:	Baseline emissions calculation.
Any comment:	Calculate GHG emissions from deforestation

Data Unit / Parameter:	Cab_(cl)
Data unit:	t CO ₂ e ha-1
Description:	Average carbon stock per hectare in the above-ground biomass carbon pool of LU/LC class cl
Source of data:	Calculated, see Annex VCS 6.1.1
Value applied:	Forest class: BB-SH: 263.9 BMA-H: 343.8 BMA-SH: 314.7
Purpose of the data:	Baseline emissions calculation. Derived from various forest inventory data. See section 6.1.1.
Any comment:	Emissions factors for estimating GHG emissions from deforestation.

Data Unit / Parameter:	Cab_(fcl)
Data unit:	t CO ₂ e ha-1
Description:	Average carbon stock per hectare in the above-ground biomass carbon pool per zone z
Source of data:	Calculated, see Annex VCS 6.1.1
Value applied:	Zone 1 (BB-SH): 16.7 Zone 2 (BMA): 25.4
Purpose of the data:	Baseline emissions calculation. Derived from a combination of sources. See section 6.1.1
Any comment:	Growth factors in post-deforestation classes used for calculating net GHG emissions.

Data Unit / Parameter:	Cbb_(fcl)
Data unit:	t CO ₂ e ha-1
Description:	Average carbon stock per hectare in the below-ground biomass carbon pool per zone z
Source of data:	Calculated, see Annex VCS 6.1.1

Value applied:	Zone 1 (BB-SH): 26.8 Zone 2 (BMA): 22.6
Purpose of the data:	Baseline emissions calculation. Derived from a combination of sources. See section 6.1.1
Any comment:	Growth factors in post-deforestation classes used for calculating net GHG emissions.

Data Unit / Parameter:	Ctotz
Data unit:	t CO ₂ e ha ⁻¹
Description:	Average carbon stock of all accounted carbon pools per zone z
Source of data:	Table 17 VM0015
Value applied:	Zone 1 (BB-SH): 43.5 Zone 2 (BMA): 48.0
Purpose of the data:	Baseline emissions calculation. Calculated, see Anexo VCS Section 6.1.1
Any comment:	Estimate net GHG emissions

Data Unit / Parameter:	R _(j)
Data unit:	%
Description:	Root:shoot ratio
Source of data:	IPCC/Literature value
Value applied:	0.24
Purpose of the data:	Baseline emissions calculation. Default value of 0.24 from IPCC/Mokany 2006
Any comment:	Belowground biomass estimation

Data Unit / Parameter:	Cbb _(cl)
Data unit:	t CO ₂ e ha ⁻¹
Description:	Average carbon stock per hectare in the below-ground biomass carbon pool of LU/LC class cl
Source of data:	Calculated, see Annex VCS 6.1.1
Value applied:	Forest class: BB-SH: 63.3 BMA-H: 82.5 BMA-SH: 75.5
Purpose of the data:	Baseline emissions calculation. Default value of 0.24 from IPCC/Mokany 2006

Any comment:	Emissions factors for estimating GHG emissions from deforestation.
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Data Unit / Parameter:	CF _(j)
Data unit:	Dimensionless
Description:	Carbon fraction for tree tr, of species, group of species or forest type j
Source of data:	Arreaga 2002, IPCC GPG 2006 Chapter 6, Sec. 6.3.1.4
Value applied:	Forest classes: 0.5 Post-deforestation classes: 0.47
Purpose of the data:	Baseline emissions calculation. See section 6.1.1. of the Annex VCS Forest Classes: Arreaga 2002, local measurements Post-Deforestation classes: default values IPCC GPG 2006, Chapter 6, Sec. 6.3.1.4
Any comment:	Conversion from biomass to CO ₂ e

Data Unit / Parameter:	C _p
Data unit:	t CO ₂ e ha ⁻¹
Description:	Average carbon stock per hectare in the carbon pool p
Source of data:	Table 20.a
Value applied:	Table 20.a. VM0015
Purpose of the data:	Baseline emissions calculation. Requirements of VM0015 sec. 6.1.2.
Any comment:	n.a.

Data Unit / Parameter:	C _{tot} _(fcl, t)
Data unit:	t CO ₂ e ha ⁻¹
Description:	Average carbon stock of all accounted carbon pools in non-forest class fcl at time t;
Source of data:	n.a.
Value applied:	n.a.
Purpose of the data:	Baseline emissions calculation. Sec. 8.1.1 Anexo VCS. Leakage management activities do not decrease carbon stocks.
Any comment:	n.a.

Data Unit / Parameter:	Ctot_(icl)
Data unit:	t CO2e ha-1
Description:	Average carbon stock per hectare in all accounted carbon pools of LU/LC class cl
Source of data:	Calculated, see Annex VCS 6.1.1
Value applied:	Forest class: BB-SH: 325.9 BMA-H: 425.03 BMA-SH: 388.9
Purpose of the data:	Baseline emissions calculation. Derived from various forest inventory data. See section 6.1.1.
Any comment:	Emissions factors for estimating GHG emissions from deforestation.

Data Unit / Parameter:	Ctot_(icl, t)
Data unit:	t CO2e ha-1
Description:	Average carbon stock of all accounted carbon pools in forest class icl at time t
Source of data:	Calculated, see Annex VCS Section 9.1
Value applied:	Deemed de-minimus
Purpose of the data:	Baseline emissions calculation. Significance analysis. Table "Significancia" in "Tablas de VM0015 Lacandon_5areas"
Any comment:	n.a.

Data Unit / Parameter:	a1,a2
Data unit:	ha
Description:	Sample plot size
Source of data:	Various field plot types from: • Inventarios forestales de Concesiones en la RBM (IFCRBM)• Parcelas permanentes de monitoreo forestal (PPMF)• Inventarios de carbono de la UVG-CEA del área protegida Lachuá (ICUVG)• Inventario de carbono en el Parque Nacional Sierra del Lacandón (ICPNSL)
Value applied:	IFCRBM = >24.99 cm DAP 1ha (500mx20m), >9.99 cm DAP <25 cm DAP (0.2ha)

	PPMF = 0.25 ha (50mx50m) ICUVG = 0.1 ha (circular) ICPNSL = 0.1 ha (50mx20m)
Purpose of the data:	Baseline emissions calculation. Carrera, F. 1996; Castellanos, E. et al, 2010; Castellanos, E. et al, 2011; Márquez, J. 2013, Pinelo 2000, Pinelo 2004
Any comment:	Estimate of aboveground biomass

Data Unit / Parameter:	Cwp_(icl)
Data unit:	t CO ₂ -e ha ⁻¹
Description:	Average carbon stock per hectare in the harvested wood products carbon pool of initial forest class icl.
Source of data:	Historical harvest data 2000-2013 from CONAP.
Value applied:	1.3
Purpose of the data:	CONAP has historical harvest data for the MBR, and Bamaca's local harvesting efficiency study is one of the few that exist on the subject. Approximately 25% of a whole tree is converted into commercially viable wood. Guatecarbon project estimates that milled wood equates to harvested wood products (conservative), and that they are long-lived (no decay) because of the lack of data, which is also conservative.
Any comment:	To account for biomass losses due to harvest and to determine whether the harvested wood pool is significant. Finally, the significance analysis shows that the Hwp from legal and illegal harvests are insignificant and account for less than 1% of emissions.

Data Unit / Parameter:	ΔCabABSLKK
Data unit:	t CO ₂ -e
Description:	Cumulative baseline carbon stock changes for the above-ground biomass pool in the leakage belt
Source of data:	Table 21.c.1 of VM0015
Value applied:	See Table 21.c.1 of VM0015

Purpose of the data:	Baseline emissions calculation. GHG accounting in the leakage belt.
Any comment:	n.a.

Data Unit / Parameter:	$\Delta C_{bb}ABS LKK$
Data unit:	t CO ₂ -e
Description:	Cumulative baseline carbon stock changes for the below-ground biomass pool in the leakage belt
Source of data:	Table 21.c.1 of VM0015
Value applied:	See Table 21.c.1 of VM0015
Purpose of the data:	Baseline emissions calculation. GHG accounting in the leakage belt.
Any comment:	n.a.

Data Unit / Parameter:	$\Delta C_{ab}BS LPA$
Data unit:	t CO ₂ -e
Description:	Cumulative baseline carbon stock changes for the above-ground biomass pool in the project area
Source of data:	Table 21.b.1 of VM0015
Value applied:	See Table 21.b.1 of VM0015
Purpose of the data:	Baseline emissions calculation. GHG accounting in the project area.
Any comment:	n.a.

Data Unit / Parameter:	$\Delta C_{bb}BS LPA$
Data unit:	t CO ₂ -e
Description:	Cumulative baseline carbon stock changes for the below-ground biomass pool in the project area
Source of data:	Table 21.b.1 of VM0015
Value applied:	See Table 21.b.1 of VM0015
Purpose of the data:	Baseline emissions calculation. GHG accounting in the project area.
Any comment:	n.a.

Data Unit / Parameter:	Δ CADLK
Data unit:	t CO ₂ -e
Description:	Cumulative total decrease in carbon stocks due to displaced deforestation
Source of data:	Table 34, 35 of VM0015
Value applied:	See Table 34, 35 of VM0015
Purpose of the data:	Leakage emissions calculation. GHG accounting from displaced leakage
Any comment:	n.a.

Data Unit / Parameter:	Δ CBSLPA
Data unit:	t CO ₂ -e
Description:	Total baseline carbon stock changes in the project area
Source of data:	Table 36 of VM0015
Value applied:	See Table 36 of VM0015
Purpose of the data:	Baseline emissions calculation. GHG accounting in the project area
Any comment:	n.a.

Data Unit / Parameter:	Δ CPLdPA
Data unit:	t CO ₂ -e
Description:	Cumulative decrease in carbon stock due to planned logging activities at year t in the project area
Source of data:	Table 25b, 25d VM0015 Historical harvest data 2000-2013 from CONAP. See "Extracción_madera_Lacandon_I instancia.xlsx".
Value applied:	1.3 tCO ₂ e ha ⁻¹ yr ⁻¹ , but deemed de-minimis
Purpose of the data:	Baseline emissions calculation. To account for biomass losses due to harvest and to determine whether the harvested wood pool is significant.
Any comment:	The significance analysis shows that legal and illegal harvests are insignificant and account for less than 1% of emissions.

Data Unit / Parameter:	Δ CPSPA
Data unit:	t CO ₂ -e
Description:	Cumulative project carbon stock change within the project area at year t
Source of data:	Table 27, 36 VM0015
Value applied:	Table 27, 36 VM0015
Purpose of the data:	Baseline emissions calculation. Calculation of net GHG emissions reductions
Any comment:	n.a.

Data Unit / Parameter:	fj(DBH,H)_(ab)
Data unit:	kg arbol-1
Description:	Allometric equation linking biomass to a biometric variable (D).
Source of data:	Arreaga 2002
Value applied:	$\text{Log}_{10}(\text{Bt}) = -4.09992 + 2.57782 * \text{Log}_{10}(\text{DAP})$.
Purpose of the data:	Baseline emissions calculation. See Annex VCS section 6.1.1, N=139, R ² = .95
Any comment:	Estimate biomass to calculate GHG equivalents

Data Unit / Parameter:	Δ CUDdPA
Data unit:	t CO ₂ -e
Description:	Cumulative actual carbon stock change due to unavoided unplanned deforestation at year t in the project area
Source of data:	Table 27 VM0015. Section 7.1.2 Annex VCS
Value applied:	Effectiveness index: 45%
Purpose of the data:	Baseline emissions calculation. Measure of project effectiveness
Any comment:	n.a.

Data Unit / Parameter:	Δ REDD_(t)
Data unit:	t CO ₂ -e
Description:	Net anthropogenic greenhouse gas emission reduction attributable to the AUD project activity at year t
Source of data:	T36 VM0015

Value applied:	T36 VM0015
Purpose of the data:	Baseline emissions calculation. The cumulative result of applying the VM0015 methodology, see section 9.2 of Annex VCS
Any comment:	Final GHG calculations

Data Unit / Parameter:	DLF
Data unit:	%
Description:	Displacement leakage factor
Source of data:	%
Value applied:	5
Purpose of the data:	Leakage emissions calculation.Ex ante leakage
Any comment:	n.a

Data Unit / Parameter:	EI
Data unit:	%
Description:	Ex ante estimated Effectiveness Index
Source of data:	Estimate generated by the project
Value applied:	0.45
Purpose of the data:	Baseline emissions calculation. Estimate generated by the project
Any comment:	n.a.

Data Unit / Parameter:	ELK
Data unit:	t CO2-e
Description:	Cumulative sum of ex ante estimated leakage emissions at year t
Source of data:	Table 35,36 VM0015 Annex VCS
Value applied:	Table 35,36 VM0015 Annex VCS
Purpose of the data:	Leakage emissions calculation. The cumulative result of applying the VM0015 methodology, see section 8 of Annex VCS
Any comment:	n.a.

Data Unit / Parameter:	RF_(t)
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Data unit:	%
Description:	Risk factor used to calculate VCS buffer credits
Source of data:	VCS Non Permanence Risk analysis
Value applied:	10
Purpose of the data:	Baseline emissions calculation. See VCS Non-Permanence Risk Analysis
Any comment:	n.a.

Data Unit / Parameter:	VBC_(t)
Data unit:	t CO ₂ -e
Description:	Number of Buffer Credits deposited in the VCS Buffer at time t;
Source of data:	Table 36 VM0015
Value applied:	Table 36 VM0015
Purpose of the data:	Baseline emissions calculation. Calculated. Section 9.3
Any comment:	Buffer calculation

5.3 Data and Parameters Monitored

CL4.1

Data Unit / Parameter:	ABSLK
Data unit:	Hectares (ha)
Description:	Cumulative area of deforestation within the leakage belt at year t
Source of data:	Information about deforestation rates and forest cover change were provided by CONAP/CEMEC. The analysis was based on five zones where remote sensing data (Landsat 8) was available. Images acquired in 4/04/2012, 27/04/2012 and 24/08/2012.
Description of measurement methods and procedures to be applied:	The monitoring of the forest coverage in the leakage belt was conducted through satellite image analysis and Geographic Information System. Spatial resolution images are 30 m, allowing to work with better resolution and accuracy in the analysis of deforestation.
Frequency of monitoring/recording:	At each verification period

Value monitored:	Table 9c, 11c, 13c of VM0015
Monitoring equipment:	Geographic Information System (ArcGIS 10.3)
QA/QC procedures to be applied:	Quality control/quality assurance (QA/QC) procedures will be performed by CEMEC/CONAP according to the guidelines in Annex PD VCS GuateCarbon. The assessment of the monitoring period used remote sensing images of Landsat 8 with significant cloud coverage in the Northeast of the MBR. In the West zone, it was necessary use a rainy season image. For the SLNP were used images from 24/08/2014 and 27/04/2014.
Calculation method:	Activity data for calculating GHG emissions. Calculated according to requirements of VM0015 v1.1.
Any comment:	See document: CEMEC_informe cobertura_2014

Data Unit / Parameter:	ABSLK_(i,t)
Data unit:	ha
Description:	Annual area of deforestation in stratum (i) within the leakage belt at year t
Source of data:	Satellite images
Description of measurement methods and procedures to be applied:	Satellite image analysis and Geographic Information System.
Frequency of monitoring/recording:	At each verification period
Value applied:	Table 9c, 11c, 13c of VM0015.
Monitoring equipment:	GIS software
QA/QC procedures to be applied:	Please refer to Monitoring Plan
Calculation method:	Activity data for calculating GHG emissions. Calculated according to requirements of VM0015 v1.1.
Any comment:	n.a.

Data Unit / Parameter:	ABSLK_(t)
Data unit:	ha
Description:	Annual area of deforestation within the leakage belt at year t
Source of data:	Satellite images
Description of measurement methods and procedures to be applied:	Satellite image analysis and Geographic Information System.

Frequency of monitoring/recording:	At each verification period
Value applied:	Table 9c, 11c, 13c of VM0015.
Monitoring equipment:	GIS software
QA/QC procedures to be applied:	Please refer to Monitoring Plan
Calculation method:	Activity data for calculating GHG emissions. Calculated according to requirements of VM0015 v1.1.
Any comment:	n.a.

Data Unit / Parameter:	ABSLPA
Data unit:	ha
Description:	Cumulative area of deforestation within the project area at year t
Source of data:	Satellite images
Description of measurement methods and procedures to be applied:	Satellite image analysis and Geographic Information System.
Frequency of monitoring/recording:	At each verification period
Value applied:	Table 9b, 11b, 13b of VM0015
Monitoring equipment:	GIS software
QA/QC procedures to be applied:	Please refer to Monitoring Plan
Calculation method:	Activity data for calculating GHG emissions. Calculated according to requirements of VM0015 v1.1.
Any comment:	n.a.

Data Unit / Parameter:	ABSLPA_(i,t)
Data unit:	ha
Description:	Annual area of deforestation within stratum (i) of the project area at year t
Source of data:	Satellite images
Description of measurement methods and procedures to be applied:	Satellite image analysis and Geographic Information System.
Frequency of monitoring/recording:	At each verification period
Value applied:	Table 11b of VM0015
Monitoring equipment:	GIS software
QA/QC procedures to be applied:	Please refer to Monitoring Plan
Calculation method:	Activity data for calculating GHG emissions.

	Calculated according to requirements of VM0015 v1.1.
Any comment:	n.a.

Data Unit / Parameter:	ABSLPA_(t)
Data unit:	ha
Description:	Annual area of deforestation in the project area at year t
Source of data:	Satellite images
Description of measurement methods and procedures to be applied:	Satellite image analysis and Geographic Information System.
Frequency of monitoring/recording:	At each verification period
Value applied:	Table 9b, 11b, 13b of VM0015
Monitoring equipment:	GIS software
QA/QC procedures to be applied:	Please refer to Monitoring Plan
Calculation method:	Activity data for calculating GHG emissions. Calculated according to requirements of VM0015 v1.1.
Any comment:	n.a.

Data Unit / Parameter:	AUFPA_(icl,t)
Data unit:	ha
Description:	Areas affected by forest fires in class icl in which carbon stock decrease occurs at year t
Source of data:	Fire monitoring reports from CEMEC
Description of measurement methods and procedures to be applied:	Satellite image analysis
Frequency of monitoring/recording:	At each verification period
Value applied:	2012: 127.32 ha 2013: 454.9 ha 2014: 14 ha
Monitoring equipment:	GIS software
QA/QC procedures to be applied:	Please refer to Monitoring Plan
Calculation method:	Fire monitoring reports from CEMEC
Any comment:	No large fires or events were detected in the project area

Data Unit / Parameter:	ΔCFCdPA
Data unit:	t CO ₂ -e
Description:	Cumulative decrease in carbon stock due to forest fires and catastrophic events in the project area
Source of data:	Fire monitoring reports from CEMEC
Description of measurement methods and procedures to be applied:	Satellite image analysis
Frequency of monitoring/recording:	At each verification period
Value applied:	n.a.
Monitoring equipment:	GIS software
QA/QC procedures to be applied:	Please refer to Monitoring Plan
Calculation method:	n.a
Any comment:	No large fires or events were detected in the project area

Data Unit / Parameter:	$\Delta\text{CFCdPA}_{(t)}$
Data unit:	t CO ₂ -e
Description:	Total decrease in carbon stock due to forest fires and catastrophic events at year t in the project area
Source of data:	Fire monitoring reports from CEMEC
Description of measurement methods and procedures to be applied:	Satellite image analysis
Frequency of monitoring/recording:	At each verification period
Value applied:	n.a.
Monitoring equipment:	GIS software
QA/QC procedures to be applied:	Please refer to Monitoring Plan
Calculation method:	n.a
Any comment:	No large fires or events were detected in the project area

Data Unit / Parameter:	ΔCPSPA
Data unit:	t CO ₂ -e
Description:	Cumulative project carbon stock change within the project area at year t
Source of data:	Satellite images

Description of measurement methods and procedures to be applied:	Methodology VM0015 v1.1.
Frequency of monitoring/recording:	At each verification period
Value applied:	Table 36.
Monitoring equipment:	n.a.
QA/QC procedures to be applied:	Please refer to Monitoring Plan
Calculation method:	Activity data for calculating GHG emissions reductions according to methodology VM0015 v1.1.
Any comment:	n.a.

Data Unit / Parameter:	$\Delta\text{CPSPA}_t(t)$
Data unit:	t CO ₂ -e
Description:	Annual project carbon stock change within the project area at year t
Source of data:	Satellite images
Description of measurement methods and procedures to be applied:	Methodology VM0015 v1.1.
Frequency of monitoring/recording:	At each verification period
Value applied:	Table 36.
Monitoring equipment:	n.a.
QA/QC procedures to be applied:	Please refer to Monitoring Plan
Calculation method:	Activity data for calculating GHG emissions reductions according to methodology VM0015 v1.1.
Any comment:	n.a.

Data Unit / Parameter:	ΔCUCdPA
Data unit:	t CO ₂ -e
Description:	Cumulative decrease in carbon stock due to catastrophic events at year t in the project area
Source of data:	n.a.
Description of measurement methods and procedures to be applied:	n.a.
Frequency of monitoring/recording:	At each verification period
Value applied:	n.a.
Monitoring equipment:	n.a.
QA/QC procedures to be applied:	Please refer to Monitoring Plan

Calculation method:	Activity data for calculating GHG emissions reductions.
Any comment:	No significant events were detected in the project area

Data Unit / Parameter:	ΔCUCdPA_t
Data unit:	t CO ₂ -e
Description:	Total decrease in carbon stock due to catastrophic events at year t in the project area
Source of data:	n.a.
Description of measurement methods and procedures to be applied:	n.a.
Frequency of monitoring/recording:	At each verification period
Value applied:	n.a.
Monitoring equipment:	n.a.
QA/QC procedures to be applied:	Please refer to Monitoring Plan
Calculation method:	Activity data for calculating GHG emissions reductions.
No significant	No significant events were detected in the project area

Data Unit / Parameter:	ΔCUCiPA
Data unit:	t CO ₂ -e
Description:	Cumulative increase in carbon stock in areas affected by catastrophic events (after such events) at year t in the project area
Source of data:	n.a.
Description of measurement methods and procedures to be applied:	n.a.
Frequency of monitoring/recording:	At each verification period
Value applied:	n.a.
Monitoring equipment:	n.a.
QA/QC procedures to be applied:	Please refer to Monitoring Plan
Calculation method:	Measure carbon stock increases from natural disturbance/catastrophic events
Any comment:	No significant events were detected in the project area

Data Unit / Parameter:	$\Delta\text{CUCiPA}_{(t)}$
Data unit:	t CO ₂ -e
Description:	Total increase in carbon stock in areas affected by catastrophic events (after such events) at year t in the project area
Source of data:	n.a.
Description of measurement methods and procedures to be applied:	n.a.
Frequency of monitoring/recording:	At each verification period
Value applied:	n.a.
Monitoring equipment:	n.a.
QA/QC procedures to be applied:	Please refer to Monitoring Plan
Calculation method:	Measure carbon stock increases from natural disturbance/catastrophic events
Any comment:	No significant events were detected in the project area

Data Unit / Parameter:	ΔCUFdPA
Data unit:	t CO ₂ -e
Description:	Cumulative total decrease in carbon stock due to unplanned (and planned – where applicable) forest fires in the project area
Source of data:	Fire monitoring reports from CEMEC
Description of measurement methods and procedures to be applied:	Satellite image analysis
Frequency of monitoring/recording:	At each verification period
Value applied:	n.a.
Monitoring equipment:	n.a.
QA/QC procedures to be applied:	Please refer to Monitoring Plan
Calculation method:	Measure net GHG emissions
Any comment:	No large fires or events were detected in the project area

Data Unit / Parameter:	$\Delta\text{CUFdPA}_{(t)}$
Data unit:	t CO ₂ -e
Description:	Total decrease in carbon stock due to unplanned (and planned – where applicable) forest fires at

	year t in the project area
Source of data:	Fire monitoring reports from CEMEC
Description of measurement methods and procedures to be applied:	Satellite image analysis
Frequency of monitoring/recording:	At each verification period
Value applied:	n.a.
Monitoring equipment:	n.a.
QA/QC procedures to be applied:	Please refer to Monitoring Plan
Calculation method:	Measure net GHG emissions
Any comment:	No large fires or events were detected in the project area

Data Unit / Parameter:	ΔCUFiPA
Data unit:	t CO ₂ -e
Description:	Cumulative total increase in carbon stock due to unplanned (and planned – where applicable) forest fires in the project area
Source of data:	Fire monitoring reports from CEMEC
Description of measurement methods and procedures to be applied:	Satellite image analysis
Frequency of monitoring/recording:	At each verification period
Value applied:	n.a.
Monitoring equipment:	n.a.
QA/QC procedures to be applied:	Please refer to Monitoring Plan
Calculation method:	Measure net GHG emissions
Any comment:	No large fires or events were detected in the project area

Data Unit / Parameter:	$\Delta\text{CUFiPA}_{(t)}$
Data unit:	t CO ₂ -e
Description:	Total increase in carbon stock due to unplanned (and planned – where applicable) forest fires at year t in the project area
Source of data:	Fire monitoring reports from CEMEC
Description of measurement methods and procedures to be applied:	Satellite image analysis
Frequency of monitoring/recording:	At each verification period
Value applied:	n.a.

Monitoring equipment:	n.a.
QA/QC procedures to be applied:	Please refer to Monitoring Plan
Calculation method:	Measure net GHG emissions
Any comment:	No large fires or events were detected in the project area

Data Unit / Parameter:	Δ REDD
Data unit:	t CO ₂ -e
Description:	Cumulative net anthropogenic greenhouse gas emission reduction attributable to the AUD project activity
Source of data:	n.a.
Description of measurement methods and procedures to be applied:	Methodology VM0015 v1.1.
Frequency of monitoring/recording:	At each verification period
Value applied:	Table 36
Monitoring equipment:	n.a.
QA/QC procedures to be applied:	Please refer to Monitoring Plan
Calculation method:	According to methodology VM0015 v1.1. Table 36
Any comment:	n.a.

Data Unit / Parameter:	Δ REDD _(t)
Data unit:	t CO ₂ -e
Description:	Net anthropogenic greenhouse gas emission reduction attributable to the AUD project activity at year t
Source of data:	n.a.
Description of measurement methods and procedures to be applied:	Methodology VM0015 v1.1
Frequency of monitoring/recording:	At each verification period
Value applied:	Table 36
Monitoring equipment:	n.a.
QA/QC procedures to be applied:	Please refer to Monitoring Plan
Calculation method:	According to methodology VM0015 v1.1.
Any comment:	n.a.

Data Unit / Parameter:	RF_(t)
Data unit:	%
Description:	Risk factor used to calculate VCS buffer credits
Source of data:	VCS Non Permanence Risk analysis
Description of measurement methods and procedures to be applied:	AFOLU Non permanence Risk Tool v.3.2
Frequency of monitoring/recording:	At each verification period
Value applied:	10%
Monitoring equipment:	n.a.
QA/QC procedures to be applied:	Please refer to Monitoring Plan
Calculation method:	Non permanence Risk Tool v.3.2
Any comment:	Buffer calculation

Data Unit / Parameter:	VBC_(t)
Data unit:	t CO ₂ -e
Description:	Number of Buffer Credits deposited in the VCS Buffer at time t;
Source of data:	n.a.
Description of measurement methods and procedures to be applied:	Methodology VM0015 v1.1.
Frequency of monitoring/recording:	At each verification period
Value applied:	Table 36
Monitoring equipment:	n.a.
QA/QC procedures to be applied:	Please refer to Monitoring Plan
Calculation method:	According to methodology VM0015 v1.1.
Any comment:	Buffer calculation

Data Unit / Parameter:	VCU_(t)
Data unit:	t CO ₂ -e
Description:	Number of Verified Carbon Units (VCUs) to be made available for trade at time t
Source of data:	n.a.
Description of measurement methods and procedures to be applied:	Methodology VM0015 v1.1.
Frequency of monitoring/recording:	At each verification period
Value applied:	Table 36

Monitoring equipment:	n.a.
QA/QC procedures to be applied:	Please refer to Monitoring Plan
Calculation method:	According to methodology VM0015 v1.1.
Any comment:	Buffer calculation

CM4.1 Community Parameters

Data / Parameter	Cooperation agreements signed
Data unit	Number of cooperation agreements signed
Description	Cooperation agreements signed with communities for the conservation of the Park
Value monitored	No new agreements signed
Method	Data record

Data / Parameter	Communities boundaries
Data unit	Definition and demarcation of communities boundaries
Description	Georeference and define communities boundaries
Value monitored	Communities that have defined boundaries are La Técnica Agropecuaria, La Lucha, Unión Maya Itzá, Manantialito, Pozo Azul, San Juan Villa Nueva, Villa Hermosa, Las Victorias, Guayacán, Retalteco, Nueva Jerusalén II
Method	Data record

Data / Parameter	Assessment of compliance of the agreements
Data unit	Percentage of progress of activities
Description	Every three years evaluate the progress of the commitments by communities
Value monitored	This indicator will be evaluated every three years. The results will be shown in the next monitoring report
Method	Data record

Data / Parameter	Patrols conducted and participants
Data unit	Number of patrols conducted and participants
Description	Biodiversity monitoring and surveillance patrols
Value monitored	768 patrols conducted
Method	Data record and MIRA application

Data / Parameter	Emergencies detected
Data unit	Number of emergencies detected
Description	Emergencies could be fire, catastrophic events, biodiversity, social
Value monitored	3 earthquakes recorded
Method	Data record and MIRA application

Data / Parameter	Fire workshops undertaken at the communities
Data unit	Number of fire workshops undertaken at the communities
Description	Train communities in fire management
Value monitored	20 workshops
Method	Data record and MIRA application

Data / Parameter	Forest fire prevention in communities
Data unit	Early warning system for forest fire prevention in communities
Description	Train communities in fire management
Value monitored	20 workshops with an impact on 64 031.38 ha controlled
Method	Data record and MIRA application

Data / Parameter	Cleaning of firebreaks
Data unit	Number of annual cleaning of firebreaks in communities
Description	Train communities in fire management
Value monitored	3 annual cleaning
Method	Data record

Data / Parameter	Reports of biodiversity
Data unit	Number of endangered species recorded
Description	Management of endangered species
Value monitored	39 jaguars, 114 tapirs and 123 peccaries
Method	Data record and MIRA application

Data / Parameter	Capacitation workshops for the personnel and
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	professionals of the SLNP in practices for a sustainable agriculture
Data unit	Number of capacitation workshops
Description	Capacitation workshops for the personnel and professionals of the SLNP in practices for a sustainable agriculture
Value monitored	4 training
Method	Data record

Data / Parameter	Farmers trained in conservation agriculture
Data unit	Number of community agricultural plots
Description	Number of community agricultural plots in which it is effectively implemented
Value monitored	The results will be shown in the next monitoring report
Method	Data record and MIRA application

Data / Parameter	Crops that has been included in the program for sustainable agriculture
Data unit	Productivity/ha/household
Description	Productivity/ha/household of a given crop that has been included in the program for sustainable agriculture
Value monitored	The results will be shown in the next monitoring report
Method	Data record and MIRA application

Data / Parameter	Hectares of deforestation needed per household/year
Data unit	Number of hectares of deforestation needed per household/ year
Description	Quantify deforested hectares
Value monitored	The results will be shown in the next monitoring report
Method	Data record

Data / Parameter	Alternative NTFPs identified
Data unit	Number of alternative NTFPs identified
Description	Non timber forest products identified to increase the value chain
Value monitored	Enrichment and reforestation of forest areas in three cooperatives
Method	Data record

Data / Parameter	Forest nurseries and number of used species
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Data unit	Number of forest nurseries and number of used species
Description	Quantify production plants
Value monitored	3 agroforestry nurseries / 5 species
Method	Data record

Data / Parameter	Communities included in the census of populations of flora/fauna that have historically been subject to commercial extraction
Data unit	Number of communities included in the census of populations of flora/fauna that have historically been subject to commercial extraction
Description	Community participation
Value monitored	The results will be shown in the next monitoring report
Method	Data record

Data / Parameter	Approved sustainable forest management plans
Data unit	Number of approved sustainable forest management plans
Description	Community management plans
Value monitored	1 Forest Management Plan – La Lucha cooperative
Method	Data record and MIRA application

Data / Parameter	Micro credits awarded
Data unit	Number of micro credits awarded and number of micro credits re-paid timely
Description	Micro credits for inhabitants
Value monitored	20 women beneficiaries for 2011 – 2012 (first phase) and 13 beneficiaries in 2012 (7 women and 6 men – second phase)
Method	Data record

Data / Parameter	Persons contracted by the SLNP at a fix basis (not seasonal jobs)
Data unit	Number of persons contracted by the SLNP
Description	Persons working for SLNP
Value monitored	14 persons with permanent contract for 2014
Method	Contract

Data / Parameter	Minors participating of the REDD+ project
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Data unit	Number of minors under 15 participating of the project
Description	Minors benefiting from the project
Value monitored	No minors participating of the project for this monitoring period
Method	Data record

Data / Parameter	Direct women beneficiaries
Data unit	Number of women beneficiaries
Description	Women benefiting from the project
Value monitored	54 women
Method	Data record and MIRA application

Data / Parameter	Workshops in communities for the socialization of environmental legislation
Data unit	Number of workshops in communities for the socialization of environmental legislation
Description	Communities with knowledge of environmental legislation
Value monitored	14 workshops
Method	Data record and MIRA application

Data / Parameter	Environmental education training and lectures
Data unit	Number of women/ men/ youth participants
Description	Communities with knowledge of environmental education
Value monitored	334 women / 1 043 men / 65 youth participants
Method	Data record and MIRA application

Data / Parameter	Capacity building and governance in REDD
Data unit	Number of women/ men participants
Description	Workshops developed by FDN to strengthen community capacities and work together for the conservation and sustainable management of the SLNP
Value monitored	508 women / 1 613 men participants
Method	Data record and MIRA application

Data / Parameter	Cases of non-compliance with applicable laws per
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	community (for example: logging without a permit)
Data unit	Number of penalties
Description	Activities not regulated by law
Value monitored	There have been no non-compliance cases for this monitoring period
Method	Data record

Data / Parameter	Participants in the School of agroforestry promoters
Data unit	Number of persons trained in agroforestry
Description	School of agroforestry promoters for enhancing practices sustainable agriculture in the communities
Value monitored	11 agroforestry promoters trained
Method	Data record

Data / Parameter	Workshops about sexual and reproductive knowledge per community
Data unit	Number of workshops about sexual and reproductive knowledge per community
Description	Communities inform and with knowledge about sexual and reproductive education
Value monitored	31 lectures on family planning
Method	Data record

Data / Parameter	Workshops on correct use of water, management of human waste and use of latrines
Data unit	Number of workshops on correct use of water, management of human waste and use of latrines
Description	Improving health care
Value monitored	14 workshops on environmental education and sustainable production
Method	Data record

Data / Parameter	Communities that effectively manage to apply measures in case of non-compliance with applicable laws by any of its members
Data unit	Number of communities that effectively manage to apply measures in case of non-compliance with applicable laws by any of its members
Description	Management of non-compliance
Value monitored	There is no non-compliance, there are no corrective measures for this monitoring period
Method	Data record

Data / Parameter	Benefits of community groups
Data unit	Number of reports
Description	Improve the management of community groups
Value monitored	The results will be shown in the next monitoring report
Method	Data record

Data / Parameter	Benefits of community groups
Data unit	Number of reports
Description	Improve the management of community groups
Value monitored	The results will be shown in the next monitoring report
Method	Data record

B4.1 Biodiversity Parameters

Data / Parameter	Illegal settlements in the project area and leakage belt
Data unit	Number of hectares usurped by illegal settlements
Description	Monitoring of illegal settlements
Value monitored	4 950 ha
Method	GIS analysis and monitoring overflights

Data / Parameter	Illegal settlements in the project area and leakage belt
Data unit	Number of irregular camps detected for illegal extraction of flora, timber and wildlife
Description	Monitoring of illegal settlements
Value monitored	3 illegal settlements
Method	GIS analysis

Data / Parameter	Community biodiversity
Data unit	Hectares of forest conservation in community boundaries
Description	Monitoring management plans
Value monitored	448 ha
Method	GIS analysis

Data / Parameter	Community biodiversity
Data unit	Number of hectares loss per forest strata
Description	Monitoring deforestation
Value monitored	636.8 ha
Method	GIS analysis

Data / Parameter	Community biodiversity
Data unit	Number of hectares of forest loss habitats for HC1
Description	Monitoring area of threatened species
Value monitored	636.8 ha
Method	GIS analysis

Data / Parameter	Community biodiversity
Data unit	Reforestation hectares in community boundaries
Description	Monitoring management plans
Value monitored	45 ha
Method	GIS analysis

Data / Parameter	Community biodiversity
Data unit	Hectares with forestry enrichment
Description	Monitoring management plans
Value monitored	136 ha
Method	GIS analysis

Data / Parameter	Community biodiversity
Data unit	Hectares affected by forest fires per community per year
Description	Monitoring management plans
Value monitored	2012 La Lucha: 40 ha UMI: 37.32 ha La Técnica Agropecuaria: 25 ha 2013 La Lucha: 16 ha UMI: 0 ha La Técnica Agropecuaria: 10.5 ha 2014 La Lucha: 1 ha UMI: 0 ha La Técnica Agropecuaria: 3 ha
Method	GIS analysis

Data / Parameter	Frequency and intensity of forest fires
Data unit	Number of forest fires
Description	Monitoring management plans
Value monitored	2012 La Lucha: 2 UMI: 4 La Técnica Agropecuaria: 1 2013 La Lucha: 2 UMI: 0 La Técnica Agropecuaria: 1 2014 La Lucha: 0 UMI: 0 La Técnica Agropecuaria: 0
Method	Direct observation

Data / Parameter	Presence of endangered fauna
Data unit	Number of times Jaguar, Tapir and white-lipped peccary were observed in the project area
Description	Monitoring HCV1
Value monitored	39 jaguars, 114 tapirs and 123 peccaries
Method	Camera traps and direct observation

Data / Parameter	Presence of fauna
Data unit	Number of additional species observed
Description	Monitoring biodiversity fauna
Value monitored	22 species
Method	Camera traps and direct observation

Data / Parameter	Habitat available for Jaguar
Data unit	Percentage of the project area occupied by Jaguar
Description	Monitoring biodiversity fauna
Value monitored	51%
Method	Camera traps and direct observation (MIRA application)

Data / Parameter	Illegal activities in the project zone
Data unit	Number of people caught carrying xate extraction within the project area
Description	Monitoring biodiversity flora
Value monitored	1
Method	Report per patrol and MIRA application

Data / Parameter	Illegal activities in the project zone
Data unit	Number of people caught carrying hunting within the project area
Description	Monitoring illegal hunting
Value monitored	2
Method	Report per patrol and MIRA application

Data / Parameter	Illegal activities in the project zone
Data unit	Number of people caught carrying illegal logging within the project area
Description	Monitoring illegal logging
Value monitored	15
Method	Report per patrol and MIRA application

Data / Parameter	Illegal activities in the project zone
Data unit	Number of people caught carrying illegal fishing within the project area
Description	Monitoring illegal fishing
Value monitored	The results will be shown in the next monitoring report
Method	Report per patrol and MIRA application

Data / Parameter	Illegal activities in the project zone
Data unit	Number of people caught carrying illegal wildlife trafficking
Description	Monitoring illegal wildlife trafficking
Value monitored	3
Method	Report per patrol and MIRA application

6 QUANTIFICATION OF GHG EMISSION REDUCTION AND REMOVALS

6.1 Baseline Emissions

CL1.1 Total emissions in the baseline scenario for the project area and leakage belt are presented in Table 10 and Table 11. The overall baseline deforestation for this monitoring period is 2 048.84 ha for the project area and 7 580 ha for the leakage belt.

Table 10 Annual areas of baseline deforestation in the project area (Table 9.b VM0015 v1.1).

Project year t	Stratum i of the reference region in the project area 1 $ABSLPA_{1,t}$ ha	Total	
		annual $ABSLPA_t$ ha	cumulative $ABSLPA$ ha
2012	561.06	561.06	561.06
2013	781.47	781.47	1,342.53
2014	706.31	706.31	2,048.84

Table 11 Annual areas of baseline deforestation in the leakage belt (Table 9.c VM0015 v1.1).

Project year t	Stratum i of the reference region in leakage belt 1 $ABSLK_{1,t}$ ha	Total	
		annual $ABSLK_t$ ha	cumulative $ABSLK_{t,t}$ ha
2012	3,174.98	3,174.98	3,174.98
2013	2,075.58	2,075.58	5,250.56
2014	2,329.41	2,329.41	7,579.97

Table 12 Annual areas deforested per forest class icl within project area in the baseline case (baseline activity data per forest class) (Table 11.b VM0015 v1.1).

Area deforested per forest classes icl within the project area				Total baseline deforestation in the project area	
ID_{icl}	005	006	007	$ABSLPA_t$	$ABSLPA$
Name >	Broadleaved, sub-humid forest (BB-SH)	Broadleaved, medium-high, humid forest (BMA-H)	Broadleaved, medium-high, sub-humid forest (BMA-SH)	annual	cumulative
Project year t	ha	ha	ha	ha	ha
0	-	-	-	-	-
2012	-	561.06	-	561.06	561.06
2013	-	781.47	-	781.47	1,342.53
2014	-	706.31	-	706.31	2,048.84

Table 13 Annual areas deforested per forest class *icl* within the leakage belt in the baseline case (baseline activity data per forest class) (Table 11.c VM0015 v1.1).

Area deforested per forest classes <i>icl</i> within the leakage belt				Total baseline deforestation in the leakage belt	
<i>ID_{icl}</i> >	005	006	007	<i>ABSLLK_t</i>	<i>ABSLLK</i>
Name >	Broadleaved, sub-humid forest (BB-SH)	Broadleaved, medium-high, humid forest (BMA-H)	Broadleaved, medium-high, sub-humid forest (BMA-SH)	annual	cumulative
Project year <i>t</i>	ha	ha	ha	ha	ha
0				-	-
2012	5.05	3,081.32	88.60	3,174.98	3,174.98
2013	2.61	2,027.54	45.43	2,075.58	5,250.56
2014	-	2,281.58	47.83	2,329.41	7,579.97

Table 14 Baseline Carbon Stock Change

Total net carbon stock change <i>i</i> of the initial forest classes in the project area		
	$\Delta\text{CBSLP}_{\text{at}}$	$\Delta\text{CBSLP}_{\text{A}}$
	Annual	Cumulative
Project Yr	t CO ₂ e ha ⁻¹	t CO ₂ e ha ⁻¹
2012	194,832.8	194,832.8
2013	273,305.7	468,138.5
2014	249,903.1	718,041.6

6.2 Project Emissions

Ex post estimated net carbon stock change in the project area

CL2.1 Total *ex post* estimated carbon stock change in the project area under the project scenario for the present monitoring period is presented in Table 15.

Table 15 Annual areas deforested per forest class *icl* within project area in *ex post* (Table 11.b VM0015 v1.1).

Area deforested per forest classes <i>icl</i> within the project area				Total deforestation in the project area	
<i>ID_{icl}</i> >	005	006	007	<i>ABSLP_A_t</i>	<i>ABSLP_A</i>
Name >	Broadleaved, sub-humid forest (BB-SH)	Broadleaved, medium-high, humid forest (BMA-H)	Broadleaved, medium-high, sub-humid forest (BMA-SH)	annual	cumulative
Project year <i>t</i>	ha	ha	ha	ha	ha
2012	-	242.48	-	242.48	242.48
2013	-	294.24	-	294.24	536.73
2014	-	99.56	-	99.56	636.29

Table 16 Annual areas deforested per forest class *icl* within the leakage belt in ex post (Table 11.c VM0015 v1.1).

Area deforested per forest classes <i>icl</i> within the leakage belt				Total deforestation in the leakage belt	
<i>ID_{icl}</i>	005	006	007	<i>ABSLLK_t</i>	<i>ABSLLK</i>
Name	Broadleaved, sub-humid forest (BB-SH)	Broadleaved, medium-high, humid forest (BMA-H)	Broadleaved, medium-high, sub-humid forest (BMA-SH)	annual	cumulative
Project year <i>t</i>	ha	ha	ha	ha	ha
2012	6.66	1,244.07	-	1,250.73	1,250.73
2013	7.92	1,671.30	-	1,679.22	2,929.95
2014	1.80	1,021.32	-	1,023.12	3,953.07

Table 17 Ex post estimated net carbon stock change in the project area.

Total net carbon stock change of the initial forest classes in the project area		
$\Delta C_{totBSLPA,t}$		$\Delta C_{totBSLPA}$
Annual		Cumulative
Project Year	t CO ₂ e ha ⁻¹	t CO ₂ e ha ⁻¹
1	- 84,204.9	- 84,204.9
2	- 103,016.7	- 187,221.6
3	- 36,425.8	- 223,647.4

Non-CO₂ emissions from forest fires

Not subject to monitoring and accounting.

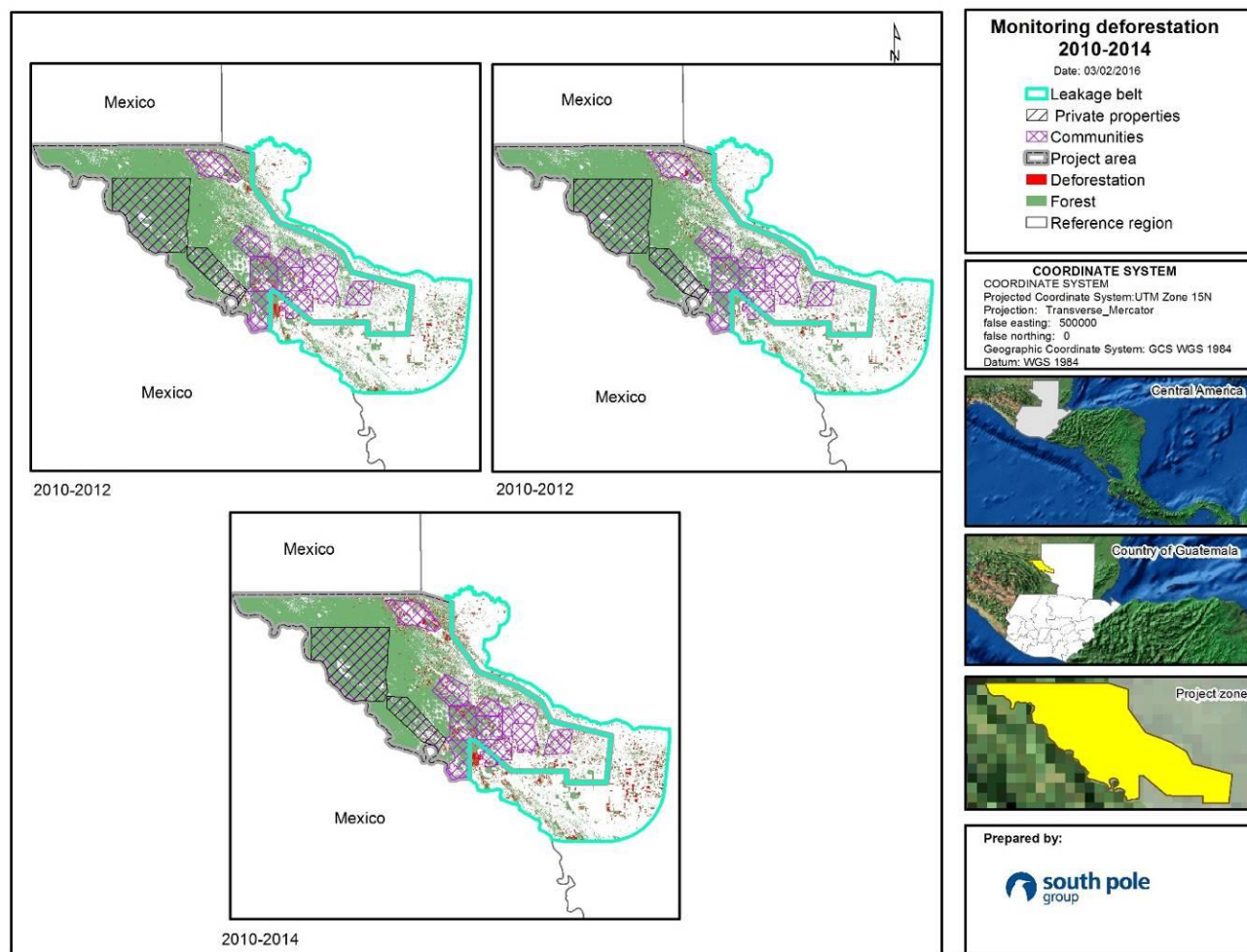


Figure 25 Deforestation monitoring report 2010 – 2014.

6.3 Leakage

Total ex post estimated leakage

CL3.1 The project does not consider a decrease in carbon stocks and increased emissions resulting from leakage prevention measures. Leakage is calculated as the difference between the *ex post* and *ex ante* values (deforestation above the baseline in the leakage belt area will be considered activity displacement leakage). As the result is < 0, total *ex post* leakage is zero.

It is not expected emissions from displacement since the areas of the first instance have legal land tenure. Mitigation measures employed are interinstitutional patrols.

Table 18 Total net ex ante and ex post carbon stock change in the leakage belt

project year	Total ex ante net baseline carbon stocks in leakage belt		Total ex post net actual carbon stock change in the leakage belt		Total ex post leakage	
	annual	cumulative	annual	cumulative	annual	cumulative
	ΔCbbABSLKK, t	ΔCbbABSLK K	ΔCbbABSLKK, t	ΔCbbABSLK K	ΔCbbABSLKK, t	ΔCbbABSLK K
	t CO ₂ e	t CO ₂ e	t CO ₂ e	t CO ₂ e	t CO ₂ e	t CO ₂ e
2012	-1,095,377.18	-1,095,377.18	-433,781.44	-433,781.44	0	0
2013	-727,399.53	-1,822,776.71	-586,781.50	-1,020,562.94	0	0
2014	-548,322.65	-2,371,099.35	-365,228.86	-1,385,791.80	0	0

CL3.2 The leakage management plan focuses on implement project activities in the non-forest areas. This project understands that leakage management is a very important component of the emissions reductions effectively achieved by the proposed activities. Therefore, the project will undertake leakage mitigation activities in the so-called leakage management areas. These activities aim to reduce the impacts of deforestation agents that will leave the project area in the project scenario to maintain their current activities, generating CO₂ emissions elsewhere. This project has considered leakage management activities that in some cases are coincident with activities that will be also implemented within the project zone as project activities.

Leakage mitigation strategies for the project include afforestation/reforestation activities, agroforestry, sustainable agriculture, silvopastoral systems and the establishment of forest patrols; all which improve socio-economic status and the strengthening of governance. Productive activities enable communities to have another source of income (not derived from illegal logging) and have access to certain commodities. The strengthening of local governance improves the ability of the community councils to manage local participation in project activities and to distribute effectively economic benefits. Finally, the presence of forest patrols discourage illegal logging in the leakage area that directly borders the project area boundaries (For detailed information, see Section 2.2).

CL3.3 While some publications⁴⁶ consider the leakage channels like land markets, labor markets, capital markets, technological innovation, output markets, income generation, ecological conditions, this project has calculated the amount of leakage based in the two sources of leakage detailed under the methodology VM0015.

1. Decrease in carbon stocks and increase in GHG emissions associated with leakage prevention measures:

- Leakage management measure would not occasion any decrease in carbon stocks or increases in GHG emissions. Protected Area category requires that land use be regulated. Within these regulations it is allowed to maintain and regulating existing livestock areas, but their expansion is prevented and monitored.
- Legal logging is permitted with forest management plans.
- The non-forest areas are the leakage management areas. The activities to be carried out in these areas are considered within the project activities prior signing conservation agreements.
- Non-forest classes presented in the areas of leakage management are the same class of non-forest present in the project area.
- The carbon stocks of leakage management areas are the same stocks from post-deforestation class.
- The project does not consider changes in carbon stocks within the management areas of leakage due to project activities.

Whence, decrease in carbon stocks and increase in GHG emissions associated with leakage prevention measures is excluded.

2. Decrease in carbon stocks and increase in GHG emissions associated with activity displacement leakage:

- Not significant reduction of carbon stocks and/or increase in GHG emissions occurred compared with the baseline scenario. Therefore, leakage emissions associated with the leakage prevention measures was not accounted and ex post monitoring will not be undertaken.

6.4 Summary of GHG Emission Reduction and Removals

CL2.2 The net anthropogenic GHG emissions reductions were calculated following the VM0015 methodology. The risk factor used to calculate VCS buffer credits is 10% as calculated in the Non-permanence risk tool. The calculated ex post GHG emissions reductions are presented in Table 19. It is used a discount per month at baseline because the monitoring period is until August and the project start day is in February. The VCU's tradable for the monitoring period are 369,982.0 tCO₂-e.

⁴⁶ Wunder, S., How do we deal with leakage? In: Angelsen, A. (ed.) 2008, Moving ahead with REDD: Issues, options and implications. CIFOR, Bogor, Indonesia. Available online at: http://www.cifor.org/publications/pdf_files/Books/BAngelsen0801.pdf

Table 19 Ex post estimated net anthropogenic GHG emission reductions and Verified Carbon Units (Table 36 VM0015 v1.1)

Project year t	Baseline carbon stock changes		Ex post carbon stock change		Ex post net anthropogenic GHG emission reductions		Ex post buffer credits (10%)		Ex post VCUs tradable	
	annual	cumulative	annual	cumulative	annual	cumulative	annual	cumulative	annual	cumulative
	$\Delta CBSLPA_t$	$\Delta CBSLPA$	$\Delta CPSPA_t$	$\Delta CPSPA$	$\Delta REDD_t$	$\Delta REDD$	VBC_t	VBC	VCU_t	VCU
	tCO ₂ -e	tCO ₂ -e	t CO2e	t CO2e	tCO ₂ -e	tCO ₂ -e	tCO ₂ -e	tCO ₂ -e	tCO ₂ -e	tCO ₂ -e
2012	194,832.8 ⁴⁷	194,832.8	84,204.9 ⁴⁸	84,204.9	110,627.0	110,627.0	11,062.7	11,062.7	99,564.0	99,564.0
2013	273,305.7	468,138.5	103,016.7	187,221.6	170,289.0	280,916.0	17,028.9	28,091.6	153,260.0	252,824.0
2014	166,602.1 ⁴⁹	634,740.6	36,425.8	223,647.4	130,176.0	411,092.0	13,017.6	41,109.2	117,158.0	369,982.0

⁴⁷ Baseline carbon stock change takes into consideration the Project start date (Please refer to PDD)

⁴⁸ Even though the project start date is 1 February 2012 (eleven months), annual deforestation is considered in order to take a conservative approach

⁴⁹ The figure was prorated due to the monitoring period ending in 24 August 2014

6.5 Climate Change Adaptation Benefits

GL1.1 Climate change causes extreme weather events. Guatemala is particularly vulnerable to the adverse effects of climate change⁵⁰. It expected the increasing of size and periodicity of natural phenomena such as storms and droughts, with effects on reduction of water availability and quality, displacement of pest, vectors, predators and diseases into new geographical areas, disturbances and blockages in the food chain; increased of forest fires by drought, loss of infrastructure; increased of food insecurity due to crop failure; destruction of natural habitats; negative impacts on all forms of human subsistence and reduction of soil quality (Ley Marco para regular la reducción de la vulnerabilidad, la adaptación obligatoria ante los efectos del cambio climático y la mitigación de gases de efecto invernadero)⁵¹.

The Climate Risk Index analyses to what extent countries have been affected by the impacts of weather-related loss events (storms, floods, heat waves etc.). In addition, indicates a level of exposure and vulnerability to extreme events that countries should understand as warning to be prepared for more frequent and/or more severe events in the future⁵². According to this report, Guatemala is the 9th country most affected in the 20 year period (Figure 26). Particularly in relative terms, poorer developing countries are hit much harder. These results emphasize the particular vulnerability of poor countries to climatic risks.

GL1.2 The increase in atmospheric temperature and sea, reduction and regime instability rainfall and sea level rise, further the intensification of weather phenomena extremes such as droughts and hurricanes will impact production, infrastructure, livelihoods, health and safety of the population, and that will weaken the ability of environment to provide vital resources and services. Due to its socio-economic conditions local communities will be implicitly forced to adapt to this changing climate. Their results show that, in a rather severe climate scenario, the value of land 30% for 2100 will be reduced. According to ClimateWizard, Guatemala by 2050 would have an increase on temperature of nearly 2 °C.

⁵⁰ Efectos del cambio climático afectan a Guatemala. 2016. El Periódico News. Available at <http://elperiodico.com.gt/2016/06/04/pais/efectos-del-cambio-climatico-afectan-a-guatemala/>

⁵¹ Congreso de la República Gt. Decreto Número 7-2013

⁵² Kreft, S *et al.* 2015. Global Climate Risk Index 2015. Available at <http://germanwatch.org/de/download/10333.pdf>

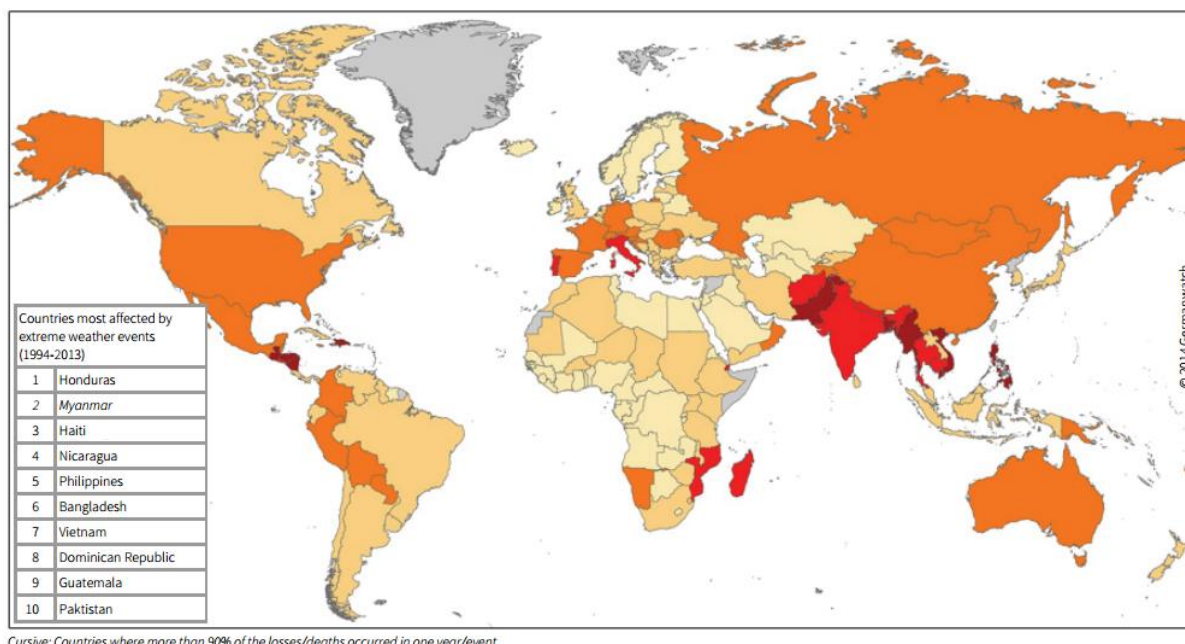


Figure 26 World Map of the Global Climate Risk Index 1994 – 2013

Source: Germanwatch and Munich Re NatCatSERVICE

Deforestation led to lower rainfall and higher temperatures. A recent study shows that in Guatemala temperatures will rise everywhere, with greater effects in regions of the upper lands and minor effect in coastal regions. These temperatures will lead to increased evapotranspiration stress, which could have negative effects to human activities, especially for agriculture⁵³.

Moreover, this means a reduction in precipitation in most of the country. Water resources for human consumption and other economic activities and biodiversity (especially the native flora and fauna), are very likely to suffer from a high level of stress in the future.

Guatemala presents a socio-economic environment in which one tenth (1/10) of the gross domestic product (GDP), two fifths (2/5) of the exports volume and almost half (1/2) of the work force available in the country is directly related to the agriculture sector, which is extremely vulnerable to changes in climate. The Economic Commission for Latin America and the Caribbean (ECLAC called CEPAL by its acronym in Spanish) has studied the vulnerability of the agricultural sector in Guatemala and has concluded that the economic impact of the climate change could represent a loss of 3-15% of the GDP by 2100⁵⁴. For the estimation the study was based on the recent climatic disasters that affected Guatemala, namely hurricane Mitch (year 1998) and the hurricane Stan (year 2005).

⁵³ Oglesby, R & Rowe, C. Informe Final: Impactos climáticos para Guatemala: Resultados preliminares de los modelos climáticos regionales y globales IPCC AR5.

⁵⁴ Mora et al., 2010. Available at http://repositorio.cepal.org/bitstream/handle/11362/25917/LCmexL963_es.pdf?sequence=1

It is expected that more than 50% of Guatemalan territory has changed its bioclimatic conditions policies by 2050, and over 90% for the 2080. Among the major impacts on ecosystems and biodiversity is expected the expansion of dry and very dry forest, which probably cover more than 65% of the territory in 2080. In parallel, humid, very humid and rain forests coverage will decrease from 80% to 60% by 2050 and less than 35% in 2080. This, added to the current deterioration of natural ecosystems coverage and high rates of deforestation leads a progressive and accelerated genetic erosion and simplification of natural ecosystems, in conjunction with high mortality rates, massive extinctions, mostly of endemic species and species of restricted distribution as well as of cloud forests and broadleaf forests in the lowlands. In the medium term (2050 - 2080), the effects of climate change and degradation of natural environment in Guatemala can mean the loss 50% or more of genetic diversity. Between the critical sites are the Mayan Biosphere Reserve and the Sierra de las Minas.

Warnings of the high probability of losing environmental services from associated ecosystems should be made, most importantly regarding the availability of water and the water cycle as it know it, the loss of biodiversity that has economic value and the positive feedback of the carbon cycle, or in other words, carbon release from ecosystems. It should note that Guatemala will change from being a country with abundant water to one with water deficiencies.

By 2050 is expected to increase temperature of 0.5 ° C to 2.5 °C, where a decrease in precipitation between 0-10% occur in the southern region, the western highlands, the departments of Huehuetenango and Iché, northern Baja Verapaz and West region of Alta Verapaz; and between 10% to 20%, in the central region (Chimaltenango, Sacatepequez and Guatemala). Therefore, drastic changes are expected in the territory, which can be expressed in new potential definitions of life. With this scenario, dry forests, where water deficit occurs, could occupy 40% of the national territory (Figure 27)⁵⁵.

⁵⁵ IARNA-URL (Instituto de Agricultura, Recursos Naturales y Ambiente de la Universidad Rafael Landívar). (2011). Cambio climático y biodiversidad. Elementos para analizar sus interacciones en Guatemala con un enfoque ecosistémico. Guatemala.

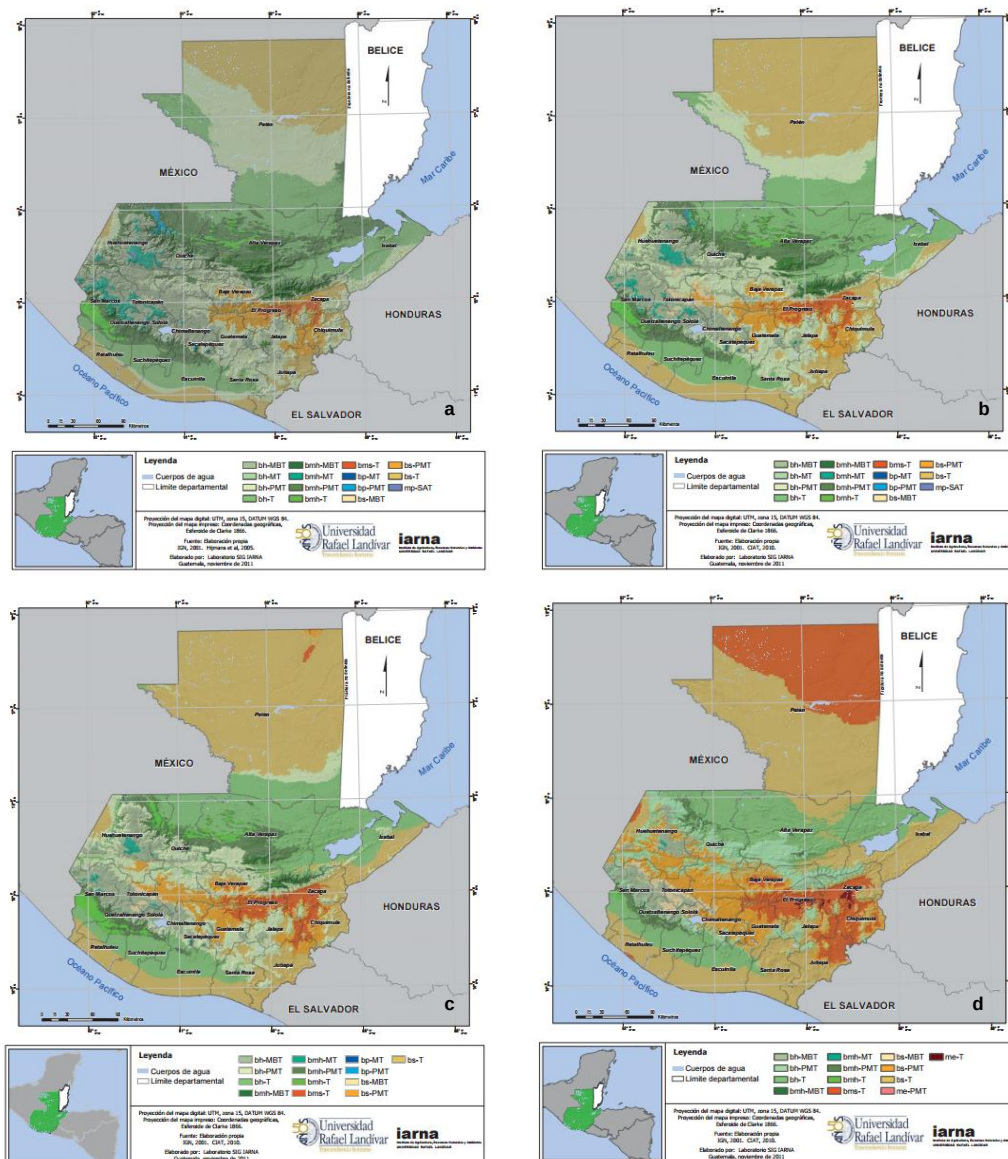


Figure 27 Scenario Modeling. a) Guatemala Life Zones (Holdridge). b) Life zone by 2020. c) Life zone by 2050. d) Life zone by 2080

GL1.3 In the absence of the Project, the rate of soil erosion and nutrient loss is likely to increase, which would lead to an increase the conversion of forest to agricultural land to compensate. The project explicitly addresses scenarios that are predicted with regard to climate change, for example, the selection of agricultural techniques that better conserve moisture and soil fertility. The increase in forest cover and sequestration of carbon in living biomass contribute to the reduction of greenhouse gas emissions by acting as sinks of CO₂.

Society's ability of coping with damages through precaution, mitigation and disaster preparedness, generally grows along with increasing economic strength. Observations over the past two decades of agricultural performance after extreme weather events have revealed that resilience to climate disasters is closely related to levels of biodiversity of farms⁵⁶.

The forest is the basis of livelihood of many families living in the SLNP. Among the main expectations of the community are to increase the efficiency of traditional agricultural production (corn, beans and pumpkin seeds), establish traditional agroforestry systems to allow for the provision of food for families, establishing intensive agroforestry systems that generate income by producing products for consistent markets, and the conservation of forests through incentive mechanisms.

Diversification is an important strategy for risk management in small agricultural production systems. In traditional agroecosystems the prevalence of complex and diversified systems is of great importance for the stability of farmers, allowing crops to reach acceptable productivity levels even under conditions of environmental stress. In general, traditional agro-ecosystems are less vulnerable to catastrophic loss because the wide variety of crops and varieties in various spatial and temporal arrangements compensate for loss.

Carlos Cifuentes (FDN), who is constantly in the field working with the communities in the SLNP, mentioned that, "while many community members do not know the technical concepts related to climate change, they are able to describe the changes in climate that they have observed over the years and their effects on agriculture, food security, and access to natural resources. The main change that community members perceive is the change in rainfall. People recognize that current dry and wet periods tend to be more intense than in previous years. This directly affects their agricultural activities, on which [these communities] depend for the vast majority of communities, as during the rainy seasons floods were recorded due to flooding of the Usumacinta River, a situation that had not previously been observed. In contrast, the dry periods are longer and more severe, affecting their crops. As well, heat is another factor that community members have identified as having changed. They are sure that the climate in their communities was once more "fresco" (cool), and now, it's hotter than it was before. They also recognize that they have contributed to this change through deforestation that they have caused and/or allowed and that this has negatively affected the microclimate of their communities."

For these reasons, two main project strategies: Sustainable farming and family livestock management systems & Diversification and use of communal forestry resources assist communities to adapt to probable impacts of climate change as many farmers use agroforestry arrangements, where use the cover of trees to protect crops against extreme fluctuations in microclimate and soil moisture. Farmers influence on the microclimate preserving and planting trees, which reduce the temperature, wind speed, evaporation, and direct exposure to sunlight.

⁵⁶ Altieri, M. Cambio climático y Agricultura Campesina: impactos y respuestas adaptativas.

In SLNP, agroforestry systems also play an important economic role through food production, generating additional revenue from the sale of surplus goods and reviving the sustainability of production models that have been lost through generational shifts. During the monitoring period, the project implemented a cumulative 33 ha of agroforestry systems in the San Juan Villa Nueva and Villa Hermosa communities. In addition, 14 environmental education and sustainable production workshops have developed and 11 agroforestry promoters have been trained.

On the other hand, the project strengthens decision-making and capabilities of communities, especially the operational capacity of forest adaptation through the workshop developed. Project activities will help reduce population vulnerability to food insecurity through implementation of alternative productive activities (See Section 7 for specific measures). Furthermore, with the implementation of environmental education, sexual and health workshops, along with patrols and forest conservation, sustainable forest management will be achieved.

GL1.4 This project's community enhancement and conservation activities will not be threatened by climate change, that is, they will not be more vulnerable than under any baseline scenario. Furthermore, the project strengthen the communities' capacity to cope with future climate change. We perceive our forest conservation efforts as an investment in ecosystem health, measure of climate change adaptation.

The complex nature of interactions between climate change and natural resources virtually ensures that over the lifetime of the project new risks will emerge; risks that have not yet been identified and anticipated. In addition, the project ensures that new impacts of climate change that emerge over the lifetime of the project will be recognized and appropriately addressed in the project management.

Indicators for Communities and Biodiversity have been included in the Monitoring Plan (Please refer to PDD). For monitoring result of project activities assisting communities and biodiversity to adapt climate change, please refer to Section 7 for Community records and Section 8 or Biodiversity records.

7 COMMUNITY

CM1.1 According to the International Strategy for Disaster Reduction (UNISDR, locally known as the “Estrategia Internacional para la Reducción de Desastres”) and data from the IPCC ANNEX I.8 e), the socio-environmental vulnerability of the country is reflected in the high levels of poverty (approximately 51% of the population in poverty and 15% in extreme poverty), 49% child malnutrition and a low Human Development Index (HDI). The population groups most impacted are the indigenous peoples, subsistence farmers, and small-scale fishermen, including women and children.

Guatemala, despite being the largest economy in Central America, is one of the countries with the highest levels of inequality in Latin America with high rates of poverty, particularly among rural and indigenous populations. It therefore has one of lowest HDI scores in Latin America⁵⁷.

Community general description:

G1.6 / CM1.1 The name and description of the cooperatives and private property areas identified where project activities will be implemented are detailed as follows:

La Lucha consists of areas which are private property of the community and are located in the “area of special use” of the SLNP. The forest cover in this land is significant, and forestry activities are regulated by an approved management plan. FDN has implemented activities in the community that focus on reforestation, forest enrichment, environmental, and health education among other factors.

La Técnica Agropecuaria is a community outside of the boundaries but in the Buffer Zone of the SLNP. The land is owned by several families that are organized in a cooperative scheme. They have previous experience in forest management. Fires due to agricultural expansion affected the area in 1998 and 2003. The community is very interested in eco-tourism, since they are located near the river that forms the border with Mexico and receive tourists from both the Guatemalan and the Mexican sides.

Unión Maya Itzá is a community consisting of a settlement and private forest areas with regular land ownership titles. The properties are located in the “area of special use” of the SLNP and have an updated forest management plan. FDN has traditionally pursued activities to publicize environmental and health issues.

Naranjitos and Centro Campesino are land areas owned by FDN in the “preservation area” of the SLNP. These private properties were bought by FDN in the late 1990s, when they had recently begun working in the SLNP.

⁵⁷ Gobierno de Guatemala. 2015. Contribución prevista y determinada a nivel nacional. Ministerio de Ambiente y Recursos Naturales. Disponible en: <http://www4.unfccc.int/submissions/INDC/Published%20Documents/Guatemala/1/Gobierno%20de%20Guatemala%20INDC-UNFCCC%20Sept%202015.pdf>

Brief Description of Cooperatives

Inhabitants

The oldest community is La Técnica, with the first settlers of this group arriving to this area in 1975. In 2010, Sutter crafted a detailed picture of the communities within Sierra del Lacandón National Park. In the case of UMI, its founding dates back to 1995. By 2008, this group had expanded to an estimated 6,200 hectares, 75% of which fall within the Park. La Lucha was founded in 1976, and by 2008, this group covered an area of 3,800 hectares, 100% of which found within the Park.

In terms of population, in 2008 UMI consisted of 1,042 people, with a density of 7.9 persons per caballería⁵⁸. Projections estimate that by 2018, the population will drop by 6% to 976 persons and a density of 7.4 persons per caballería. La Lucha consisted of 460 people in 2008 with a density of 5.3 persons per caballería. In contrast to UMI, its population is expected to increase 66% by 2018, for a total population of 764 and a density of 8.8 persons per “caballería”.

Land Ownership

In 2009, UMI did not hold illegally occupied or seized land. In terms of housing, 135 houses existed on the cooperative's lands and another twenty-five (25) houses were rented from their respective owners. La Lucha held eighty-five (85) houses on private lands and fifteen (15) houses on rented lands.

Incomes

Average salaries per day have increased from Q. 25.00 in 1998 to Q. 40.00 in 2009 (currently equivalent to Q 81.87). However, this increase has not kept pace with the increases in the cost of basic goods. In addition, farmers have endured additional cost burdens during this period due to increased reliance on agrochemicals as a result of decreased soil productivity. While nearby communities have more diverse economic activities such as tourism, raising of livestock, and commerce, the majority of households within the cooperative rely on agriculture.

Dwellings

In 2008, the majority of dwellings in the cooperatives consisted of galvanized sheet metal roofs, wooden walls, and earthen floors, although some homes were observed in a state of conversion to cement construction. In terms of sanitary services in the same year, ten out of ten families of Union Maya Itzá had toilets, as opposed to La Lucha, where only five of ten families had access to such services.

Water and Energy

With respect to water, the three cooperatives have piped water systems, though the water is not chlorine-treated and thus the population is at risk for gastrointestinal illness. For UMI, this water is sourced from a spring, while La Lucha sources its water from wells in each house.

All three cooperatives have access to electricity service, however, many homes are not electrified due to the low incomes of this region. Thus firewood sourced from nearby fallows serves as the main fuel for cooking.

Education

The three cooperatives currently have elementary schools. In 2008, 90% of UMI school-age children attended elementary school of ten teachers, with a student-teacher ratio of twenty-five to one (25:1). In that same year, 72% of UMI school-age children attended elementary school with two teachers, with a

⁵⁸ “Caballería” is a local measurement unit equivalent to 45 hectares.

student-teacher ratio of forty-five to one (45:1). UMI is the only cooperative that provides a complete basic education, with an institute of five teachers and around seventy students.

There is no university-level education within the cooperatives, and thus very few students have access to higher education. Those who do often are students with families in urban areas that can help facilitate housing during their studies.

Health

Social workers focused on health care exist within the cooperatives, known as “health promoters.” While the number of individual promoters has not changed between 1998 and 2008, the distribution of these workers has become more equitable, with each cooperative in the zone having access to at least one. The most common illnesses and diseases within the cooperatives are malaria, influenza, intestinal infections, and respiratory infections.

In 2008, UMI had four health promoters, three midwives, and one health center, while La Lucha had one health promoter, one midwife, and one Minimum Health Unit.

Ethnicity and Religion

In 2008, 40% of the UMI population belonged to the Q’echi’ ethnicity with the remaining 60% identified as “other” (currently, there are 9 different ethnicities). 30% were Catholic, 60% were Evangelical, and the remaining 10% did not subscribe to any religious community. For La Lucha, there is a fifty-fifty split between the Ladino and Q’echi’ ethnicities, and 50% were Catholic while the remaining 50% were Evangelical.

Community Organization and Institutional Presence

The UMI and La Lucha Cooperatives have an organization structure with auxiliary governments, Community Development Committees, Women’s Groups (just reactivated in La Lucha), Agricultural Committees, Forestry Committees, Health Committees, and Fire Committees.

Institutions present and working jointly with the communities for development include Pastoral Social, INAP, CONAP, ACOFOP, NPV, and mainly, Foundation Defenders of Nature (Fundación Defensores de la Naturaleza).

Knowledge of SLNP

In 2008, a series of surveys showed that zero out of ten knew of the park but did not know its limits. In La Lucha, nine out of ten knew of the park and were conscious of the need to conserve it whether or not the communities need the products or space occupied by the forest. FDN has played a key role in bringing this idea into the community consciousness and empowering community members with regard to the protection and conservation needs of the park through educational workshops, trainings, logistics, and projects to improve quality of life in harmony with the forest.

Access Roads

This has been the main limiting factor delaying the cooperatives’ access to basic services, in addition to complicating the viability of commerce and tourism. While there is a large, paved road, nearly half of the road leading to the cooperatives is unpaved. The conditions of the unpaved road worsen during the rainy season. From Santa Elena to UMI, 72 km of road are paved while another 70 km are unpaved. On the road that leads to La Técnica, 72 km of road are paved while the remaining 88 km are unpaved.

Community groups

Women's Committee on Ramon (*Brosimum alicastrum*): Seed collection to provide economic opportunities for the benefit of women. The committee is composed of the participants in the ramon value chain - the women - and is charged with the organization said activity on behalf of the Cooperative.

ACOFOP (Asociación de Comunidades Forestales de Petén): This is a community-based association consisting of twenty-three rural and indigenous organizations. The association facilitates community forestry, guaranteeing that natural forests will be maintained in perpetuity in the Multiple Use Zone of the Maya Biosphere Reserve.

The main objective of ACOFOP is to improve the quality of life of forest communities through community forest management and by promoting social, ecological, economic and political sustainability in the Multiple Use Zone.

Pastoral Social of Petén: This is a religious organization that functions through the continuous and public action of the Catholic Church. The organization has knowledge and experience of the social and economic realities of life in these local populations, and it uses this perspective to define the most appropriate forms of intervention to transform and improve their situations. Actions are organized with communities through the parishes and various committees, which work directly with beneficiaries in order to respond to a diverse set of needs.

The Pastoral Social of Petén organizes six committees, which focus on the following topics: Human Rights, Human Migration (Refugees and Displaced Persons), Commission for Women, Commission for Health, Commission for Education, and the Coordination Commission.

Forest Monitoring Committee for Cooperative: The Monitoring Committee is the body responsible for the control and supervision of each Cooperative. This authority is responsible for examining the operations of the cooperative and verifying the sustainable use of natural resources, taking into account the approved management plans.

Young Promoters of Sexual and Reproductive Health: Young Promoters provides educational talks and half-day workshops in schools throughout the communities of Nueva Jerusalem, Guayacán, Manantialito, Pozo Azul, Villa Hermosa, San Juan Villa Nueva, La Técnica, Retalteco, La Lucha and Unión Maya Itza. An additional training is held for two consecutive days so that young people can gain a dynamic understanding of sexual and reproductive health. This training emphasizes and develops the capacity of youths to critically assess and reflect on the lifelong impacts and consequences of sexual decisions taken at an early age. Young people are trained to strengthen their confidence and self-esteem, with the aim of empowering participants to become leaders and create mini knowledge-transfer networks to inform other youths in their communities.

Community Tourism in La Técnica Agropecuaria Cooperative: Organized group composed by local young people. The main objective is to provide ecotourism services to Sierra de Lacandón National Park, including the archaeological site of Piedras Negras, Usumacinta River and the cooperative itself. This group is supported by ACOFOP and FDN.

CM1.3 The expected changes in the well-being and other conditions in the Communities in the without-project land use scenario are described in PDD Section 6.1.

7.1 Net Positive Community Impacts

CM2.1 The project has used the Participatory Rural Appraisal (PRA) in order to understand what are the most relevant aspects to archive sustainable development within the communities.

The analysis of the net benefits to the communities resulting from the project activity is organized around the Sustainable Livelihoods Approach (SLA). The SLA includes a framework for understanding the complexities of poverty and guiding principles for action. This framework is designed to center on people and the influences that affect how they can support themselves and their families.

The main objective related to community well-being is to promote the sustainable development of local communities living in the project area through productive activities adapted to local cultural, geographic, infrastructure and access to markets. The basic units of SLA analysis are livelihood assets, which are divided into five categories: human capital, social capital, physical capital, natural capital and financial capital. One of the key factors that affect access to livelihood assets is the vulnerability context. This idea incorporates into the analysis economic, political, technological trends, as well as shocks and seasonality.

The guiding principles of the SLA are:

- **Be people-centered.** SLA begins by analyzing people's livelihoods and how they change over time. The people themselves actively participate throughout the project cycle.
- **Be holistic.** SLA acknowledges that people adopt many strategies to secure their livelihoods, and that many actors are involved, including the private sector, ministries, community-based organizations and international organizations.
- **Be dynamic.** SLA seeks to understand the dynamic nature of livelihoods and what influences them.
- **Build on strengths.** SLA builds on people's perceived strengths and opportunities rather than focusing on their problems and needs. It supports existing livelihood strategies.
- **Promote micro/macro links.** SLA examines the influence of policies and institutions on livelihood options and highlights the need for policies to be informed by insights from the local level and by the priorities of the poor
- **Encourage broad partnerships.** SLA counts on broad partnerships drawing on both the public and private sectors.
- **Aim for sustainability.** Sustainability is important if poverty reduction is to be lasting.

The net impacts of the project on the communities both within and outside of the Sierra del Lacandón National Park (SLNP) have been positive. Since the beginning of the project, all work has been completed in conjunction with communities and cooperatives, from the definition, implementation, and execution of project activities to the determination of the benefits that these groups will receive.

There is a major difference between the cooperatives and the communities in the project zone. Cooperatives are democratic entities – autonomous and voluntary associations of voting members, each of whom has equal rights and obligations. In contrast, the communities lack official organizational bodies.

FDN has been promoting the implementation of alternative use models that employ sustainable forest management. The project activities have produced multiple benefits to the communities, which have extended well beyond the project area to reach the legal residents of the park.

The following table lists the communities and cooperatives along with various indicators for the project, such as the presence or availability of various services or infrastructure by 2014. The symbol (-) indicates that the listed attribute is absent, whereas the checkmark (✓) indicates that the attribute is present within that community or cooperative.

Table 20 Community information

No.	Community / Cooperative	Location within SLNP	Population	Ethnicity	Water infrastructure	Latrines	Electricity access	Primary school	High school	Diversified	Legality of land use
1	Villa Hermosa	100%	1428	Ladino	-	✓	✓	✓	✓	-	✓
2	San Juan Villa Nueva	100%	1445	Indigenous	-	✓	✓	✓	✓	-	✓
3	Pozo Azul	100%	1400	Indigenous	-	✓	✓	✓	-	-	✓
4	Arroyo Yaxchilán	100%	47	Ladino	✓	✓	✓	✓	-	-	-
6	Unión Maya Itza	80%	1140	Indigenous	-	✓	✓	✓	✓	✓	✓
7	La Lucha	100%	560	Ladino	-	✓	✓	✓	✓	-	✓
8	El Retalteco	65%	1645	Ladino	✓	✓	✓	✓	✓	-	✓
9	Técnica Agropecuaria	0%	621	Ladino	✓	✓	✓	✓	✓	-	✓
10	Manantialito	100%	462	Ladino	-	-	-	✓	-	-	-
11	El Pital	100%	190	Ladino	-	-	-	✓	-	-	-
12	Guayacán	100%	1093	Ladino	-	✓	-	✓	-	-	-
13	Nueva Jerusalén II	100%	608	Ladino	✓	✓	-	✓	-	-	-
14	El Esfuerzo	70%	819	Ladino	-	✓	✓	✓	-	-	-
15	Las Victorias	100%	240	Ladino	-	-	-	✓	-	-	-
	Total		11698		4	11	9	14	6	1	7
	Percentage (%)				29%	79%	64%	100%	43%	7%	50%

CM2.3 A rapid community assessment determined that 71.4% (ten communities) of the surveyed communities are located entirely within the park limits. The remaining 28.6% of communities are found to a lesser extent within the park, with a range from 0% to 80% of the respective populations residing in the park limits (Técnica Agropecuaria and the Unión Maya Itzá, respectively). Although the cooperative La Técnica Agropecuaria is not found within the park limits, it is found within the project area.

Table 21 Community impacts

Livelihood Asset		Net Effect	Comment
Human Capital	Health & Education	79% of monitored communities have latrines.	In many cases, they are beneficiaries of infrastructure projects carried out by government agencies or through international cooperation.
		64% of communities have access to electricity.	In addition to communities with electricity, a third or more possess a private electric plant.
		All communities have primary schools, and 43% of the sampled communities have secondary schools.	The number of students going to secondary school is lower, due to the need of adolescents to participate in farming and domestic work. In many families, income is not sufficient to cover school fees, transportation, uniforms, etc.
		31 lectures on family planning.	Workshops about sexual and reproductive health are held in communities.
	Knowledge and skills	14 workshops on environmental education and sustainable production.	Workshops were held in the communities of Poza Azul, Pital, Villa Hermosa, Settlement La Revancha, Nueva Jerusalén, and San Juan Villa Nueva and at La Lucha and UMI cooperatives.
	Forest resources	Agroforestry school benefited 11 people, who became agroforestry	Implementation of actions for the sustainable management of natural resources.

Livelihood Asset		Net Effect	Comment
		promoters. 14 workshops held on environmental education and sustainable production.	
		La Lucha cooperative successfully established its Management Plan for areas of forest protection in 2012. Technical advances are being made in a Forest Management Plan for Non-Timber Products for the same cooperative.	Planning the sustainable development of timber and non-timber resources within SLNP.
Social Capital	Community participation on the Governance Committee	Cooperatives participate in the decision making process through representation in the Governance committee and collaborate in the implementation of project activities in conjunction with FDN.	Some roles of the Governance committee are to approve the annual work plan and any instrument of project planning, build support for the project, define strategies, and approve the sale of carbon credits.
	Relationships	The project is managed through the "Project Governance Committee" that meets periodically and in which each entity has a representative with voting rights.	The committee is composed of one principal representative and one alternate representative from each Cooperative and by FDN, as private owners and project partners.

Livelihood Asset		Net Effect	Comment
Physical Capital	Infrastructure	No data for the monitoring period	Project activities will improve the infrastructure of the communities through greater access to investment funds.
	Access to markets	Women's Committee on Ramon (<i>Brosimum alicastrum</i>): Seed collection to provide economic opportunities for the benefit of women.	Development of value chains; product and market research.
Financial Capital	Employment	Manuel Icó and Irán Pop were hired to support the development of project activities after they completed the agroforestry course.	Development of local employment.
	Investment	In August 2012, the second round of the program started with 13 male and female participants.	The paramount goal of this is to offer the communities financial services with which sustainable alternatives for the development and the economic growth of the region can be generated and that are in line with the park's environmental protection objectives.

Description of communities

The total registered population of the Ladino and Indigenous ethnic groups during this monitoring period is 11,698. Suter and López-Carr (2010)⁵⁹ reported that for 2010, the estimated total population of these communities was 10,148 (not including data from Técnica Agropecuaria, El Pital, and Las Victorias), while the total population within the park was reported to be 17,690. The population increased by 2,450 during the monitoring period with respect to 2010, which represents a total increase of twenty-one percent (21%).

The ethnicity of a household is determined by the language of the head-of-household. According to the 2006-2010 Master Plan (Plan Maestro 2006-2010), in 2001, Ladinos comprised seventy-three percent (73%) of the park's population. According to Suter and Lopez-Carr (2010), in 2008, seventy-six percent (76%) of the population identified as Ladino. In 2014, in the surveyed populations, sixty-six percent (66%) of the total population considered themselves to be Ladino (Figure 28) while thirty-four percent (34%) considered themselves of indigenous ethnicity. The results of the rapid assessment indicated greater migration of Ladino people into the park.

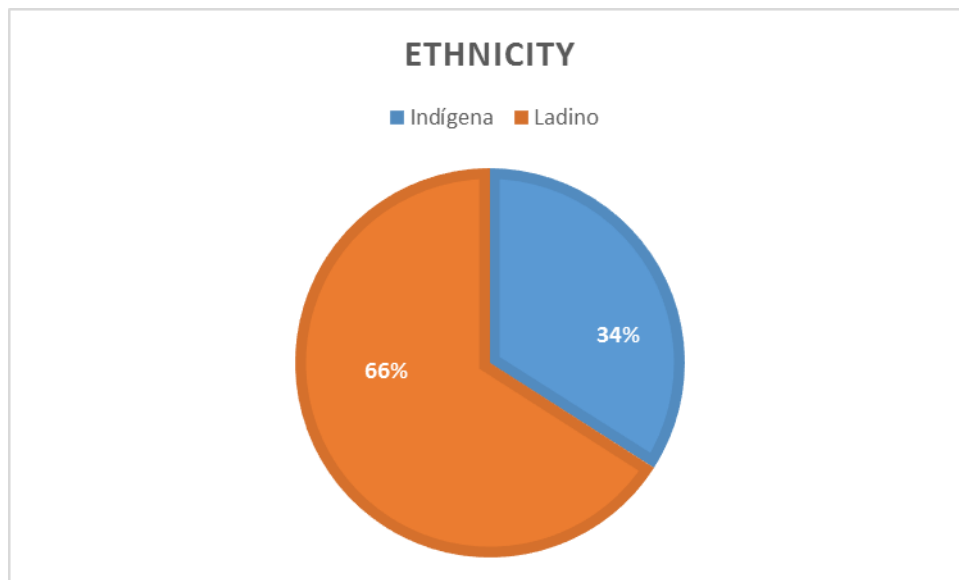


Figure 28 Population ethnicity

The main source of household water via the Bethel route is artesian wells, as opposed to piped water systems for the Naranja route. Access to water within the park is achieved through direct extraction from rivers, streams, and communal artesian wells. During the monitoring period, twenty-nine percent (29%) of communities were identified as having water infrastructure (Figure 29). Currently, very few communities depend on surface water sources, which are more likely to be contaminated. However, water support projects are still needed to satisfy the basic needs of the community, especially as the responsibility of fetching water for the home can interfere with children's ability to continue their

⁵⁹ Suter, L & López-Carr, D. 2010 El nivel de Desarrollo Humano en el Parque Nacional Sierra del Lacandón (The Level of Human Development in Sierra del Lancandón National Park). Available at: http://geog.ucsb.edu/~carr/wordpress/wp-content/uploads/2014/05/LaurelSuterDLC_20sept2010_PerfilFinal.pdf

education. Finally, a community's water source is a measure of the level of development of the community and the family economy and has a large impact on the health and wellbeing of a family.

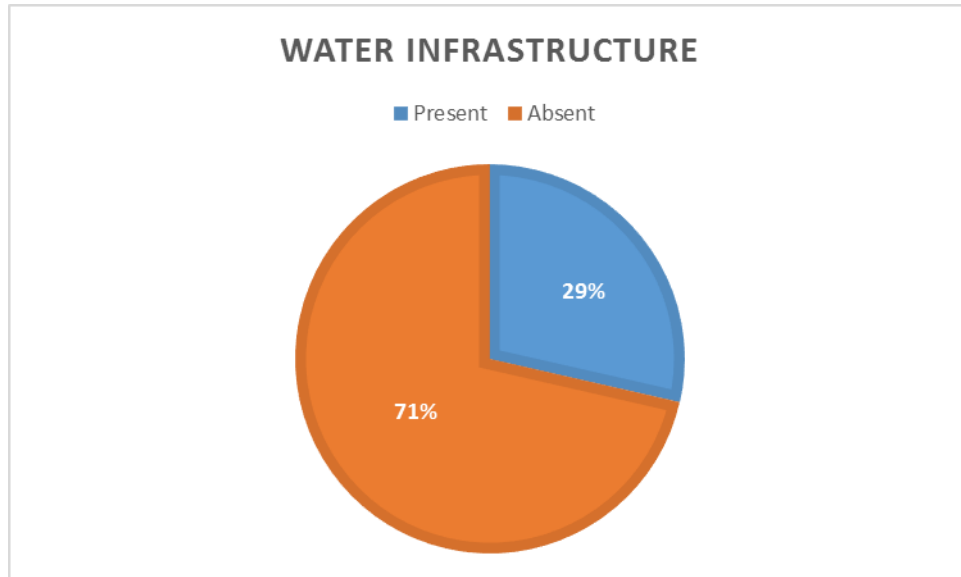


Figure 29 Communities with water infrastructure

For sanitation, the main methods used are latrines followed by direct discharge to the environment. In 1998, 16% of total communities in the park had latrines; in 2010 increased to 64%. By 2014, 79% of monitored communities presents latrines (Figure 30). In many cases they are beneficiaries of infrastructure projects of government agencies.

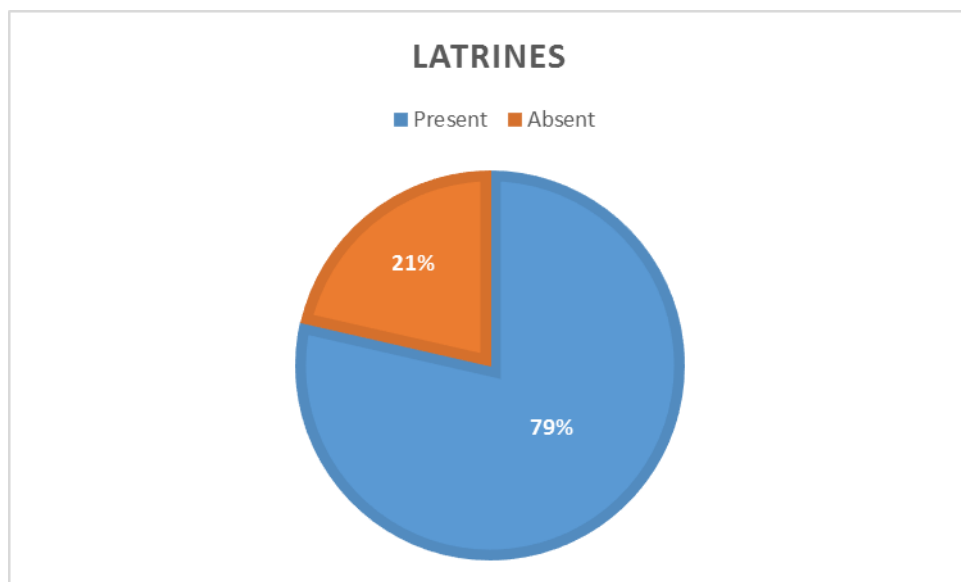


Figure 30 Communities with latrines

In 2001, eighty-four (84%) of the population along the Bethel route did not have access to electricity, seven-point-four percent (7.4%) owned a generator, and four percent (4%) had access to the public electricity utility. Along the Naranjo Border route, ninety percent (90%) lacked electricity, while 6% owned a generator and only point-one percent (0.1%) had access to the public energy utility. Within the PNSL, ninety-seven percent (97%) lacked access to electricity while the remaining three percent owned generators (Ramos, 2001).

In 2010, all of the Bethel route communities had electricity. However, not every house was found to be connected to the grid, and some of the families living in connected houses were unable to pay for electricity. On the other hand, none of the Naranjo route communities had electricity. In addition to communities with electricity, a third or more possess a private electric plant, as is the case with Villa Hermosa, Kilómetro 107, and Lagunitas.

Currently, sixty-four percent (64%) of communities have access to electricity (Figure 31); this includes communities such as Villa Hermosa, San Juan Villanueva, and Pozo Azul, which lie along the Naranjo route.

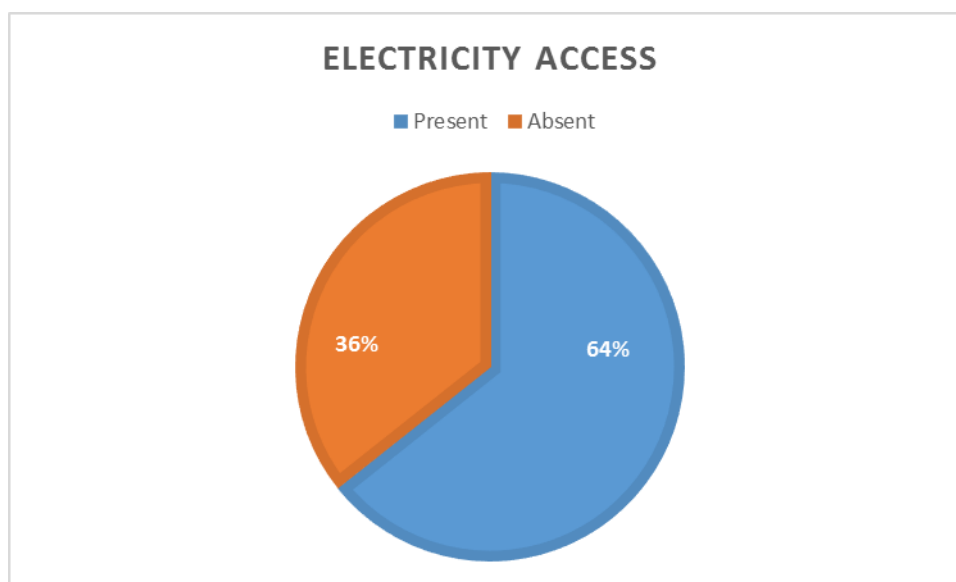


Figure 31 Communities with access to electricity

School opportunities have improved considerably between 1998 and 2008. In 1998 four communities did not have schools, and four communities had schools but without teachers.

According to Ramos (2001), 46% of the population of the Bethel route did not have any education, 32% were studying between first and third grade. For Naranjo route, 53% did not have any education, and 31% were studying between first and third grade. Regarding the SLNP communities, 59% did not have any education and 32% were studying between first and third grade.

By 2008, all communities have primary schools and teachers, nine communities offer some form of basic studies, whether a school or accompaniment of elementary teachers after school classes. The percentage of primary school attendance is between 50% and 100% by communities, while the number of students going to secondary school is less due to the labor of adolescents is needed in farming and

domestic, and in many families the income is not enough for school fees, transportation, uniforms, among others.

By 2014, all communities have primary schools (Figure 32), however; not all present secondary schools. Only 43% of the sampled communities have secondary schools (Figure 33); and 7% have Diversified secondary⁶⁰ (Figure 34).

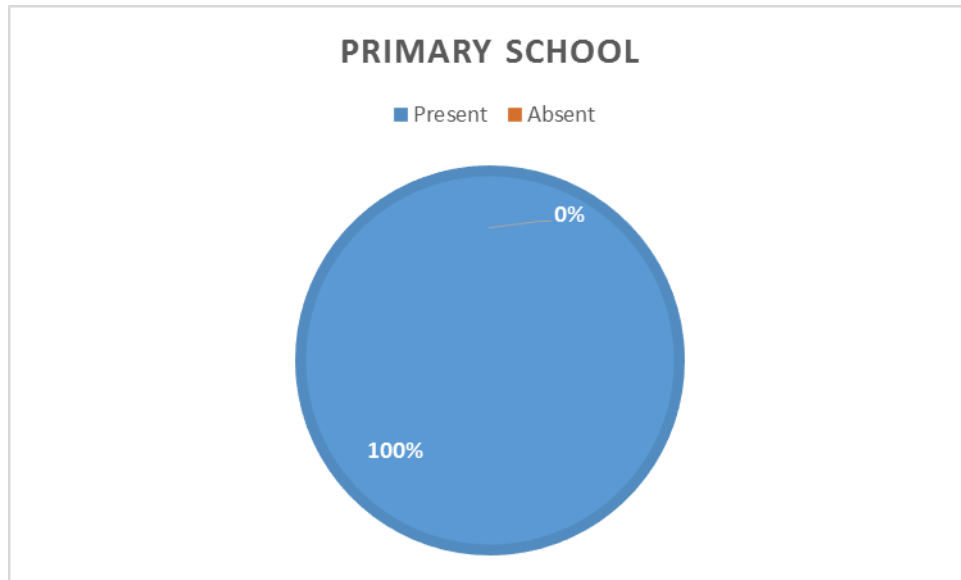


Figure 32 Communities present Primary Schools

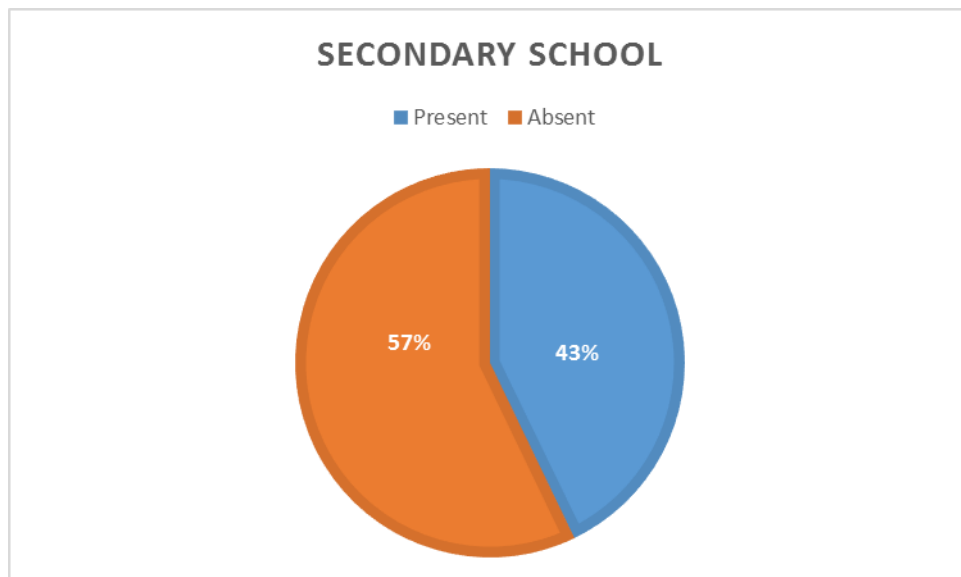


Figure 33 Communities present Secondary Schools

⁶⁰ Certificate/Diploma awarded: Bachillerato. Bachillerato is a prerequisite for access to university education.

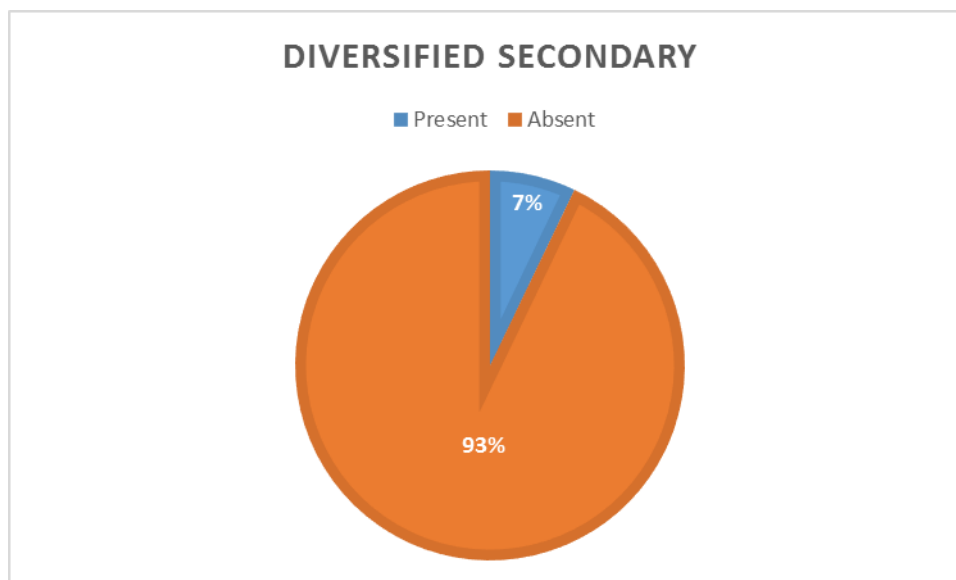


Figure 34 Communities present Diversified Secondary

For PNSL, there are two classes of land ownership: nationally owned lands and private property. National lands constitute the majority of PNSL (70-80%). Privately owned lands are concentrated in the southern and southeastern portions of the park.

In 2010, 170 farms of various legal status existed within the legal limits of PNSL: 26% Titled, 6% Publicly Registered, 10% Approved and/or Requested, 35% Tenured, 18% No Information, 2% Rescinded, 1% In Litigation, and 2% Communally Managed Units.

In the same year, the most significant land tenure status was rented land, which comprised 38% of the park. The communities of the Bethel route had the most secure land tenure, having benefited from settlement policies of the National Economic Development Corporation of Petén (FYDEP) or the repatriation policies of Guatemalan refugees in Mexico. Along the Naranjo route, there is a growing tendency for the sale of “legalized” plots – those “grabbed” from old landholders within the park, which has resulted in the accumulation of land by speculators and invasion into protected areas by “campesinos” (rural inhabitants, often farmers). The actions of the latter are either driven by the need for means of subsistence or for speculation.

By 2014, fifty percent (50%) of the sampled communities were the legal inhabitants of the land on which they lived. The legal status of Manantialito, El Pital, and Arroyo Yaxchilán has advanced significantly upon the signing of permanent residence agreements in 2015 (Figure 35).

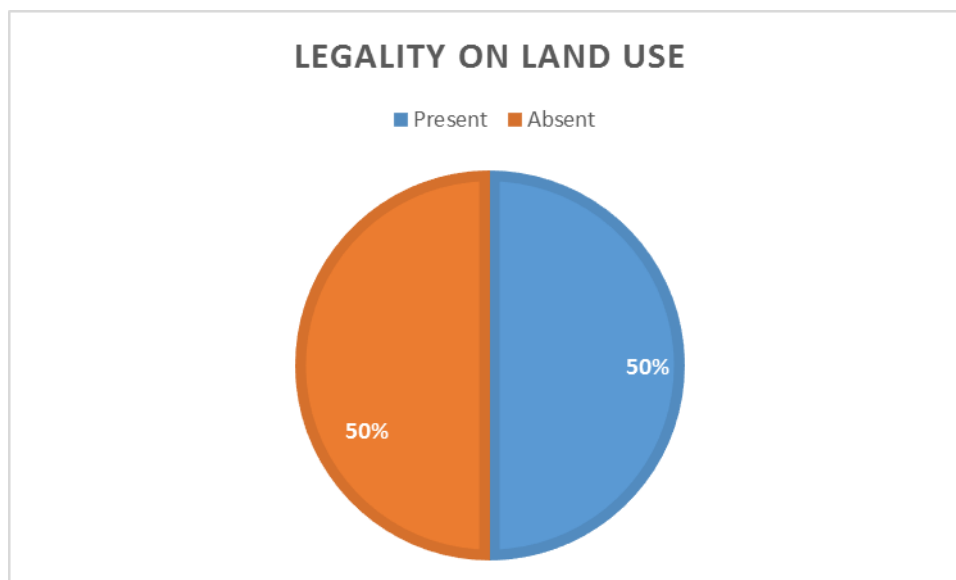


Figure 35 Communities with legality on land use

Signing and Execution of Conservation Agreements

According to the Law of Natural Protected Areas, *“individuals or organizations settled within protected areas, or whom, in the future, obtain legal declaration, must obtain permanence agreements in accordance with the conditions and rules of operation and the use and zoning of the area in question, ensuring their full incorporation in the planned management of said.”*

On June 20, 2011, the interinstitutional team was confirmed in Petén with the charge to consult, negotiate, endorse, and monitor the implementation of the cooperation agreements with the communities settled within Sierra del Lancandón National Park. This team is integrated by CONAP, Secretaría de Asuntos Agrarios (SAA), Fundación Defensores de la Naturaleza (FDN), La Libertad Municipality and Pastoral Social of Santa Elena and La Libertad, which are responsible for advising communities. The cooperation agreements allow for the regulation of the legal status of the land occupation of the communities, reduce social conflicts, and thus allow for better environmental management of the territory.

These agreements have ensured that the communities will be the managers that guard their territory, living sustainably with their natural surroundings. These technical legal documents guarantee their permanent stay in the park under the rules defined by the Master Plan of Sierra de Lancandón National Park for the areas in which the communities are established.

Table 22 Number of official document signed

Year	Community	Type of document
1997	San Juan Villa Nueva	Intention agreement
	Pozo Azul	Intention agreement
	Villa Hermosa	Intention agreement
2012	-	-
2013	-	-
2014	-	-

Communities are advised about the legal terms and freely and voluntarily signed cooperation agreements between the parties involved. By 2014 there are no new agreements signed (Table 22). FDN is working hard to legalize communities areas and preserve the forest areas of SLNP. Significant progress with Manantialito, El Pital and Arroyo Yaxchilan to sign cooperation agreements in 2015 to adequacy their permanence in the SLNP.

Experience has shown that clarification of land rights and the signing of cooperation agreements is a long and difficult process. Communities prefer the word "Perpetual" be included in the agreements, resulting in a great deal of coordination with the National Council of Protected Areas, whose legal department gives importance to legally correct terms.

Community limits

Efforts to define communities are reflected in reducing pressure on natural resources, promoting sustainable development and land use planning in the communities within the SLNP and its area of influence.

Communities that have defined boundaries are La Técnica Agropecuaria, La Lucha, Unión Maya Itzá, Manantialito, Pozo Azul, San Juan Villa Nueva, Villa Hermosa, Las Victorias, Guayacán, Retalteco, Nueva Jerusalén II (Figure 36).

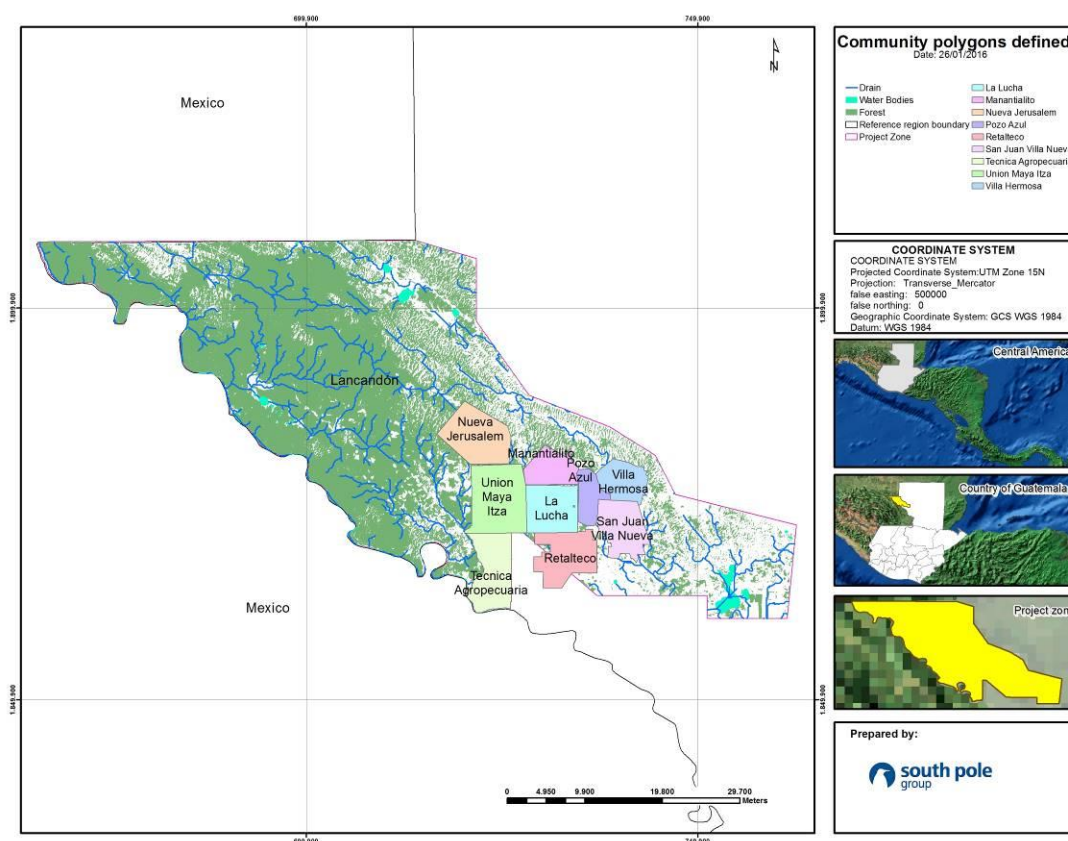


Figure 36 Defined community boundaries.

Assessment of compliance with the agreements

This indicator will be evaluated every three years. For this reason, the results will be shown in the next monitoring report.

Patrols conducted and participants

Between 2012-2014, 768 patrols were conducted in order to maintain interinstitutional presence and to detect deforestation or illegal acts that may occur in the protected area (Figure 37).

Table 23 Number of patrols conducted.

Year	Number
2012	245
2013	143
2014	380
Total	768

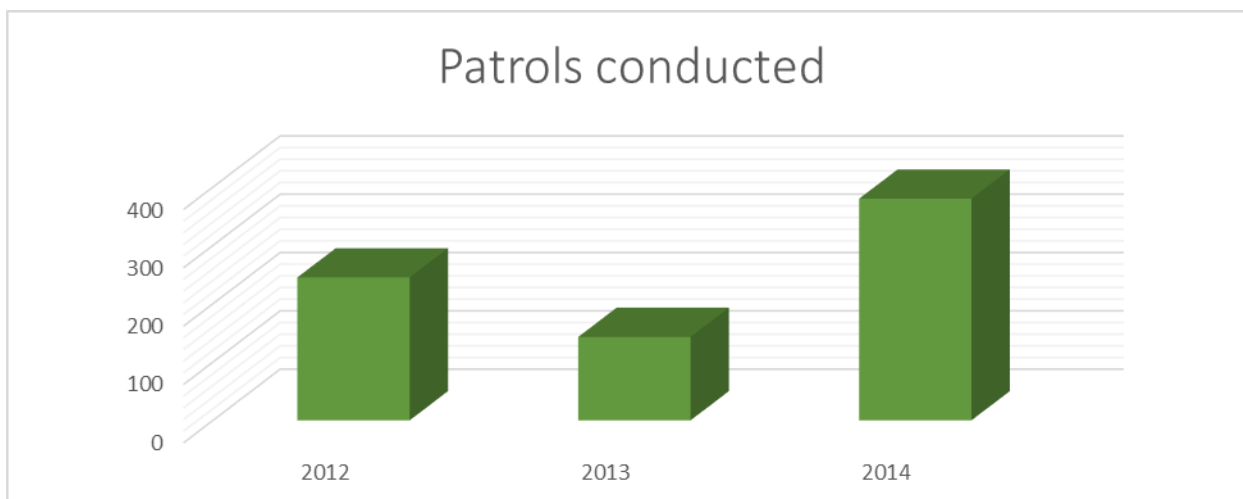


Figure 37 Patrols conducted between 2012 – 2014.

Emergencies detected

Emergencies are related to climate factors of the reference region. Therefore, the influential variables are⁶¹:

Temperatures have remained in a stable range in the 2008 – 2013 period, presenting an average maximum of 40.8°C and an average minimum of 10.8°C (Figure 38).

Table 24 Temperature in Petén.

Year	Minimum temperatures (°C)	Maximum temperatures (°C)
2008	10.4	41
2009	11	42
2010	9.4	41.8
2011	12	41
2012	12	39.4
2013	10.4	40

⁶¹ INE. Petén 2012 & INE. Petén 2013. Caracterización Departamental Petén.

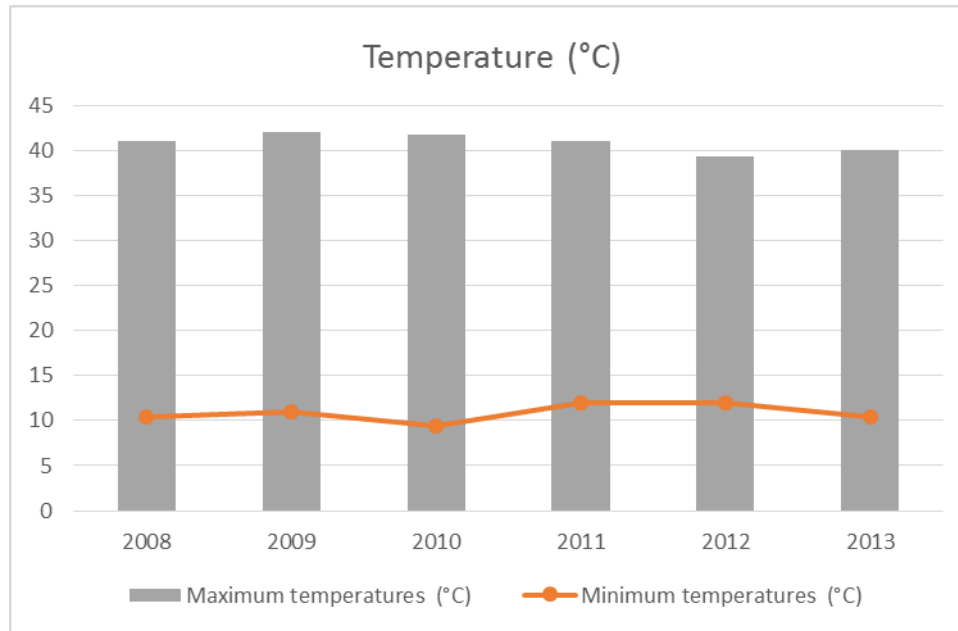


Figure 38 Temperature in Petén.

The relative humidity level has an average of 75.6%, with a maximum of 78% in 2013 and a minimum of 71.3% in 2011 (Figure 39).

Table 25 Relative humidity in Petén

Year	Relative humidity (%)
2008	75.8
2009	74.7
2010	77.3
2011	71.3
2012	76.5
2013	78.0

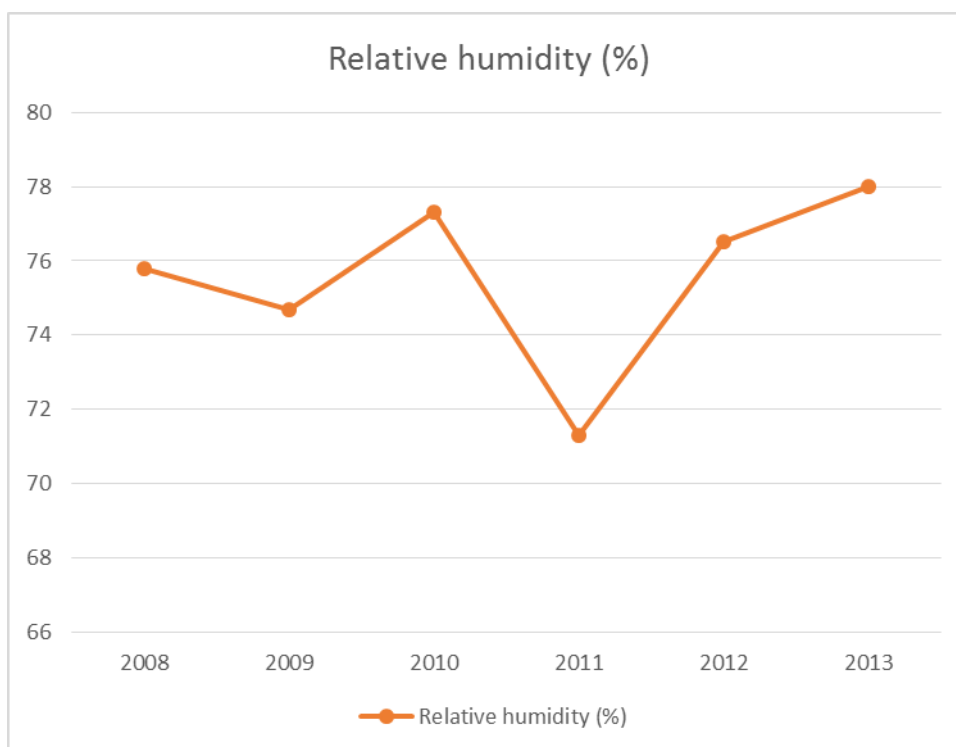


Figure 39 Relative humidity in Petén

In 2009, fewer natural disaster⁶² events were recorded. In 2008, 286 events were recorded in the Department of Petén (Figure 40).

Table 26 Total number of natural disasters in Petén

Year	Total number of natural disasters registered
2008	286
2009	40
2010	242
2011	248
2012	131
2013	200

⁶² Disaster: intense alteration in populations, goods, services, and/or the environment caused by a natural event or generated by human activity and which exceeds the response capacity of the affected community.

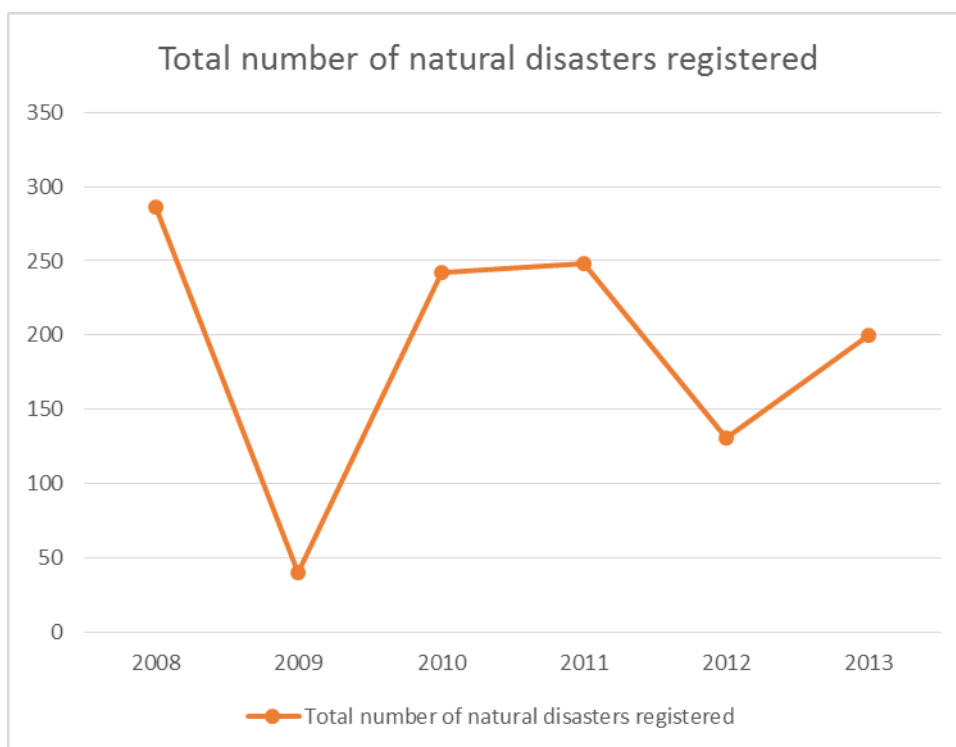


Figure 40 Natural disasters registered in Petén.

For the 2008 – 2013 period, a total of eight earthquakes occurred in Petén. In 2009, the highest estimate of the number of earthquakes with a total of four (4) (Figure 41).

Table 27 Earthquakes recorded in Petén.

Year	Earthquakes recorded
2008	0
2009	4
2010	1
2011	0
2012	0
2013	3

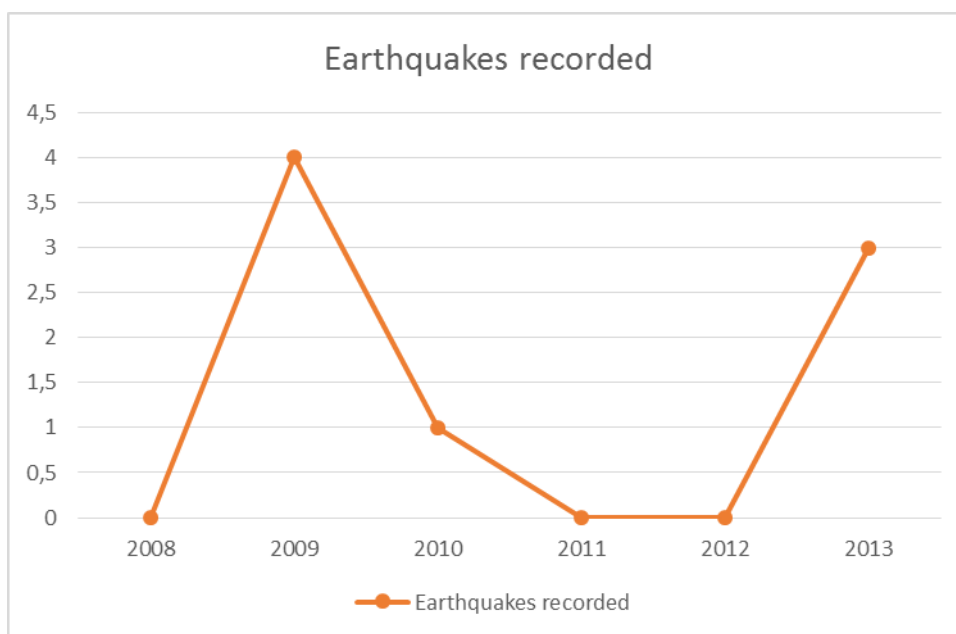


Figure 41 Earthquakes recorded in Petén.

The number of people affected by natural disaster in Petén is detailed below (Figure 42):

Table 28 People affected by disasters in Petén

Year	People affected by disasters from natural events
2008	31851
2009	1970
2010	32888
2011	20864
2012	5172
2013	4858

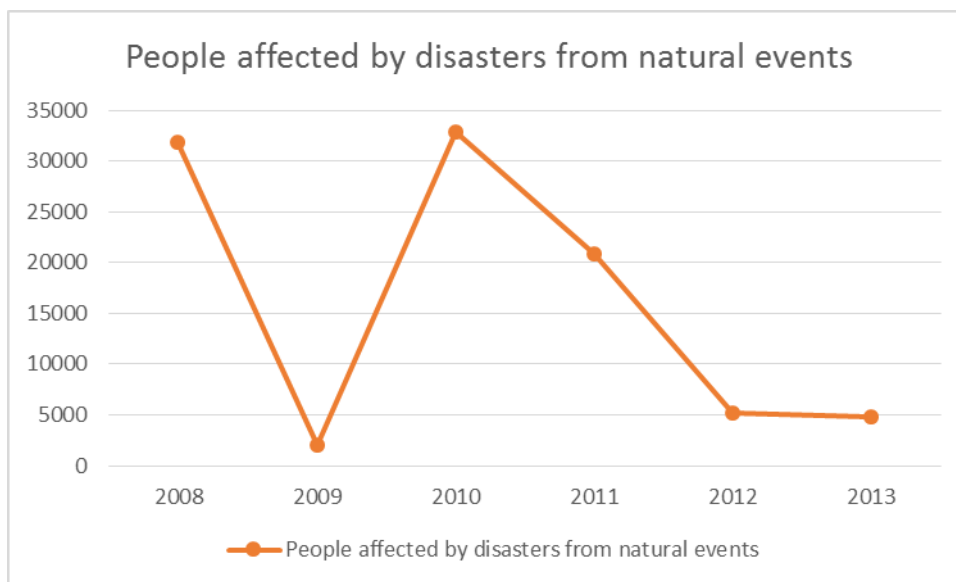


Figure 42 People affected by disasters in Petén.



Figure 43 (Left) & Figure 44 (Right) Pozo del Macho community affected by rains.

Workshops for the communities

Workshops were held in four categories: forest fires, environmental education, health, and community organization. The work was done in the communities Poza Azul, Pital, Villa Hermosa, Settlement La revancha, Nueva Jerusalén, San Juan Villa Nueva; and the cooperatives La Lucha y UMI.

The health area was begun in 2014 and includes educational workshops on sexual and reproductive health. It also includes talks on managing human waste and use of latrines and water management.

For the monitoring period, the number of attendees who are men is higher than the number who are women (Table 29). However, the number of female participants has increased significantly each year. By 2014, female workshop attendance reached 231.

Table 29 Number of persons participating for each workshop.

Year	Workshop theme	Number of events	Number of women	Number of men	Number of young people
2012	Forest fires	7	-	-	-
	Sustainable Production / Environmental Education	2	9	39	-
	Health	-	-	-	-
	Community organization	2	7	27	-
	Total	11	16	66	-
2013	Forest fires	5	21	32	16
	Sustainable Production / Environmental Education	5	38	140	-
	Health	-	-	-	-
	Community organization	10	46	207	-
	Total	20	105	379	16
2014	Forest fires	8	12	63	36
	Sustainable Production / Environmental Education	7	60	125	-
	Health	3	20	18	13
	Community organization	28	121	392	-
	Total	46	213	598	49

Evidence of different workshops conducted in the monitoring period:



Figure 45 (L) & Figure 46 (R) Environmental education workshops in Poza Azul and Villa Hermosa.



Figure 47 (L) & Figure 48 (R) Cleaning Workshop in Poza Azul and Forest Nursery in Villa Hermosa.



Figure 49 (L) & Figure 50 (R) Environmental education workshops in Villa Hermosa and Poza Azul.

In addition, community organization workshops were conducted to strengthen the decision-making and leadership capacities of the population as well as the available information and guidance on potential signing cooperation agreements and/or the monitoring of signed agreements (Figures below).



Figure 51 Exchange of experiences with Water Committees between Poza Azul and Villa Hermosa in El Naranjo (1).



Figure 52 Exchange of experiences with Water Committees between Poza Azul and Villa Hermosa in El Naranjo (2).

Also, photos from lectures on health, water management, and health education are displayed in the following figures:



Figure 53 (L) & Figure 54 (R) Training of Water Committees in Villa Hermosa, supported by INFOM.

Finally, records of various forest fire workshops conducted during the monitoring period showing the attendance of the communities.



Figure 55 (L) & Figure 56 (R) Training for prevention and control of forest fires in Manantialito.

Agroforestry promoters

The agroforestry school benefited 11 persons, who became agroforestry promoters. Manuel Icó and Irán Pop were hired after the training course for the development of project activities. Table 30 shows the promoters who benefited from the project and who formed the graduating class.

Table 30 Promoters benefited by the project.

Community / Cooperative	Name of promoter	Class	Follow-Up
Villa Hermosa	Oscar Gamaliel	2012-2013	
	Alex Ramirez	2012-2013	
San Juan Villa Nueva	Luciano Pop	2012-2013	
	Manuel Icó	2012-2013	Currently hired as promoter of water projects in communities Poza Azul and Villa Hermosa.
	Francisco Miss	2012-2013	
	Antonio Asig	2012-2013	
Unión Maya Itzá	Domingo Matiaz Pedro	2014-2015	
	Teodilio Matías Ramírez	2014-2015	
	Rodrigo Alberto Matías Pablo	2014-2015	
	Benedicto Poou Xol	2014-2015	

Prevention of Forest Fires in the Communities

With regard to this indicator, the implementation of the Wildfire Early Warning System (SATIF) in the communities is still being assessed, as communities prefer to strengthen forest fire brigades before putting SATIFs into effect. During the monitoring period, the following activities (Table 31) were developed to strengthen action against forest fires.

Table 31 Activities to control forest fires.

STRENGTHENING ACTORS IN DEVELOPMENT OF ACTION AGAINST FOREST FIRES WILDLIFE CONSERVATION SOCIETY								
No.	Strengthened Organizations / Communities	Municipality	Department	Advisor institution	Strengthening theme	2012	2013	2014
1	Guayacán	La Libertad	Petén	FDN-SLNP	Workshops: Basic Techniques for Forest Fire Control / Early Warning System FOR Forest Fire (SATIF) / Community plan for forest fire prevention	x	x	
2	La Lucha	Las Cruces / La Libertad	Petén	FDN-SLNP	Workshops: Basic Techniques for Forest Fire Control / Early Warning System FOR Forest Fire (SATIF) / Community plan for forest fire prevention	x	x	x
3	Unión Maya Itzá	Las Cruces	Petén	FDN-SLNP	Workshops: Basic Techniques for Forest Fire Control / Early Warning System FOR Forest Fire (SATIF) / Community plan for forest fire prevention	x	x	x
4	Villa Hermosa	La Libertad	Petén	FDN-SLNP	Forest fire prevention / Awareness and community organization for the prevention of forest fires / Basic Techniques of forest fire control for primary student / Community plan for forest fire prevention		x	x
5	Poza Azul	La Libertad	Petén	FDN-SLNP	Awareness and community organization for the prevention of forest fires / Basic Techniques of forest fire control for primary student / Community plan for forest fire prevention			x
6	San Juan Villa Nueva	La Libertad	Petén	FDN-SLNP	Awareness and community organization for the prevention of forest fires / Basic Techniques of forest fire control for primary student / Community plan for			x

STRENGTHENING ACTORS IN DEVELOPMENT OF ACTION AGAINST FOREST FIRES WILDLIFE CONSERVATION SOCIETY								
No.	Strengthened Organizations / Communities	Municipality	Department	Advisor institution	Strengthening theme	2012	2013	2014
					forest fire prevention			
7	Pital	La Libertad	Petén	FDN-SLNP	Awareness and community organization for the prevention of forest fires / Basic Techniques of forest fire control	x		x
8	Nueva Jerusalén II	La Libertad	Petén	FDN-SLNP	Early Warning System FOR Forest Fire (SATIF) / Awareness and community organization for the prevention of forest fires / Community plan for forest fire prevention		x	x
9	Military detachment Bethel	Las Cruces	Petén	FDN-SLNP	Workshops: Basic Techniques for Forest Fire Control			x
19	Manantialito	La Libertad	Petén	FDN-SLNP	Community Organization and Techniques of Forest Fire Control / Community plan for forest fire prevention			
20	Técnica Agropecuaria	Las Cruces	Petén	FDN-SLNP	Community plan for forest fire prevention			
21	San Miguel los Angeles	Las Cruces	Petén	FDN-SLNP	Community plan for forest fire prevention			
22	La Revancha	La Libertad	Petén	FDN-SLNP	Community plan for forest fire prevention			
23	El Ceibo	La Libertad	Petén	FDN-SLNP	Workshops: Basic Techniques for Forest Fire Control	x		
24	Grupo Arroyo Yaxchilán	Las Cruces	Petén	FDN-SLNP	Workshops: Basic Techniques for Forest Fire Control	x		
25	Military detachment El Subín	Las Cruces	Petén	FDN-SLNP	Workshops: Basic Techniques for Forest Fire Control	x		

Altogether, the workshops developed during the monitoring period to prevent forest fires had an impact on a total area of 64,031.38 ha, as presented in Table 32.

Table 32 Forest plans and areas controlled (ha) by the workshops.

No.	Plan / Strategic for Prevention and Fire Fighting	Advisor institution	Organizations / beneficiary communities	Areas controlled (ha) 2012	Areas controlled (ha) 2013	Areas controlled (ha) 2014
1	Annual Operating Plan for Integrated Fire Management. Sierra del Lacandón National Park, 2012	FDN-CONAP-CONRED-Ejército-DIPRONA	Community Guayacán	6,337.34		
2		FDN-CONAP-CONRED-Ejército-DIPRONA	Community El Ceibo			
3		FDN-CONAP-CONRED-Ejército-DIPRONA	Community El Pital	2,168.94		
4		FDN-CONAP-CONRED-Ejército-DIPRONA	Cooperative La Lucha	3,893.70		
5		FDN-CONAP-CONRED-Ejército-DIPRONA	Cooperative Unión Maya Itzá	5,665.24		
6		FDN-CONAP-CONRED-Ejército-DIPRONA	Community Arroyo Yaxchilán			
7		FDN-CONAP-CONRED-Ejército-DIPRONA	Military detachment El Subín			
1	Annual Operating Plan for Integrated Fire Management. Sierra del Lacandón National Park, 2013	FDN- CONAP - ACOFOP - SIPECIF - Municipality La Libertad - Municipality Las Cruces	Community Guayacán		6,337.34	
2		FDN- CONAP - ACOFOP - SIPECIF - Municipality La Libertad - Municipality Las Cruces	Community Nueva Jerusalem II		4,952.42	
3		FDN- CONAP - ACOFOP - SIPECIF - Municipality La Libertad - Municipality Las Cruces	Cooperative La Lucha		3,893.70	
4		FDN- CONAP - ACOFOP - SIPECIF - Municipality La Libertad - Municipality Las Cruces	Cooperative Unión Maya Itzá		5,665.24	
5	Annual Operating Plan for	FDN- CONAP - ACOFOP -	Cooperative La Lucha			3,893.70

No.	Plan / Strategic for Prevention and Fire Fighting	Advisor institution	Organizations / beneficiary communities	Areas controlled (ha) 2012	Areas controlled (ha) 2013	Areas controlled (ha) 2014
	Integrated Fire Management. Sierra del Lacandón National Park, 2014	SIPECIF - Municipality La Libertad - Municipality Las Cruces				
6		FDN- CONAP - ACOFOP - SIPECIF - Municipality La Libertad - Municipality Las Cruces	Cooperative Unión Maya Itzá			5,665.24
7		FDN- CONAP - ACOFOP - SIPECIF - Municipality La Libertad - Municipality Las Cruces	Community Villa Hermosa			2,723.48
8		FDN- CONAP - ACOFOP - SIPECIF - Municipality La Libertad - Municipality Las Cruces	Community Poza Azul			1,916.08
9		FDN- CONAP - ACOFOP - SIPECIF - Municipality La Libertad - Municipality Las Cruces	Community San Juan Villa Nueva			3,797.60
10		FDN- CONAP - ACOFOP - SIPECIF - Municipality La Libertad - Municipality Las Cruces	Community El Pital			2,168.94
11		FDN- CONAP - ACOFOP - SIPECIF - Municipality La Libertad - Municipality Las Cruces	Community Nueva Jerusalén			4,952.42
12		FDN- CONAP - ACOFOP - SIPECIF - Municipality La Libertad - Municipality Las Cruces	Military detachment Bethel			x
			Total per year	18,065.22	20,848.70	25,117.46

Maintenance of Firebreaks

The communities have been trained in forest fire management and how to maintain firebreaks at both a community and institutional level. Maintenance of firebreaks is conducted once per year in the fire season, between February and May. The communities are in charge of maintaining and cleaning their firebreaks. Sometimes, when possible, FDN and other institutions help with maintenance, however, the majority must do so of their own accord. The red line in the Figure 57 shows the limits of the cooperatives and the maintenance of their firebreaks with an extension of 50.5 km.

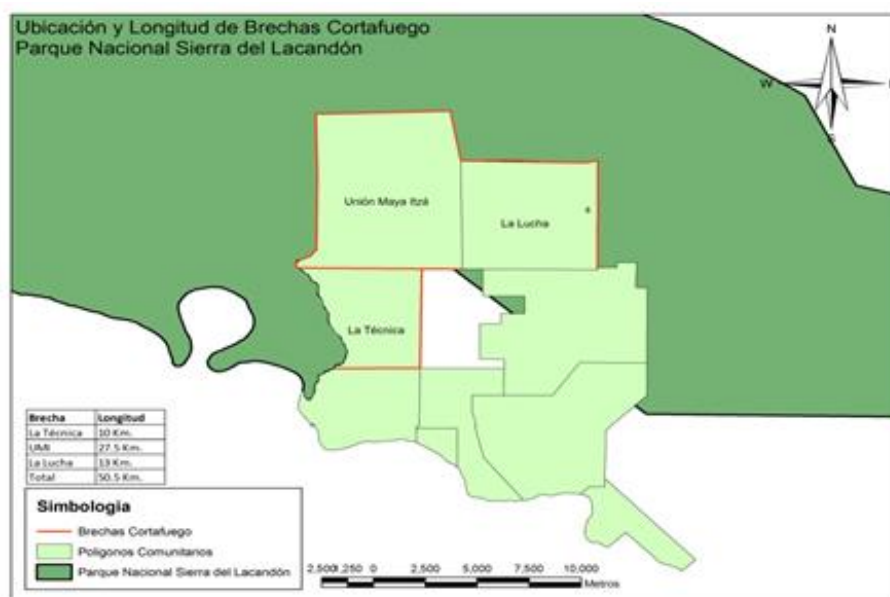


Figure 57 Maintaining of firebreaks

Training workshops for the personnel and professionals of the SLNP

They have participated since 2011 in the Climate Change Conference, as well as in the intermediate negotiations of UNFCCC until 2015. In addition, staff participated in the Congress of National Parks in Australia, Forest Days events, the Global Landscape Forum, and the REDD+ Partnership reunion. In Europe, the primary project proponent took part in meetings with organizations and universities working on REDD+ with field visits to international REDD projects (Figure 58).

Table 33 Participation in congresses /events

Year	Congress/event
2011	REDD+ partnership in Panamá
2012	Forest Day
2013	-
2014	Congress UICN World Park



Figure 58 & Figure 59 Participation in Conference of the Parties in Doha, Qatar and Climate Change Conference in Bonn, Germany.

Farmers trained in Agricultural Production Systems

The indicators “Number of community agricultural plots” and “Number of families with plans for productive family units” are planned for monitoring in 2016. This indicator will be available for the next monitoring period.

As such, the indicators, “Productivity per hectare per household” and “Number of hectares deforested by necessity per home per year” are being considered for the next monitoring period.

Approved Forest and Non-Forest Management Plans

La Lucha cooperative successfully established its Management Plan for areas of forest protection in 2012 (Table 22). Technical advances are being made to the Forest Management Plan for non-timber products for the same cooperative. Unión Maya Itzá cooperative is also advancing in its production of a Forest Management Plan.

Table 34 Number of communities / cooperatives with Management plans

Year	Community	Management plan
2012	La Lucha	Management Plan for Areas of forest protection
2013	-	-
2014	-	-

Forest nurseries and number of species used

Three agroforestry nurseries have been implemented in the SLNP. These nurseries are in the communities of Técnica Agropecuaria, Villa Hermosa and Bethel, where species of economic and biological importance are produced. Most seeds are obtained from the core zone. Plants are distributed to communities for reforestation, forest enrichment or “guamiles,” and implementation of agroforestry systems. The project does not use genetically modified species.

Project activities work with the following native species:

Table 35 Forest species used by the project

Scientific name	Spanish name	English name
<i>Cedrela odorata</i>	Cedro	Spanish Cedar
<i>Swietenia macrophylla</i>	Caoba	Large-leaved Mahogany
<i>Brosimum alicastrum</i>	Ramón	Breadnut
<i>Theobroma cacao</i>	Cacao	Cocoa
<i>Pimenta dioica</i>	Pimienta	Allspice

Micro credits awarded



Fundación Defensores de la Naturaleza and OroVerde with the aid of the financial institution Cooperativa Coopsama R.L. and initial financing from the Otto Eckart Foundation have created a pilot project for microcredits with positive environmental effects in the Sierra del Lacandón National Park. This alliance combines the specific knowledge of the partners in one project with significant positive impact on improving the living standards in the beneficiary communities. The paramount goal of this is to offer the communities financial services with which sustainable alternatives for the development

and the economic growth of the region can be generated in line with the park’s objectives for environmental protection. Examples of these supported activities include financing for shops to sell products for daily use, including baked goods, clothing, or handicrafts.

In the first phase of the program, twenty women and their families benefited from these services. These women have mainly developed commercial ventures (selling of daily products, pharmacies, small taverns) with a 100% rate of return without delays in payments. In August 2012, the second round of the program started, in which thirteen women and men participate (Table 36).

Table 36 List of beneficiaries of micro credit 2012

No.	Name	Amount (Q)	Investment	Community
1	Jose Alfonso Lopez	6,000	Buying and selling basic grains	Villa Hermosa
2	Rosa Olinda Esquite Garcia	6,000	Purchase of poultry	
3	Mirza Portillo Mateo	10,000	Buy telephone recharge cards	
4	Mercedes Granados Cifuentes	5,000	Cut and confection	
5	Marta Amarilis Cheguen	9,000	Store expansion	
6	Mario Raymundo Mendez	5,000	Pinchazo ⁶³	
7	Transito Carrera	10,000	Pharmacy	
8	Edras Donald Portillo Gomez	5,000	Typing and computer center	
9	Dilian Lorena Salguero Gomez	5,000	Food sale	
10	Carlos Xoc Quej	5,000	Store expansion	
11	Alex Alfredo Ramirez Esquite	10,000	Buying and selling basic grains	
12	Alba Concepcion Mendez	10,000	Library expansion	La Lucha
13	Josefa Hernandez	10,000	Store expansion	

This program provided an opportunity for women to participate directly in strengthening family finances and providing financially for family needs. The next stage of the microcredit program has been planned for 2015.

Personnel with permanent contract in the SLNP

The number of people working with permanent contract in the park has increased since 2011, due to community development projects that have been developed and are being implemented (Table 37).

In the baseline (2011), there were nine persons employed full time. By the end of the monitoring period, the project had fourteen people working permanently on park activities (Figure 60).

Table 37 Number of people employed by the project permanently

Year	Number of people employed by the project permanently
2011	9
2012	6
2013	15
2014	14

⁶³ Equipment used in the automotive industry

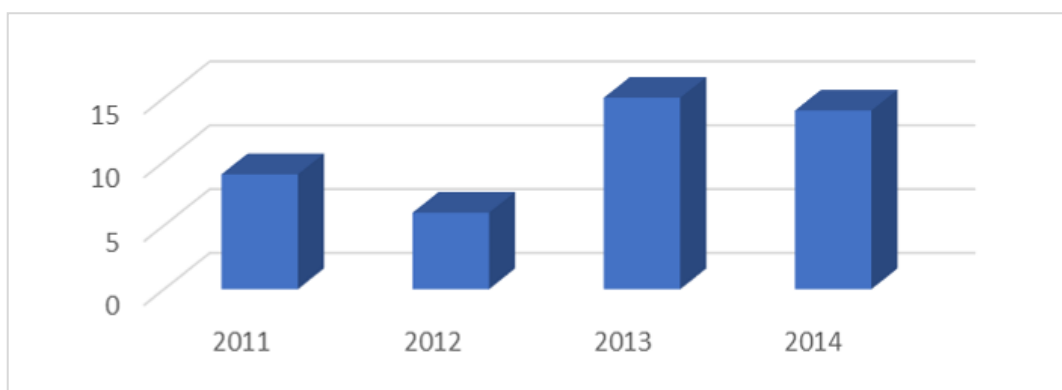


Figure 60 Number of people employed by the project permanently.

Minors participating of the REDD+ project

During the monitoring period, there has been no record of minors working in the REDD+ project. This indicator is planned for implementation in the next monitoring period.

GL2.4 / GL2.5 Direct women beneficiaries

In Arroyo Yaxchilan and La Lucha communities, women are participating in the project and are beneficiaries of forestry incentives.

For the monitoring period, the number of women beneficiaries of forest incentives in Arroyo Yaxchilan has remained constant. In the case of La Lucha, three (3) women were beneficiaries of the project during the years 2011, 2012 and 2014; and in 2013, this value reached five (5) female beneficiaries (Figure 61 & Figure 62).

Table 38 Beneficiaries of forest incentives in Arroyo Yaxchilan.

Beneficiaries of forest incentives Arroyo Yaxchilan			
Year	Men	Women	Total
2011	6	5	11
2012	6	5	11
2013	6	5	11
2014	5	6	11

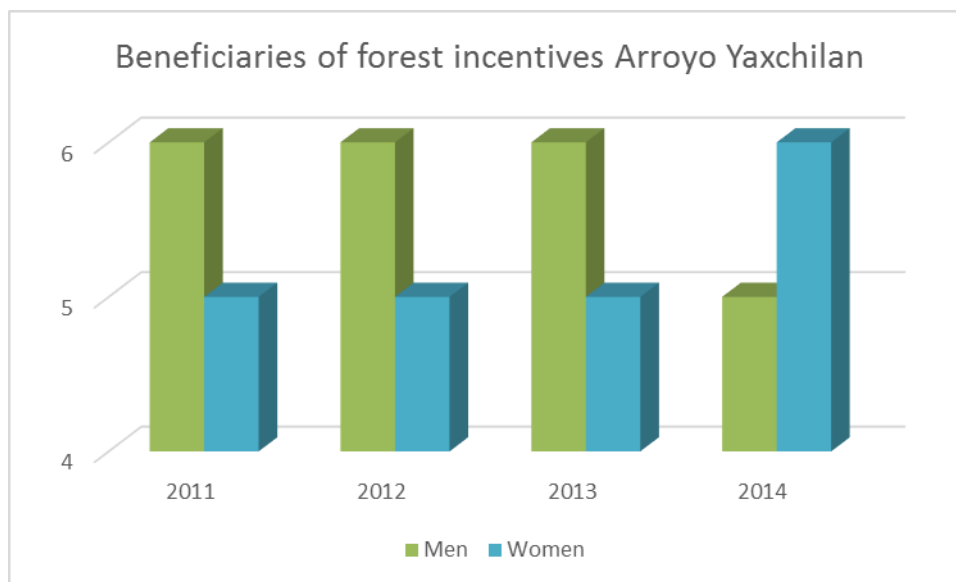


Figure 61 Beneficiaries of forest incentives in Arroyo Yaxchilan.

Table 39 Beneficiaries of forest incentives in La Lucha.

Beneficiaries of forest incentive La Lucha			
Year	Men	Women	Total
2011	15	3	18
2012	15	3	18
2013	13	5	18
2014	15	3	18

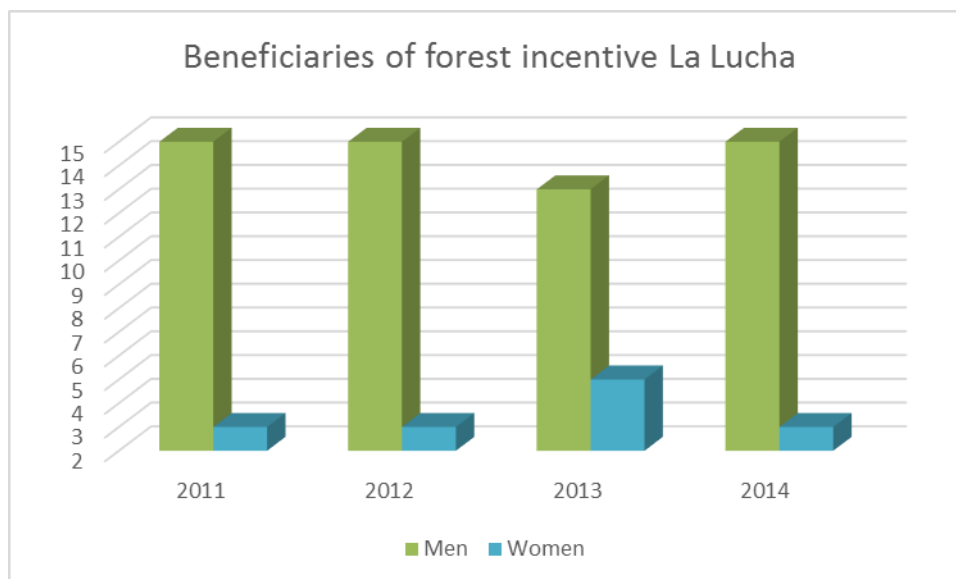


Figure 62 Beneficiaries of forest incentive in La Lucha.

Capacity building and governance in REDD

During the monitoring period, several events were held by FDN to strengthen community capacity and cooperation for the conservation and sustainable management of the SLNP. Both the number of events and community participation have increased during the monitoring period (Table 40). For specific details, please see Annex III.

Table 40 Summary of activities conducted 2011 – 2014.

Description	2011				2012				2013				2014			
	N° events	Women	Men	Total	N° events	Women	Men	Total	N° events	Women	Men	Total	N° events	Women	Men	Total
REDD+ mechanisms and implications for Fundación Defensores de la Naturaleza and Guatemala	6	35	67	102	3	17	45	62	3	19	73	92	4	10	51	61
Meeting technical staff to review project progress	5	22	31	53	13	33	147	180	6	30	62	92	19	78	141	219
Training workshops to Community Development Council (COCODES) and Cooperatives Directive	7	38	141	179	4	1	81	82	15	85	365	450	36	177	494	671
Interinstitutional meetings	6	28	76	104	7	24	85	109	1	6	20	26	7	28	49	77
Total	24	123	315	438	27	75	358	433	25	140	520	660	66	293	735	1028

Non-compliance cases of applicable law by community

This indicator monitors legal cooperatives and communities in the project zone. All areas must comply with national laws in Guatemala and cooperation agreements.

There have been no non-compliance cases for this monitoring period.

Communities that effectively manage to apply measures in case of non-compliance with applicable laws by any of its members

This indicator monitors corrective or mitigation measures employed by the cooperative or community that has a non-compliance in an agreement, law or regulation that influences their area.

Since there is no non-compliance, there are no corrective measures for this monitoring period.

Indirect Impacts Social Indicators

The monitoring for the social indirect impacts will be presented in the next monitoring report. The survey template is described in Annex I Format Social Survey.

7.1.1 High Conservation Value

CM2.2 / GL1.2 In Areas of High Conservation Value with respect to community wellbeing, there have been no negative impacts. In fact, project activities have positively impacted forests, due to the focus on developing training for sustainable forest management, enriching community plots, and maximizing productivity to satisfy the basic needs of the community.

Through health workshops, waste management, and water management, the contamination of water resources has been avoided, protecting watersheds and scenic landscape resources and, in turn, conserving hydrologic functioning.

In addition, cultural management is preserving scenic landscape and archaeological resources in the zone, conserving traditions, local culture, and resources management (Figure 14 & Figure 16).

A survey (Table 41) was performed in the project zone to ensure that no High Conservation Value factors are negatively affected as well as to monitor the perception of communities regarding the use of forests. The effectiveness of this method allows community members to write what they think about the project implementation. Moreover, FDN has an extensive track record regarding the management of community-based projects, conservation projects, and integration of socio-economic activities within protected areas alongside the monitoring of biodiversity and cultural heritage. There is trust and good communication between the technicians of FDN and community members, therefore, there is no doubt as to the veracity of the information provided. Furthermore, the communities sometime include technicians in community meetings and assemblies to serve as witnesses or to contribute their knowledge.

The project activities do not restrict the communities from using the natural resources within PNSL; rather, they guide and empower communities to sustainably use timber and non-timber resources.

Table 41 Monitoring results for HCV5 and HCV6. All surveys available to auditors.

Cooperative	HCV 5			HCV 6
	"Are you or members of your household restricted in sourcing from forest products including commercial goods (timber, xate, etc.), firewood and subsistence hunting?"	"Were you offered alternatives to collecting these products in natural forests"? (For commercial goods, firewood and subsistence hunting separately)	"Are these alternatives attractive to you?" (For commercial goods, firewood and subsistence hunting separately)	"Are you or members of your household restricted in using the forest to fulfil your cultural needs?"
La Lucha	Not at the moment. Everything is for our basic use.	Only the alternative product of Ramon.	I think they are good, but I am not involved in any.	Not for now.
	Not at this time. We can and do use the forest responsibly.	Only the alternative product of Ramon.	I have heard of some alternatives, but I am not involved for now.	No.
	I think that no, for the moment.	I collected Ramon nut.	Very good, because many things can be done for food or other things.	No.
	Not yet. We have harvested wood with logging permits from CONAP.	Only the alternative product of Ramon.	I think it is good. Improves our economy.	Not for now.
La Técnica Agropecuaria	Here in our community everyone has access.	I have heard of some alternatives, but I am not involved for now.	I think it may support families.	No.
	We have mechanisms for the use of natural resources in an orderly manner in forest and agricultural areas.	Not for now, because our forest is in recovery.	Yes, we require more support to implement projects such as ecotourism.	No, because we have our areas well defined to use our resources responsibly.
	Not for now.	I participate in meetings but I am not in any.	They are of great benefit.	Not for now.
UMI	Animal hunting and fishing.	In the ordering of our parcels.	I have no idea of this alternatives.	No, we only use what is necessary.
	Illegal logging and animal hunting.	We get leaves of "guano" for the roof of our house.	Only for our own use, but there are many requirements to commercialize.	No.
	Firewood trade because it is forbidden.	Some guidance, but there is no follow-up.	Yes but I do not know much.	We are free as long as we comply with the established agreements.

Dissemination of information

CM4.3 All results will be publicly available on the Internet, and summaries are communicated to the Communities and Other Stakeholders through appropriate media. Additionally, all documents and information about the results of the monitoring and verification of this project will be published in the platforms of the VCS and CCB standards as usual.

FDN has extensive experience with dissemination of the project to communities. The most effective medium agreed with communities is the dissemination of periodic newsletter reporting the progress of the project in all its phases. The project considers the translation of important documents to Q'eqchi language. The monitoring plan and monitoring result are disclosed through the governance committee and workshops with communities.

For the monitoring period, the January 24, 2016, meeting minutes of the governance committee state awareness of the validation and verification documents and their availability online for consultation (proof of documentation in "Dissemination of Information folder"). Furthermore, the internal regulations of the committee describe the consultation of the project progress within cooperatives and surrounding communities through the representatives of the general assembly, which have been responsible for sharing information about validation and verification of the project.

7.2 Negative Offsite Stakeholder Impacts

CM3.1 / CM3.2 / CM3.3 Between 2012 and 2014, the project has not caused negative impacts during the monitoring period to communities or other stakeholders. Before initiating a project or associated activities, a community meeting is gathered to explain the objectives and methods that are expected to achieve. Finally, the meeting attendants or other stakeholders decide whether or not to participate in the initiative.

7.3 Exceptional Community Benefits

GL2.1 The project area corresponds to the total forest area of Unión Maya Itzá, La Técnica Agropecuaria and La Lucha cooperatives, all with legal land tenure; and the private properties of Fundación Defensores de la Naturaleza, Naranjitos and Centro Campesino areas.

For the 2009 baseline study, households with financial means equal to or less than \$2 USD per person per day were considered to be below the poverty line, and households with financial means equal to or less than \$1 USD per person per day were considered to be below the line of extreme poverty, according to the most-of-t used international standard (International Labour Organization).

In the 2009 baseline study, for the cooperative of La Lucha, it was established that the average was Q 10.88 (Guatemalan Quetzal, GTQ) (\$1.30 USD) available daily per person. At the lowest extreme, there were 2.3% of families subsisting on Q 2.43 (\$0.29 USD) per person per day, while at the highest extreme, there were 2.3% of families living on Q 30 (\$3.60 USD) per person per day.

A total of 20.5% of households fell above the poverty line, while the remaining 79.5% fell below the line. Of those below the poverty line, 53.8% fell into the category of extreme poverty. Agriculture was the main source of income for families living below the poverty line.

In the case of La Técnica Agropecuaria, 60.5% of households subsisted on less than Q 16 (\$2 USD) per person per day. Among those households, 23.3% of the total subsisted on less than Q 8 per person per

day (\$1 USD). At the lowest extreme were families subsisting on Q 1.90 (\$0.23 USD) per person per day, while at the highest extreme were families living on Q 55 (\$6.88 USD) per person per day. The average was Q 14.32 (\$1.79 USD) per person per day.

Finally, for Unión Maya Itzá, 38.3% of households subsisted on less than Q 1,000 per family per month. 29.8% of households had between Q 1,000 and Q 2,000 per month, and 12.8% had between Q 2,000 and 3,000 per month. At the lowest extreme (2.1%) were families subsisting on Q 3.70 per person per day, while at the highest extreme (2.1%) were families living on Q 25 per person per day. The average was Q 10.27 (\$1.23 USD) per person per day.

While 21.1% of households fell above the poverty line, the remaining 78.9% fell below the poverty line. 36.8% of households were considered to be in extreme poverty. Indicators of the well-being impacts from short-term and long-term activities were incorporated into the community impact monitoring plan's Basic Necessity Survey and Participatory Rural Assessment. The results of the survey of the poverty rate variation will be presented in the following monitoring report.

The project is managed through the "Governance Committee of the Project" that meets periodically and in which each entity has a representative with voting rights. The Governance Committee will be responsible for the design and implementation of project activities, monitoring and general management of the project on site. The cooperatives will participate in the decision making through representation in the Governance committee and collaborate in the implementation of project activities in joint with FDN.

GL2.2 The development of the project has been realized with the participation of all communities (See Stakeholder consultation folder). In addition, community monitoring plan has included indicators for assess the short-term and long-term net positive well-being benefits for the cooperatives (Please refer to Monitoring Plan, PDD Section 6 and Monitoring Report Section 7). Finally, the project has developed a survey for the social indirect impacts that will be presented in the next monitoring report (ANNEX I).

Unión Maya Itza, La Lucha and La Técnica Agropecuaria Cooperatives, private properties within the park, and Pozo Azul, Villa Hermosa, and San Juan Villanueva communities that currently have cooperation agreements with CONAP defined activities focused on conservation, recovery and sustainable use of natural resources.

They have established agroforestry systems with species such as Ramon and Allspice, and have developed the necessary legal instruments to plan the sustainable management of non-timber forest resources. In addition, they will also invest in the purchase of equipment and training for the post-harvest management of Ramon seed. This will not only benefit families economically but also ensures the protection of forests present in these areas.

GL2.3 / GL2.7 All negative impacts were explained in the participatory consultation process with communities (Refer to Stakeholder consultation folder), among those listed:

- Decreased revenues from illegal activities
- Higher control over the expansion of the agricultural frontier
- People may believe that they can only live from the project.
- Mishandling of the project can generate pollution.
- The project promotes individualism.

All the REDD+ project activities are designed to ensure that vulnerability is reduced and benefits increase for the most marginalized and vulnerable groups through strengthening land tenure, developing alternative economic activities to reduce financial vulnerability, protecting natural resources to reduce environmental vulnerability, and increasing governance capacity enhances the relationship and contact with other institutions, which reduces the vulnerability of the community (Refer to Section 7.1 for Net Positive Community Impacts results). Community participation was taken into account in the development of the PDD. Furthermore, the project has developed mitigation measures for the project activities (Refer to PDD Section 2.3 and Section 2.7).

GL2.4 The community groups were identified due to their level of organization and direct participation with the communities involved in the project.

Women's Committee on Ramon (*Brosimum alicastrum*): Seed collection to provide economic opportunities for the benefit of women. The committee is composed of the participants in the Ramon value chain – the women – and is charged with the organization of said activity on behalf of the Cooperative.

ACOFOP (Asociación de Comunidades Forestales de Petén): This is a community-based association consisting of twenty-three rural and indigenous organizations. The association facilitates community forestry, guaranteeing that natural forests will be maintained in perpetuity in the Multiple Use Zone of the Maya Biosphere Reserve.

The main objective of ACOFOP is to improve the quality of life of forest communities through community forest management and by promoting social, ecological, economic and political sustainability in the Multiple Use Zone.

Pastoral Social of Petén: This is a religious organization that functions through the continuous and public action of the Catholic Church. The organization has knowledge and experience of the social and economic realities of life in these local populations, and it uses this perspective to define the most appropriate forms of intervention to transform and improve their situations. Actions are organized with communities through the parishes and various committees, which work directly with beneficiaries in order to respond to a diverse set of needs.

The Pastoral Social of Petén organizes six committees, which focus on the following topics: Human Rights, Human Migration (Refugees and Displaced Persons), Commission for Women, Commission for Health, Commission for Education, and the Coordination Commission.

Forest Monitoring Committee for Cooperative: The Monitoring Committee is the body responsible for the control and supervision of each Cooperative. This authority is responsible for examining the operations of the cooperative and verifying the sustainable use of natural resources, taking into account the approved management plans.

Young Promoters of Sexual and Reproductive Health: Young Promoters provides educational talks and half-day workshops in schools throughout the communities of Nueva Jerusalem, Guayacán, Manantialito, Pozo Azul, Villa Hermosa, San Juan Villa Nueva, La Técnica, Retalteco, La Lucha and Unión Maya Itza. An additional training is held for two consecutive days so that young people can gain a dynamic understanding of sexual and reproductive health. This training emphasizes and develops the capacity of youths to critically assess and reflect on the lifelong impacts and consequences of sexual decisions taken at an early age. Young people are trained to strengthen their confidence and self-esteem, with the aim of empowering participants to become leaders and create mini knowledge-transfer networks to inform other youths in their communities.

Community Tourism in La Técnica Agropecuaria Cooperative: Organized group composed by local young people. The main objective is to provide ecotourism services to Sierra de Lacandón National Park, including the archaeological site of Piedras Negras, Usimacinta River and the cooperative itself. This group is supported by ACOFOP and FDN.

GL2.4 Community groups that are marginalized and/or vulnerable were identified according the land tenure. These communities are Nueva Jerusalén II, Guayacán, El Pital, El Esfuerzo y Nuevo Paraíso 107. The communities are also located within the SLNP and were as well established prior to the establishment of the protected area law. The importance and priority to work with these communities is the proximity to the core zone of the SLNP and the pressure on forest areas. In addition, if they do not adjust their permanence in the park, they will not be able to benefit from future projects from FDN, CONAP, Municipalities, Guatemala's State and project activities.

For these reason, adjustment of land uses and land use rights and the signing of cooperation agreements is priority in order to reduce the high sensitivity and low adaptive capacity to adjust in response to actual or expected changes. The implementation of the project's strategies will reduce the effect of climate change and help the communities to adapt and to improve their quality of life. Therefore, the project activities will generate net positive impacts on the well-being of these communities.

There are no risks nor barriers identified. CONAP and FDN work currently on obtaining signed cooperation agreements for these communities to legitimize their situation according to the legal jurisdiction that is applicable in the areas of the SLNP. CONAP has already expressed the willingness to maintain the settlements with historic land rights if they follow the guidelines considered by the applicable law.

Periodic local consultations are held to prevent vulnerable community members from being negatively affected by the project. The Basic Necessity Survey will be used to identify the most marginalized families and to monitor whether such families are receiving net positive impacts. Ultimately, the project is designed and shall be implemented to generate net positive impacts for all families living throughout the Project Zone.

Project activities are design to generate net positive impacts on the well-being of all identified community groups (Refer to PDD and Monitoring Report Section 2.2). No negative impact have been identified for community groups.

GL2.5 The project is generating net positive impacts on the welfare of women and ensuring that women participate in decision-making. Currently, there is a pilot project which primary purpose is to provide financial services to the communities of influence of the Sierra del Lacandón; so that they create opportunities for development and economic growth of the area, through sustainable and aligned with the goals of environmental conservation alternatives. The first phase of the program has achieved a total of sixteen beneficiary families, with women as leaders, who have done business activities (commodity shops, pharmacy, dining, bakery products, crafts and others), with a return rate of 100% and no late payments. In August 2012, the second phase of the program began with thirteen beneficiary families included as credit-management-responsible men and women (list of beneficiaries in Table 36). This program provides an opportunity for women to participate directly in strengthening family finances and provide funds for family needs.

Furthermore, the Women's Committee on Ramon (Community group) is in charge of the organization on behalf of the Cooperative, defining the decision-making process and the distribution mechanism for benefit sharing.

GL2.6 The design and implementation of benefits sharing mechanism is under development. The governance committee, which involved all project proponents, agrees that the distribution of benefits should provide effective incentives for REDD+ actions and create incentives to change behavior of forest deforestation and degradation (meeting minutes available for auditor).

The committee has agreed that the Benefits Distribution Mechanism is through a structured program and FDN will present the first proposal document taking into consideration the suggestions of the project partners.

GL2.7 The governance committee meets periodically to evaluate the process and progress of the project and the validation and verification phase. The community representative participating in the governance committee are the responsible to share all information and to involve the community in the decisions. According to the minutes of meeting (available for auditor) all community representative are aware and have knowledge about the current situation of the REDD+ project and potential benefits in monetary terms.

GL2.8 It is important to note that, for the first time, members of the cooperatives have management rights, acting as both private owners and project partners. They are represented in the Committee of Governance of the project (see Project committee folder), which is composed of a principal representative and an alternative from each cooperative, as well as a representative from Fundación Defensores de la Naturaleza. The committee allows for those involved to have full and effective participation in decision making and project implementation, including decisions as to the distribution of benefits generated by the project. The committee will function for the entire duration of the project.

The project activities contribute to the ability of involved individuals and families to realize the sustainable management of natural resources, increase incomes, and improve the quality of life. The benefits resulting from the project will help improve the poverty index of the cooperatives of La Lucha, La Técnica Agropecuaria and Unión Maya Itzá.

GL2.9 The Project Proponents are directly engaging the local community to develop local capacity in the design, implementation and ongoing management of the project. It is important to note that the project will work to build local capacity within all families, including women and marginalized families.

For example, in the Women's Committee on Ramon, women have played an important role in the sustainable use of this resource. They are the ones that go to the forest at harvest time to collect the seed and sell it in the center of the community of La Lucha. This has generated jobs and income for the population. In the case of the Community Tourism Group in La Técnica Agropecuaria Cooperative, women organize and provide tourist services with the support of ACOFOP. Among the project's achievements are training women in cooking and handling of food and beverages, training community guides, experiential tourism and new local jobs (boat services).



Figure 63 Community Tourism in La Técnica Agropecuaria.

Finally, local capacity is developed through workshops. In the monitoring period, fourteen (14) workshops have been developed on environmental education and sustainable production, and twenty (20) workshops on forest fires management were developed in San Juan Villa Nueva, Poza Azul, Pital, Villa Hermosa, Settlement La Revancha, UMI, La Lucha, Nueva Jerusalem II, and Military detachment. There were thirty-one (31) lectures on family planning. Twenty (20) women have benefitted from the microcredit program in 2011 – 2012 (first phase), and thirteen became beneficiaries in 2012 during the second phase (seven women and six men – second phase). Eleven community members have been trained as agroforestry promoters and will help to empower their communities.

8 BIODIVERSITY

B1.1 The SLNP is composed of a wide variety of ecosystems due to its geomorphological features. The unique biodiversity of its flora and fauna helps to sustain a series of ecosystem services and ecological processes and functions that preserve the integrity of the protected area.

There are nine terrestrial and two aquatic ecosystems in the park, according to the National Institute of Forestry (*Instituto Nacional de Bosques*, or INAB). Nearly one-hundred percent of the national park is lowland tropical rainforest and ninety percent is composed of riverine ecosystems, primarily the mighty Usumacinta River. It is part of the core zones of the Mayan Biosphere Reserve. For this reason, it ranks as one of the most diverse in the country. For more information, refer to PDD Section 1.3.

B1.3 Without the project activities, the SLNP faces various threats:

a. Elements of natural and cultural preservation:

- Forest fires: fires are associated with the economic and social dynamics of human settlements in and around the SLNP, including areas in the Mexican territory. Agricultural activities (subsistence agriculture and livestock) are the main cause of forest fires in the area where slash and burn techniques are used (in an uncontrolled manner) to prepare land for the planting of crops or pasture and even for future encroachments,
- Land use change: Human migration, slash and burn agriculture, and subsequent change to pasture for cattle production are the greatest impacts on the natural landscape.

b. Natural elements:

- Removal of wildlife: fishing, poaching (causing change in the forest structure due to the animals play a vital role in pollination, seed dispersal and germination) and removal of live animals (used as pet).
- Discharge of pollutants: direct threat to water sources, especially the physico-chemical and microbiological quality of water due to the presence of chemicals used in cattle production and crops, soap and detergent, the presence of hydrocarbons, oils and grease used in the operation of marine engines, and an increase in the number of colonies of *E. coli* and fecal and total coliforms.
- Extraction of timber and non-timber forest products: overuse of valuable species (selective logging) such as *Swietenia macrophylla*, *Cedrela odorata*, *Astronium graveolens* and *Chamaedorea oblonga*.
- Erosion: linked to sedimentation and the dragging of nutrients and pollutants to water sources.
- Introduction of exotic species: they are introduced as productive alternatives, but tend to occupy an ecological niche of some native species especially in water sources.

8.1 Net Positive Biodiversity Impacts

B2.1 The project does not anticipate any direct or indirect negative impacts on biodiversity, as all of the interventions have been designed to promote improved environmental management by avoiding deforestation and degradation and fostering the regeneration of already degraded forests.

To evaluate biodiversity, primary project proponent use the Camera Trap Method. The method selected is Bushnell Trophy Cam which is designed for extreme environments of moisture and high temperatures; as well as snow and water resistant. The Trophy Cam is a digital camera designed to be activated by a high sensitivity motion sensor, which uses a passive infrared motion sensor.

This tool is use for studies of ecology and wildlife. The areas where this method has been most widely used are:

1. Study of the distribution and range of species where researchers seek to understand the factors that determine the presence of a species in a given location.
2. Metapopulation dynamics where the occupation of the site or patch is related to the specific characteristics of the site. Ultimately, the chances of colonization can be modeled with respect to the characteristics of the patch.

Monitoring patch occupancy may reveal changes in the status of a species over large areas, so it is appropriate for populations of species that exhibit wide fluctuations in short periods of time. Forest conservation will increase

The main wildlife monitored by camera traps are jaguar (*Panthera onca*), tapir (*Tapirus bairdii*) and white-lipped peccary (*Tayassu pecari*); due to the state of ecosystems are known through the presence of these species and are under constant threat and listed on IUCN Red List. These species are closely associated with native and primary forest. Conservation strategies are developed to protect the forest and threatened species. Further, forest fires and forest cover monitoring are performed by CEMEC through the analysis of satellite images.

B2.1 / B2.2 FDN has a monitoring team, which is in charge for the biodiversity monitoring using appropriate methodologies for evaluating natural resources. Net impacts are described in Table 42.

Table 42 Biodiversity impacts

Livelihood Asset			
Natural Capital	Tools and Technology	14 workshops on environmental education and sustainable production.	Workshops in the in the communities: Poza Azul, Pital, Villa Hermosa, Settlement La revancha, Nueva Jerusalén, San Juan Villa Nueva; and La Lucha y UMI cooperatives.
	Access to land use	50% of the sampled communities were the legal inhabitants of the land on which they lived. The legal status of Manantialito, El Pital, and Arroyo Yaxchilán has advanced significantly upon the signing of permanent residence agreements in 2015.	Signature and enforcement of cooperation agreements.
		Communities that have defined land boundaries are La Técnica Agropecuaria, La Lucha, Unión Maya Itzá, Manantialito, Pozo Azul, San Juan Villa Nueva, Villa Hermosa, Las Victorias, Guayacán, Retalteco, Nueva Jerusalén II.	Community organization workshops were conducted to strengthen the capacities of the population in decision-making and leadership as well as provide information and guidance on signing cooperation agreements and / or the monitoring of signed agreements.
	Biodiversity	768 patrols conducted.	Maintain interinstitutional presence and detect deforestation or illegal acts that may occur in the protected area.
	Desertification	Maintenance of communities' firebreaks with an extension of 50.5 km and 20 workshops on	Maintenance of firebreaks is conducted once per year in

Livelihood Asset			
		forest fires management in San Juan Villa Nueva, Poza Azul, Pital, Villa Hermosa, Settlement La Revancha, UMI, La Lucha, Nueva Jerusalem II, and the Military detachment.	the fire season, between February and May.
		Three agroforestry nurseries in SLNP.	Nurseries are in the communities of Técnica Agropecuaria, Villa Hermosa and Bethel, where species of economic and biological importance are produced.
	Wildlife	The records of threatened wildlife show the presence of 39 jaguars, 114 tapirs, and 123 peccaries. These values are higher than recorded in the baseline.	These species are indicators of forest status in the SLNP. In addition, through the use of camera trap sampling method, it has been possible to identify other species in the project area
		23 people were captured conducting some type of illegal activity.	FDN manages to stop illegal activities related to hunting, extraction of non-timber and timber products
	Water resources	29% of communities have water infrastructure.	A community's water source is a measure of the level of development of the community and the family economy, and it has a large impact on a family's health and wellbeing.

Illegal settlements in the Project Zone and Leakage Belt

Regarding illegal settlement, three (3) illegal usurpations occurred in 2007, accounting for a total area of 4,950 hectares:

Table 43 Area affected by illegal human settlement.

Illegal human settlement	Area (ha)
San Francisco	563
Pollo Solo	67
Centro Campesino	4320
Total	4950

Concerning the measures adopted, in 2014, FDN assisted in the voluntary departure of the illegal settlement Centro Campesino (Figure 64) in coordination with the relevant government agencies. People are currently scattered in different communities and urban centers in the region depending on their preference. The 4,320 ha illegally occupied were recovered and are in the process of forest regeneration (Table 43). In the case of San Francisco, there is an eviction order pending execution, and several complaints were made in relation to Pollo Solo.

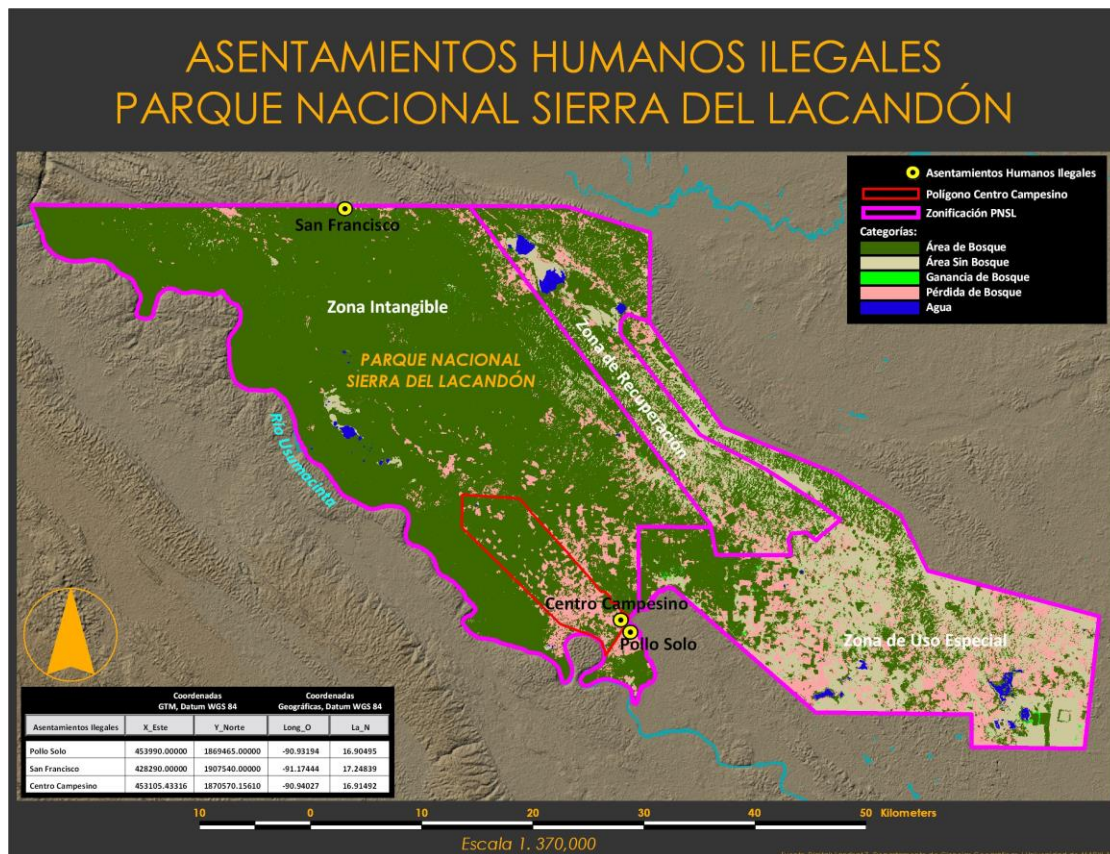


Figure 64 Illegal settlements in the project zone.

Forest conservation in community boundaries

Between 2012 – 2014, a total of 448 hectares of forest in community boundaries were conserved through forest incentives (Table 44). These areas correspond to La Lucha cooperative with 103 ha and La Técnica Agropecuaria cooperative with 345 ha.

Table 44 Number of hectares with forest conservation in community boundaries through forest incentives.

Year	Community	Area (ha)
2011	La Lucha	103
	UMI	0
	La Técnica Agropecuaria (Arroyo Yachilan)	345
	Total	448
2012	La Lucha	103
	UMI	0
	La Técnica Agropecuaria (Arroyo Yachilan)	345
	Total	448
2013	La Lucha	103
	UMI	0
	La Técnica Agropecuaria (Arroyo Yachilan)	345
	Total	448
2014	La Lucha	103
	UMI	0
	La Técnica Agropecuaria (Arroyo Yachilan)	345
	Total	448

In addition, in La Técnica Agropecuaria, FDN is supporting the diagnosis of the productive capacity of their forests. On the other hand, the number of hectares that remain reforested in community boundaries corresponds to a total of 45 has implemented in Arroyo Yachilan. The population of Arroyo Yachilan live in the areas of La Técnica Agropecuaria since 2004 due to the agreements signed in previous years (Table 45).

Also in Nueva Jerusalén II, fifteen hectares of reforestation were established before 2012 (Figure 65). These have been maintained over the years 2012-2014.

Table 45 Number of hectares with reforestation maintained in community boundaries

Year	Community	Área (ha)
2012	La Lucha	0
	UMI	0
	La Técnica Agropecuaria (Arroyo Yachilan)	30
	Nueva Jerusalén II	15
	Total	45
2013	La Lucha	0
	UMI	0
	La Técnica Agropecuaria (Arroyo Yachilan)	30
	Nueva Jerusalén II	15
	Total	45
2014	La Lucha	0
	UMI	0
	La Técnica Agropecuaria (Arroyo Yachilan)	30
	Nueva Jerusalén II	15
	Total	45

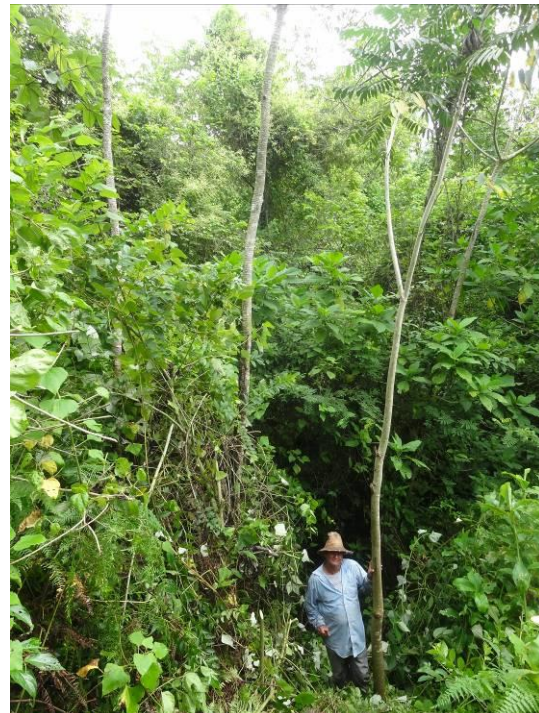


Figure 65 (L) & Figure 66 (R) Reforestation activities in Nueva Jersusalén II (1)

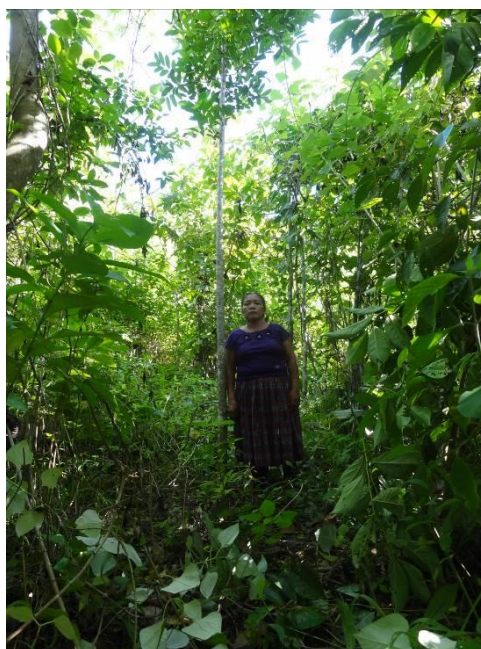


Figure 67 Reforestation activities in Nueva Jersusalén II (2)

On the other hand, FDN continued the forest enrichment activities. In 2012, there was a total of 123 ha of forest enrichment. By 2013, increased in 10 ha and for 2014 there were a total of 136 ha (Table 46).

Table 46 Number of hectares with forest enrichment

Year	Community	Area (ha)
2012	La Lucha	115
	UMI	0
	La Técnica Agropecuaria	0
	Villa Hermosa	3
	Poza Azul	5
	Total	123
2013	La Lucha	125
	UMI	0
	La Técnica Agropecuaria	0
	Villa Hermosa	3
	Poza Azul	5
	Total	133
2014	La Lucha	125
	UMI	0
	La Técnica Agropecuaria	3
	Villa Hermosa	3
	Poza Azul	5
	Total	136



Figure 68 (L) & Figure 69 (R) Agroforestry systems with annual crops and native species in Villa Hermosa (1)



Figure 70 Agroforestry systems with annual crops and native species in Villa Hermosa (2)

Agroforestry systems were also established in several areas. By 2012 it was possible to implement 7 ha in Villa Hermosa and 13 ha in San Juan Villa Nueva; while in 2013 was implemented 13 ha in La Lucha. By 2014, the project implemented a cumulative total of 33 ha with agroforestry systems for the monitoring period (Table 47).

Table 47 Number of hectares with agroforestry system established

Year	Community	Área (ha)
2012	La Lucha	-
	UMI	-
	La Técnica Agropecuaria	-
	Villa Hermosa	7
	San Juan Villa Nueva	13
	Total	20
2013	La Lucha	13
	UMI	-
	La Técnica Agropecuaria	-
	Villa Hermosa	7
	San Juan Villa Nueva	13
	Total	33
2014	La Lucha	13
	UMI	-
	La Técnica Agropecuaria	-
	Villa Hermosa	7
	San Juan Villa Nueva	13
	Total	33

Number of hectares affected by forest fires

The number of hectares affected by forest fires in Peten for the period 2008 - 2013 (Table 48) amounts to a total of 44 606.5 ha. The main cause of forest fires in 2012 (Table 49) and 2013 (Table 50) are intentioned, followed by agricultural burning.

Table 48 Hectares affected by forest fires

Year	Surface affected by forest fires ⁶⁴ (ha)
2008	17231.1
2009	9611.3
2010	2818.57
2011	12126.72
2012	2002.32
2013	816.49

⁶⁴ Forest fires: A fire that occurs in natural or artificial forests produced by human action or caused by nature and progresses without control, causing ecological, climatic, economic and social damages.

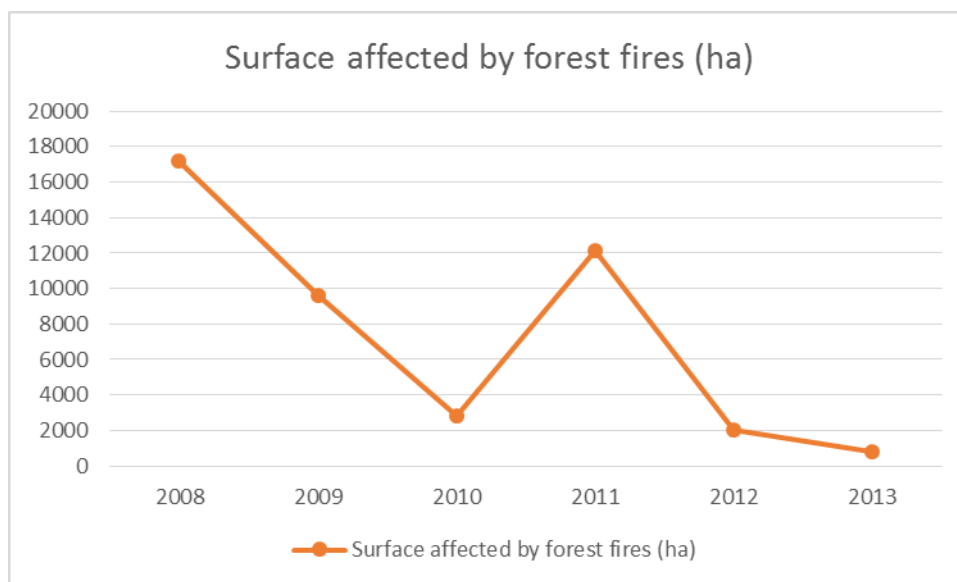


Figure 71 Surface affected by forest fires in Petén

Table 49 Causes of forest fires in 2012

Percentage distribution of the causes of forest fires 2012	
Causes	Percentage (%)
Coalfish	1,9
Hunters	0,9
Campfires	0
Intentioned	63,9
Other causes	0,9
Agricultural burning	21,3
Waste burning	0,9
Pastures burning	10,2

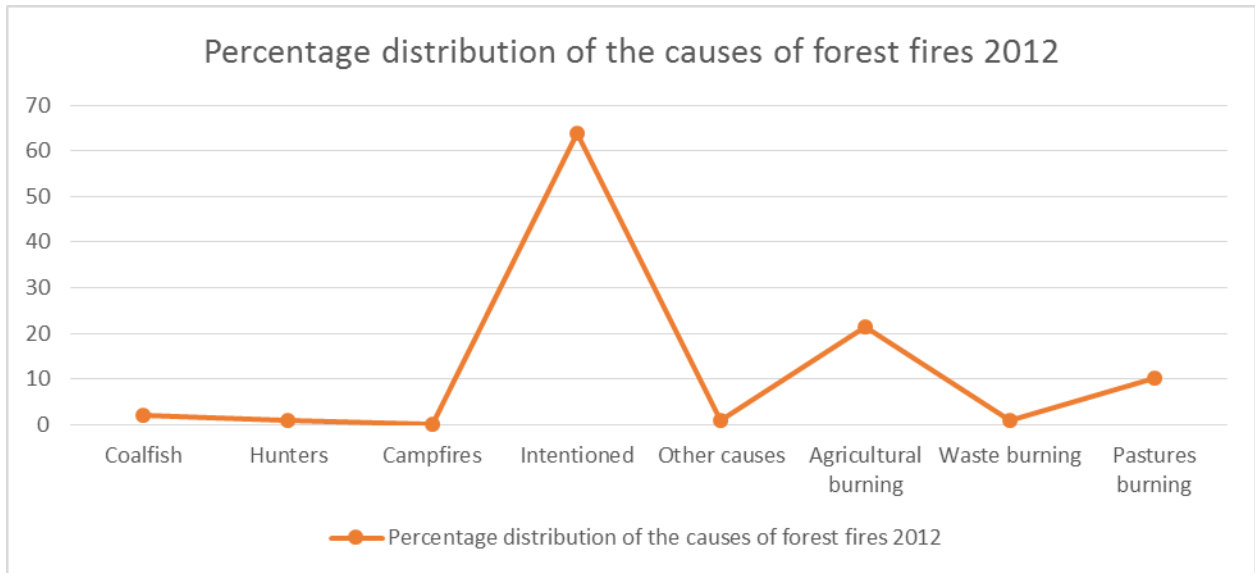


Figure 72 Causes of forest fires in 2012

Table 50 Causes of forest fires in 2013

Percentage distribution of the causes of forest fires 2013	
Causes	Percentage (%)
Coalfish	0
Hunters	0
Campfires	0
Intentioned	73,9
Other causes	0
Agricultural burning	21,7
Waste burning	4,3
Pastures burning	0

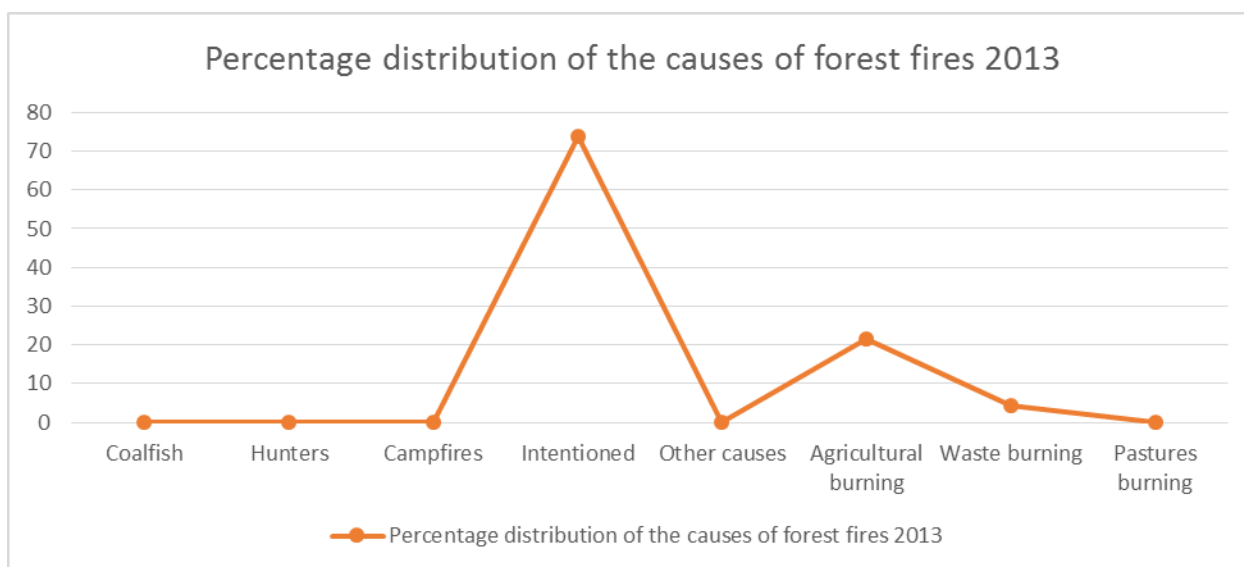


Figure 73 Causes of forest fires in 2013

The next table shows hot spot monitored by CONAP and Wild Conservation Society (WCS) in the Maya Biosphere Reserve (the SLNP are highlighted in orange):

Table 51 Hot spot by season in 2008 – 2014 by Management unit in the MBR

Code	Management unit	2010	2011	2012	2013	2014
ZAM01	Zona de Amortiguamiento	742	887	649	1098	399
ZNE01	Biotopo Cerro Cahuí	0	0	0	0	0
ZNE02	Biotopo Naachtún - Dos Lagunas	0	0	0	0	0
ZNE03	Biotopo San Miguel la Palotada - El Zotz	3	7	1	4	0
ZNE04	Monumento Cultural El Pilar	0	0	0	0	0
ZNE05	Parque Nacional Mirador - Río Azul	0	0	0	1	0
ZNE06	Parque Nacional Tikal	0	1	0	0	0
ZNE07	Parque Nacional Yaxhá Nakúm Naranjo	4	10	2	6	1
ZNE08	Reserva Municipal Bioitzá	0	1	1	0	1
ZNW01	Biotopo Laguna del Tigre - Río Escondido	178	102	105	121	79
ZNW02	Parque Nacional Laguna del Tigre	747	473	381	788	306
ZNW03	Parque Nacional Sierra del Lacandón	182	299	215	454	151
ZUMC01	Concesión Comunitaria Carmelita	1	3	0	3	0
ZUMC02	Concesión Comunitaria Chosquitán	0	0	0	0	0
ZUMC03	Concesión Comunitaria Cruce a la Colorada	9	24	1	18	13
ZUMC04	Concesión Comunitaria La Colorada	3	9	1	7	3
ZUMC05	Concesión Comunitaria La Pasadita	28	50	32	44	15
ZUMC06	Concesión Comunitaria La Unión	0	0	0	0	0
ZUMC07	Concesión Comunitaria Las Ventanas	0	0	0	0	0
ZUMC08	Concesión Comunitaria Río Chanchich	0	0	0	0	0
ZUMC09	Concesión Comunitaria San Andrés I	0	0	0	3	0

Code	Management unit	2010	2011	2012	2013	2014
ZUMC10	Concesión Comunitaria San Miguel	4	35	3	6	5
ZUMC11	Concesión Comunitaria Uaxactún	6	6	8	3	7
ZUMC12	Concesión Comunitaria Yaloch	0	2	1	1	0
ZUMC13	Concesión Industrial La Gloria	0	0	0	0	0
ZUMC14	Concesión Industrial Paxbán	1	2	2	1	2
ZUMNC01	El Lechugal	0	0	0	0	0
ZUMNC02	Corredor Biológico Laguna del Tigre - Sierra del Lacandón	13	20	28	21	7
ZUMNC03	Corredor Biológico Mirador Río Azul - Laguna del Tigre	0	1	0	1	0
ZUMNC04	Corredor Biológico Mirador Río Azul - Tikal Yaxha	0	0	0	0	0
ZUMNC05	Polígono Comunitario Cruce Dos Aguadas	23	78	38	51	36
ZUMNC06	Polígono Comunitario Santa Rosita	32	29	27	29	5
ZUMNC08	Zona de Uso Especial Ruta a Melchor de Mencos	84	105	57	127	28
ZUMNC09	Zona de Uso Especial San Miguel la Palotada - Tikal	0	0	2	1	0
ZUMNC10	Zona de Uso Especial PNLT Norte	75	75	67	103	39
ZUMNC11	Zona de Uso Especial PNLT Oeste	10	14	19	22	21
ZUMNC12	Zona de Uso Múltiple ZUM Sur Central	0	0	0	0	0
TOTAL		2145	2233	1640	2913	1118

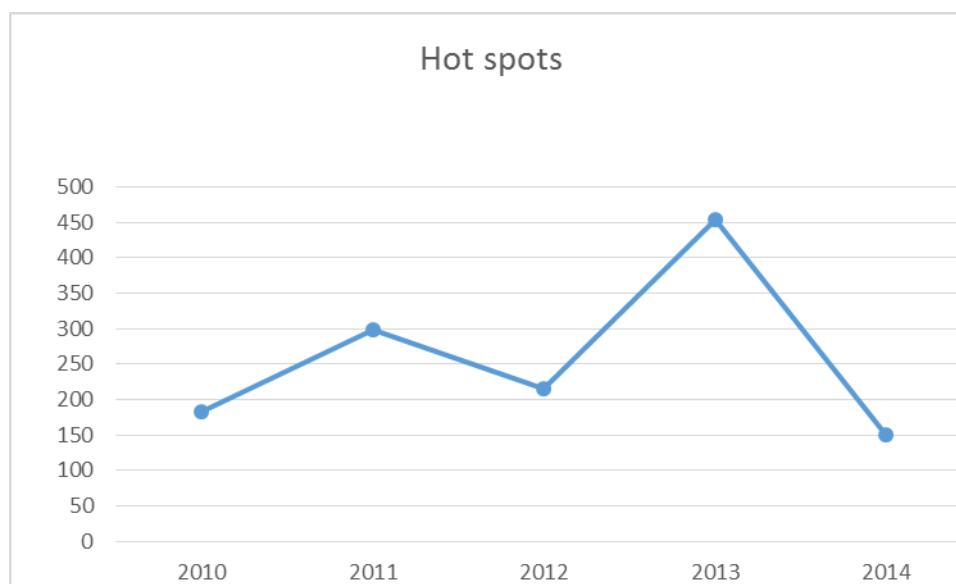


Figure 74 Hot spots in the SLNP

The record frequency of hot spots in the SLNP do not follow a trend. By 2013, 454 hot spots were monitored. While in 2014, 151 hot spots were monitored, corresponding to the lowest data for the period (Table 52). The year with the highest fire scars is 2013, influencing the forest and wetlands / savannas ecosystems (the SLNP are highlighted in orange):

Table 52 Estimated forest and wetlands / savannas fire scar areas

Code	Management Unit	2011		2012		2013		2014	
		For (ha)	Wet/Sav (ha)	For (ha)	Wet/Sav (ha)	For (ha)	Wet/Sav (ha)	For (ha)	Wet/Sav (ha)
ZAM01	Zona de Amortiguamiento	4855	917	4971	1218	6214	4035	370	321
ZNE01	Biotopo Cerro Cahuí	0	0	0	0	0	0	0	0
ZNE02	Biotopo Naachtún - Dos Lagunas	0	0	1	0	0	0	0	0
ZNE03	Biotopo San Miguel la Palotada - El Zotz	262	0	16	2	17	0	1	0
ZNE04	Monumento Cultural El Pilar	0	0	0	0	0	0	0	0
ZNE05	Parque Nacional Mirador - Río Azul	0	0	15	0	0	0	0	0
ZNE06	Parque Nacional Tikal	0	0	1	1	0	0	0	0
ZNE07	Parque Nacional Yaxhá Nakúm Naranjo	0	3	4	0	21	32	0	6
ZNE08	Reserva Municipal Bioitza	20	0	8	0	0	0	0	0
ZNW01	Biotopo Laguna del Tigre - Río Escondido	1999	1305	2465	1587	1559	2381	225	670
ZNW02	Parque Nacional Laguna del Tigre	10159	14302	5059	8494	9465	18064	838	3396
ZNW03	Parque Nacional Sierra del Lacandón	3294	782	3225	753	7221	1261	154	394
ZUMC01	Concesión Comunitaria Carmelita	20	0	12	2	18	10	0	0
ZUMC02	Concesión Comunitaria Chosquitán	0	0	0	0	0	0	0	0
ZUMC03	Concesión Comunitaria Cruce a la Colorada	79	6	41	6	38	2	9	3
ZUMC04	Concesión Comunitaria La Colorada	2	0	5	0	9	1	1	0
ZUMC05	Concesión Comunitaria La Pasadita	471	7	182	1	88	1	6	1
ZUMC06	Concesión Comunitaria La Unión	0	0	0	0	0	0	0	0
ZUMC07	Concesión	0	0	0	0	0	0	0	0

Code	Management Unit	2011		2012		2013		2014	
		For (ha)	Wet/Sav (ha)	For (ha)	Wet/Sav (ha)	For (ha)	Wet/Sav (ha)	For (ha)	Wet/Sav (ha)
	Comunitaria Las Ventanas								
ZUMC08	Concesión Comunitaria Río Chanchich	0	0	0	0	0	0	0	0
ZUMC09	Concesión Comunitaria San Andrés I	0	0	0	0	0	0	0	0
ZUMC10	Concesión Comunitaria San Miguel	256	0	46	0	37	0	0	0
ZUMC11	Concesión Comunitaria Uaxactún	7	0	40	4	11	0	0	0
ZUMC12	Concesión Comunitaria Yaloch	0	0	0	0	192	0	0	0
ZUMC13	Concesión Industrial La Gloria	0	0	0	0	0	0	0	0
ZUMC14	Concesión Industrial Paxbán	14	0	24	1	8	1	0	0
ZUMNC 01	El Lechugal	0	0	0	0	0	0	0	0
ZUMNC 02	Corredor Biológico Laguna del Tigre - Sierra del Lacandón	126	17	104	19	73	89	2	0
ZUMNC 03	Corredor Biológico Mirador Río Azul - Laguna del Tigre	0	0	0	0	536	20	0	0
ZUMNC 04	Corredor Biológico Mirador Río Azul - Tikal Yaxha	0	0	18	0	0	0	0	0
ZUMNC 05	Polígono Comunitario Cruce Dos Aguadas	909	24	182	1	271	20	14	1
ZUMNC 06	Polígono Comunitario Santa Rosita	96	132	196	18	166	346	4	47
ZUMNC 08	Zona de Uso Especial Ruta a Melchor de Mencos	120	3	141	0	473	3	1	23
ZUMNC 09	Zona de Uso Especial San Miguel la Palotada - Tikal	5	0	5	0	3	0	0	0
ZUMNC 10	Zona de Uso Especial PNLT Norte	615	3312	840	5754	1581	6004	102	2318
ZUMNC 11	Zona de Uso Especial PNLT Oeste	299	25	125	30	139	79	21	27
ZUMNC 12	Zona de Uso Múltiple ZUM Sur Central	0	0	1	0	1	0	0	0
	TOTAL	23608	20834	17726	17891	28141	32348	1750	7207

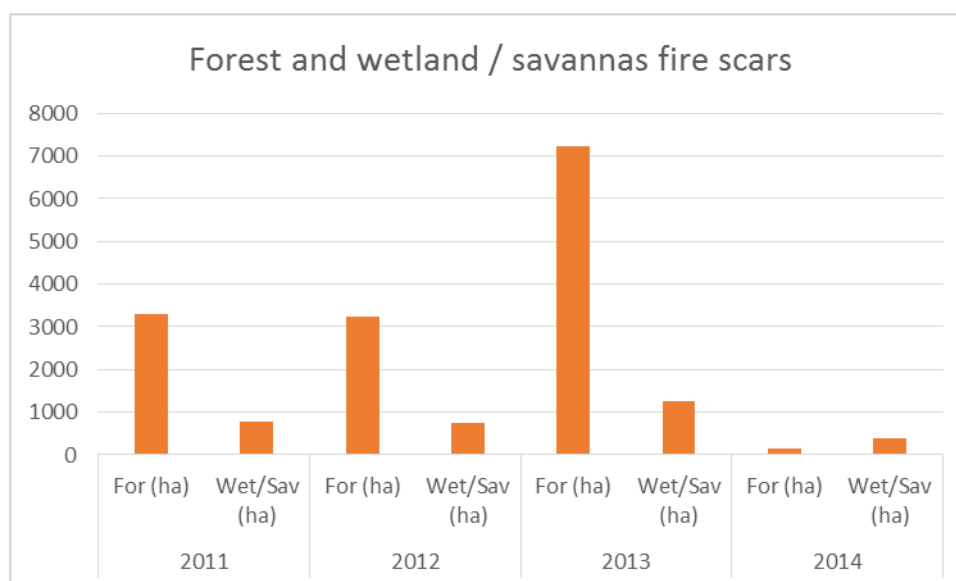


Figure 75 Fire scars according to ecosystems

Figure 75 shows that the intensity of the registered forest fires has decreased by 2014. However, in 2013 was recorded 7221 ha affected by forest fires.

For the communities of the first instance, in 2014 is recorded a loss of 14 ha, in 2013 is recorded a loss of 454.9 ha and in 2012 is recorded a loss of 127.32 ha. For the period 2012 – 2014, 596.22 ha of forest have been affected for forest fires in the first instance areas (Table 53).

Table 53 Number of hectares affected by forest fires in the First Instance

Year	Cooperative / private properties	N° forest fires	Affected areas (ha)
2012	La Lucha	2	40
	UMI	4	37.32
	La Técnica Agropecuaria	1	25
	Naranjitos (Tesoro Escondido)	1	25
	Total	8	127.32
2013	La Lucha	2	16
	UMI	0	0
	La Técnica Agropecuaria	1	10.5
	Centro Campesino	2	428.4
	Total	5	454.9

Year	Cooperative / private properties	N° forest fires	Affected areas (ha)
2014	La Lucha	-	1
	UMI	-	10
	La Técnica Agropecuaria	-	3
	Total	-	14

GL3.2 / GL3.3 / GL3.4 Presence of Endangered Fauna

According to the 2006-2010 Master Plan, within the park, the jaguar is distributed both in primary forest (“High” or “Medium Forest” of flatlands, mountains, and lowlands) and in regenerating forest. Based on the aforementioned, the estimated distribution area of jaguars within the park is approximately 150,255 hectares (1,502.55 km²). Based on the area of Calakmul, the resulting jaguar home range – the territory occupied by one individual – is estimated to be 15-22 km² per jaguar. Using the most conservative figure, a home range of 22 km² per individual, it is estimated that there are sixty-eight (68) individuals in Sierra del Lacandón National Park (PNSL).

A more conservative estimate of the jaguar population, based on a home range of 30 km² per jaguar as reported by Ceballos (2002), estimates a total jaguar population of 51 in PNSL and 203 in the Lacandón Jungle of Chiapas (state of Mexico) and Petén (department of Guatemala). It is important to mention that previous estimate erroneously assumed a homogenous distribution of jaguar within the park and in the Selva Maya, rather than a distribution based on preferential habitat, as occurs naturally. Within PNSL, Del Valle and Morales (2004), suggest that the conditions within the zone surrounding the Macabilero stream make it one of the most important areas for the jaguar, citing the work of MacNab and Soto (2000). This area is characterized as a large, continuous block of forest with little disturbance and contains abundant sources of water and high densities of prey species.



Figure 76 Installation of camera traps

The baseline was established by placing “camera traps”, motion activated cameras, in the field to obtain species presence data. The majority of mammalian species recorded via this method were present on the Council of National Protected Area’s List of Endangered Species and in CITES (wildlife protection treaty). As such, protection of these species through conservation is necessary to ensure the safeguarding of a viable breeding population.

The monitoring points were places in zones identified as having the greatest presence of the three priority threatened species: jaguar, tapir and white-lipped peccary (sampling methodology delivered to the auditor). Fifty (50) cameras spaced every two (2) km were placed in the field, covering an area of 200 km², a significant portion of the core zone of the SLNP. Current land use and topographic information from CEMEC was used to determine the type of topography and information on hydrography and access roads. Figure 77 displays the monitoring points as they correspond to areas of high value and importance for biodiversity.

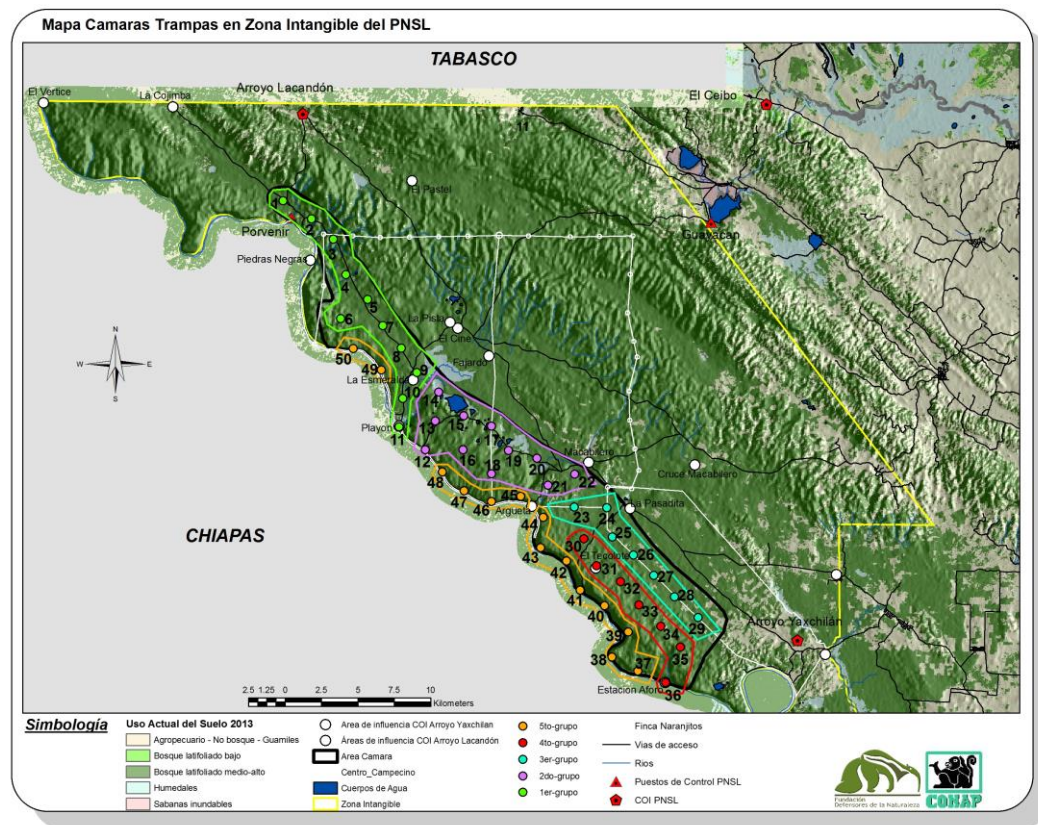


Figure 77 Location map of the camera traps.

Table 54 Field groups.

Group	N° of camera traps	N° kilometers	N° days	Difficulty
Argueta	7	16	2	Serrania
Macabilero	10	22	2	Serrania
Estación Aforo	6	14	2	Serrania
Río	17	36	2	Little slopes, long route
Estación Porvenir	10	22	2	Flat land, road closed

The camera traps remained in the core zone for 90 days. During this time, the functionality of the camera was verified every 15 days, especially in the areas of greatest human pressure (Macabilero, Estación aforo and Argueta). In addition, the memory card and batteries were changed to ensure the correct operation of the cameras and to process and digitize the results from the collected images.

In the case of jaguar, six individuals (three males, two females, and one of unidentified sex) were identified in 2011 in the monitored zone. This sampling was conducted in "High Forest". In the same sampling, twenty-three (23) mammalian species were identified, of which eighteen were identified as potential prey species for jaguar.

During the monitoring period, thirty-nine individuals were identified. A relevant data was the presence of a female, which physical characteristics evidenced that she probably recently gave birth. While 17.9% of individuals were identified in High Forest, 82.1% were identified in areas adjacent to rivers. The jaguar is present in 51% of the core zone.

	Jaguar (<i>Panthera onca</i>)			
Monitoring period	04/02/2011 - 09/04/2011		16/07/2014 - 19/10/2014	
Municipality	Las Cruces		Las Cruces / Libertad	
Vegetation type	High Forest		High Forest and water bodies (Rivers)	
Number of records	Male	3	Male	-
	Female	2	Female	1
	No data	1	No data	38
	Total	6	Total	39

Regarding the tapir, in 2011, 58 individuals were recorded in the municipalities of Las Cruces and La Libertad. Some records show that the tapir is moving in pairs.

In 2014, FDN have the record of 114 monitoring data. Both monitoring were performed in the type of vegetation High Forest.

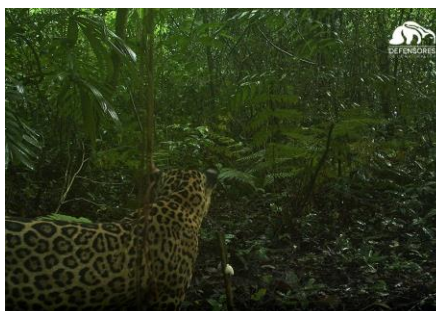
	Tapir (<i>Tapirus bairdii</i>)			
Monitoring period	04/02/2011 - 14/04/2011		16/07/2014 - 19/10/2014	
Municipality	Las Cruces / Libertad		Las Cruces / Libertad	
Vegetation type	High Forest		High Forest	
Number of records	Male	-	Male	-
	Female	-	Female	-
	No data	58	No data	114
	Total	58	Total	114

By 2014, more than 50 % of data records show that white-lipped peccary walked in groups of 3,4,5,6,7,8,9 and 10 individuals.

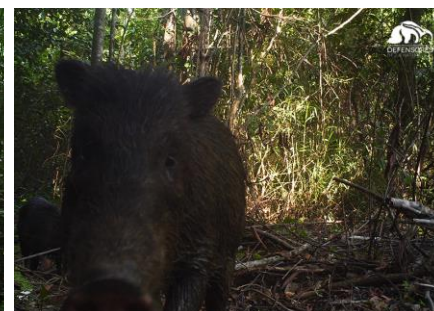
	Pecari Labio Blanco (<i>Tayassu pecari</i>)			
Monitoring period	04/02/2011 - 28/02/2011		16/07/2014 - 19/10/2014	
Municipality	Las Cruces / Libertad		Las Cruces / Libertad	
Vegetation type	High Forest		High Forest	
Number of records	Male	-	Macho	-
	Female	-	Hembra	-
	No data	3	No data	123
	Total	3	Total	123



Tapirus bairdii



Panthera onca



*Tayassu pecari*⁶⁵

⁶⁵ Photos by Defensores de la Naturaleza. Availables at <http://www.guatesostenible.com/camaras-de-trampa-revelan-tesoros-animales-en-sierra-de-lacandon-peten/>

Table 55 Species recorded in the monitored area

Year	Species		
2011	<i>Philander oposum</i>	<i>Cuniculus paca</i>	<i>Panthera onca</i>
	<i>Didelphis marsupialis</i>	<i>Sylvilagus sp.</i>	<i>Puma concolor</i>
	<i>Didelphis virginiana</i>	<i>Urocyon cinereoargenteus</i>	<i>Tapirus bairdii</i>
	<i>Didelphis sp.</i>	<i>Nasua narica</i>	<i>Tayassu pecari</i>
	<i>Dasypus novemcinctus</i>	<i>Eira barbara</i>	<i>Tayassu sp.</i>
	<i>Sciurus sp.</i>	<i>Conepatus semistriatus</i>	<i>Mazama temama</i>
	Muridae	<i>Leopardus pardalis</i>	<i>Odocoileus virginianus</i>
	<i>Dasyprocta punctata</i>	<i>Leopardu swiedii</i>	
2012	-		
2013	-		
2014	<i>Sciurus sp.</i>	<i>Tayassu pecari</i>	Ratón
	<i>Dasypus novemcintus</i>	<i>Panthera onca</i>	<i>Didelphis marsupialis</i>
	<i>Nasua narica</i>	Rabbit	<i>Cuniculus paca</i>
	<i>Dasyprocta punctata</i>	<i>Photos flavus</i>	<i>Leopardus wiedii</i>
	<i>Tapirus bairdii</i>	<i>Leopardus pardalis</i>	<i>Odocoileus virginianus</i>
	<i>Eira barbara</i>	<i>Pecari tajacu</i>	<i>Mephitis macroura</i>
	<i>Crax rubra</i>	<i>Puma concolor</i>	<i>Urocyon cinereoargenteus</i>
	<i>Buteo albonotatus</i>		

Illegal Activities in the Project Zone

The main xate species (leaves collected for sale as palm fronds) of commercial importance found within the park are: (1) *Chamaedorea elegans* (English: Parlour Palm or Neanthe Bella Palm Spanish: xate hembra); (2) *Chamaedorea ernestii-agusitii* (En: Ernest August's Palm or Understory Fishtail Palm; Sp: cola de pescado); (3) *Chamaedorea oblongata* (Sp: xate jade); and (4) *Chamaedorea ssp.* (Sp: xate tepejilote).

Xate was selected as conservation target because:

- It is considered to be highly threatened;
- Some influential communities within the park are interested in its cultivation through plantations;
- Extraction of wild plants is strongly tied to the culture of Petén, placing a high degree of pressure on these species.

Méndez (1998) studied wild xate populations in the area of the Unión Maya Itzá (UMI). The study assessed plant density (number of plants per hectare), plant height, the quantity and measurement of usable leaves, the quantity of leaves cut, and the total number of leaves per plant within the sample plot. The following was determined:

- Greater density of *Chamaedorea* spp. was found on hills versus flat areas. There were found 2,288 “gruesas” of *C. elegans*, 2,502 “gruesas” of *C. ernestii-agusitii*, and 10,847.82 “gruesas” of *C. oblongata*. The number of live leaves in flatland forests was 16 “gruesas” per hectare. The author, based on data from Mas (1993), suggests that this observation is likely due to the fact that the plants prefer zones above 300 meters in altitude and that more plants are found within the higher ranges of the sampled zone because it falls between 0 and 212 Meters Above Sea Level (MASL).
- With regard to harvestable leaves, which can be used to calculate the potential of a given area, the flatland forest had three (3) “gruesas” of quality leaves per hectare. It was determined that the population of the flatland forest is very degraded, with *C. elegans* accounting for 11% of the total population, *C. ernestii-agusitii* accounting for only 23%, and *C. oblongata* accounting for 25%.

All populations of xate (genus *Chamaedorea*) located within the territory of PNSL are included as foci for conservation. The potential area for xate conservation within the park is estimated to be approximately 58,000 hectares.

The extraction and harvest of xate results in forest degradation. As such, it is important to monitor and strengthen the institutional presence within the park. Table 56 shows that 350 xate leaves were confiscated during the monitoring period.

Table 56 Number of xate leaves detected illegally extracted

Year	Number of leaves
2011	208
2012	50
2013	0
2014	300

Furthermore, FDN manages to stop people doing illegal activities related to hunting, extraction of non-timber and timber products, and extracting wildlife. In total, 23 people were captured in the monitoring period (Table 57).

Table 57 Illegal activities

Year	Illicit activity	Number of persons	Total
2012	Hunting	2	7
	Non-timber extraction	-	
	Timber extraction	5	
	Wildlife extraction	-	
2013	Hunting	-	4
	Non-timber extraction	-	
	Timber extraction	1	
	Wildlife extraction	3	
2014	Hunting	-	12
	Non-timber extraction	1	
	Timber extraction	9	
	Wildlife extraction	-	
	Usurpation of lands	2	

Similarly, legal proceedings on illegal admitted to prosecutors and segregated for crimes committed each year are presented.

Table 58 Legal proceedings

Year	Infraction	Number of Legal proceedings
2012	Usurpation of protected areas	1
	Attack on Natural and Cultural Heritage of the Nation	10
	Total	11
2013	Usurpation of protected areas	1
	Attack on Natural and Cultural Heritage of the Nation	10
	Theft	1
	Total	12
2014	Attack on Natural and Cultural Heritage of the Nation and Illicit fauna and flora traffic	3
	Attack on Natural and Cultural Heritage of the Nation	4
	Attack on Natural and Cultural Heritage of the Nation and Usurpation of Protected Areas	3
	Usurpation of protected areas	1
	Total	11

8.1.1 High Conservation Value

B2.4 / GL1.2 It is possible to generally determine the state of ecosystems in the project zone by monitoring three indicator species: the jaguar (*Panthera onca*), tapir (*Tapirus bairdii*), and the white-lipped peccary (*Tayassu pecari*).

This is possible due to species like the jaguar are very sensitive to indicators of ecosystem intactness, such as pressure from hunting and changes in habitat, and changes in water sources. In addition, because the jaguar is a predator high in the food pyramid, it plays an important role in tropical ecosystems. Its presence indicates that there is sufficient prey to support its feeding requirements, and therefore, the jaguar is associated with high levels of biodiversity and ecosystem functioning.

The tapir is also a good indicator of deforestation, because the tapir requires large areas to roam; protecting itself in this manner indirectly protects other animals as well, resulting in greater biodiversity over a large extent.

Lastly, the white-lipped peccary helps to disperse plants and forms part of the trophic chain as a top predator, along with the puma and the jaguar.

The monitoring was performed using a “camera trap” method. Bushnell Trophy Cams were used, because they are designed to resist water and extreme environments including humidity and high temperatures. This digital camera is activated by a high sensitivity motion sensor, which uses an infrared passive motion sensor.

The monitoring points were places in zones identified as having the greatest presence of the three priority threatened species: jaguar, tapir and white-lipped peccary (sampling methodology delivered to the auditor). Fifty (50) cameras spaced every two (2) km were placed in the field, covering an area of 200 km², a significant portion of the core zone of the SLNP. Information from CEMEC was used to examine current land use, hypsography (topography), hydrography, and access roads.

The records of threatened wildlife show the presence of 39 jaguars, 114 tapirs and 123 white-lipped peccaries (Refer to Section 8.1 for more information).

Conservation of threatened species—those with identified natural high conservation value (HCV1)—lies at the core of the project’s activities. The recovery of ecological niches for endemic, vulnerable or threatened species is favored. The HCV are not expected to be negatively affected by the project. By reducing the deforestation rate in the project area, the project will preserve the habitat for endangered and vulnerable species. Different institutional patrols will monitor its boundaries and areas of influence. For measures taken refer to Section 2.4.

B2.5 The project use native species for its agricultural and forestry activities. Invasive species will not be used.

Species used in the project include the following:

Table 59 Species used in project activity

Scientific name	Spanish name	English name
<i>Cedrela odorata</i>	Cedro	Spanish Cedar
<i>Swietenia macrophylla</i>	Caoba	Large-leaved Mahogany
<i>Brosimum alicastrum</i>	Ramón	Breadnut
<i>Theobroma cacao</i>	Cacao	Cocoa
<i>Pimenta dioica</i>	Pimienta	Allspice

The project will have a positive impact on biodiversity outside the project area. This positive impact could also include improvement of the habitat conditions for such threatened species as the tapir (*Tapirus bairdii*), of which few individuals are left in the rest of protected areas of Guatemala.

Forest species used are raised in local forest nurseries. Species in high demand include “xate cola de pescado” (*Chamaedorea ernesti-augustii*), ramon (*Brosimum alicastrum*), allspice (*Pimenta dioica*), cedar (*Cedrela odorata*), and mahogany (*Swietenia macrophylla*), among others. The conservation projects for forest enrichment and/or recovery have been established and managed by groups organized at the community and/or family level in the communities of Villa Hermosa, Pozo Azul, Arroyo Yaxchilan and La Lucha cooperative.

The project has achieved 123 hectares with forest enrichment, 45 hectares with reforestation maintained in community boundaries, and 448 hectares with forest conservation in community boundaries through forest incentives. Efforts focus on consolidating what has been achieved, incorporating new areas and communities, and through sustainable forest management of timber and non-timber resources.

B2.6 As information becomes available, new species could be introduced, taking into account their invasive potential. No species that are likely to have a negative effect will be used. The population of any invasive species will not increase as a result of the project since the project proponent promote the use of native species as described in B2.5. No potential negative environmental impacts could result from the use of fertilizers or pesticides due to the species that will be use in the project are mostly native.

Native species were used exclusively in order to conserve local biodiversity and manage the forest in a sustainable way. However, working with these species brings some difficulties, since it is often not possible to find seeds in the market. For that reason, forest nurseries were established in Sierra del Lacandón National Park. In addition, the project works directly with community agroforestry promoters to transmit knowledge regarding the management, importance, and benefits (medical, food, etc.) of maintaining native species in the communities.

ACOFOP provides technical assistance and support for communities to generate and/or update their General Forest Management Plans, allowing them to apply for certified sustainable forest management status.

B2.7 The activities envisioned by this project do not foresee the use of non-native species or Genetically Modified Organisms (GMOs). Seeds collected in the project area are used to establish tree nurseries, as described in B2.6. Also, communities selected the species they want to use in their forest. For example, La Lucha cooperative selected native species of great commercial value, such as cedar (*Cedrela odorata*), mahogany (*Swietenia macrophylla*), Ramon (*Brosimum alicastrum*) and Manchiche (*Lonchocarpus castilloi*) to increase the value of its forests, since these species are rare in the forests of their community.

B2.8 Basic grains are the main source of carbohydrates (65%) and protein (71%) in the diet of Guatemalans. The main crop is corn. The contribution of corn in energy and protein per capita is 37.7% and 36.5% respectively; in comparison with the black bean with values of 9.5% and 22.9%. These basic grains ensure food security and survival of the population⁶⁶. Some persons in the project area use agrochemical in low concentration and green label for corn and bean crops. For the monitoring period, the community members continue using these agrochemicals, but as they are green label products, they are

⁶⁶ Fuentes, M. 2002. El Cultivo del Maiz en Guatemala. Una guía para su manejo agronómico. Available at <http://www.icta.gob.gt/maiz/cultivoMaizManejoAgronomico.pdf>

non-toxic for humans and are only toxic to corn pests (fall armyworm). However, mitigation actions for the use of agrochemicals are taken into account, as described below. Also, FDN is working on organic fertilizers, such as Bocashi (organic fertilizer based on rice husks) and Madrifol (foliar fertilizer), as well as organic insecticides like Chiltepol (insecticide based on chili).

For the monitoring period, fourteen (14) workshops on environmental education and sustainable production were held, and eleven (11) agroforestry promoters were trained. Both of these activities aimed to improve and accomplish sustainable farming.

The possible adverse effects for the use of fertilizers, chemical pesticides, biological control agents and other inputs used are:

- **Fertilization**

When using fertilizers, is important to establish the optimum composition, nutrient concentrations and the type of materials used in its production, as certain components can alter the biochemical characteristics of soil and water, accelerate the process of eutrophication in aquatic systems and negatively affect the crop production.

It is important to distinguish between the mere presence of a contaminating substance and its role as a pollutant due to its location, concentration and adverse biological or toxic effects. Nitrate and phosphate, for example, are essential nutrients to plants but may become pollutants if present in excessive quantities⁶⁷.

Sometimes, this excessive use of chemical fertilizers and / or applications at unsuitable times (for both crops and environmental components) may adversely affect the environment, altering the balance of nutrients in the soil, changing the pH, salinity, and pollution of water bodies caused by discharges of chemical waste.

In the process of fertilization, a certain degree of non-reusable waste (plastic containers and agrochemicals etc.) is produced. Project participants should clearly identify this type of material, to proceed with the proper method of storage and disposal.

- **Weed control, Pest and diseases**

The excessive use of herbicides to eradicate weeds, pollutes natural systems directly influencing the quality of the soil resources, water and air; and indirectly flora and fauna altering biological activity and interactions of many native species. Improper control of pests and handling of chemicals, pollutes soils and areas where they are applied, including water bodies as a result of run-off and movement through the soil from areas where is used in farming.

In agroforestry systems agro-ecological practices are promoted. However, the Strategy 3 of the project activities is to improve the productivity of the family management systems and to invest in the necessary education that leads to lower necessities for deforestation. This is particularly relevant for slash and burn practices commonly applied in the region. It also pursues the study and understanding of current agricultural practices in order to be able to analyze practices that can be improved satisfying basic household needs at lower environmental costs.

⁶⁷Van Lynden (1995). Cited by: FAO. 2004. Guiding Principles for the quantitative Assessment of Soil Degradation with a focus on salinization, nutrient decline and soil pollution. Source: <ftp://ftp.fao.org/agl/agll/docs/misc36e.pdf>

B2.9 Mitigation of impacts is based on best prevention practices to avoid ecosystem damages. However, if monitoring records any negative impacts, studies will be conducted to determine the specific sources of pollution, in order to seek alternatives to harmful agrochemicals.

- For handling chemical products, recommendations of the technical data and field technicians should be followed, including the security and safety standards and other procedures determined by Fundación Defensores de la Naturaleza, for the work of handling, mixing and application of agro-inputs.
- Those responsible for handling pesticides, should wear protective equipment, in order to avoid poisoning and health damages.
- The packages and containers of chemicals will be classified and disposed as hazardous waste. Each community present a landfill where any waste product from the project activities are collected.
- The packages and chemical containers should not be reused for any purpose.
- Training on the use and management of agrochemicals complemented with environmental education workshops.

In this monitoring period, there has been little progress. The community members collect waste for deposit in specific landfills. These mitigation actions will be addressed as priorities for the next monitoring period.

B4.3 All results will be publicly available on the internet and summaries are communicated to the Communities and Other Stakeholders through appropriate medios. Additionally, all documents and information about the results of the monitoring and verification of this project will be published in the platforms of the VCS and CCB standards as usual.

FDN has extensive experience with dissemination of the project to communities. The most effective medium agreed with communities is the dissemination of periodic newsletter reporting the progress of the project in all its phases. The project considers the translation of important documents to Q'eqchi language. The monitoring plan and monitoring result are disclosed through the governance committee and workshops with communities.

For the monitoring period, the January 24, 2016, meeting minutes of the governance committee state awareness of the validation and verification documents and their availability online for consultation (proof of documentation made available to auditor). Furthermore, the internal regulations of the committee describe the consultation of the project progress within cooperatives and surrounding communities through the representatives of the general assembly, which have been responsible for sharing information about validation and verification of the project.

8.2 Negative Offsite Biodiversity Impacts

B3.1 – B3.3 Lacandón - Forests for Life REDD+ Project focuses on reducing deforestation to ensure that ecosystem services continue over time, cultural and archaeological heritage is preserved and the emission of greenhouse gases from deforestation and degradation is avoided. In addition, the project focuses on improving the living conditions of the communities located within and surrounding the park boundaries.

Until the reporting monitoring period, there are no negative impacts to biodiversity caused by project activities due to one main project objective is forest conservation. One potential negative impact would be the result of leakage. However, the project proponents are committed to monitoring deforestation within and outside the project zone. In addition, there are activities planned to reduce leakage effects and this potential impact is constantly monitored by the FDN team.

The project also provides additional protection to the area allowing natural regeneration to occur and provides refuge to wildlife species. The presence of species listed as endangered by the International Union for Conservation of Nature (IUCN) and included on the Red List have been documented in the park. These species include Jaguar - *Panthera onca* (Near Threatened), Tapir - *Tapirus bairdii* (Endangered) and White-lipped peccary - *Tayassu pecari* (Vulnerable) for fauna and cedar - *Cedrela odorata* (Vulnerable) and mahogany - *Swietenia macrophylla* (Vulnerable) for flora.

The project is conserving 45,288.81 ha of forest, while the unmitigated negative impacts on biodiversity outside the project zone (deforested areas) are 3,953.07 ha (Table 16) for the monitoring period. The project does not consider a decrease in carbon stocks and increased emissions resulting from leakage (Table 18). It is not expected emissions from displacement since the areas of the first instance have legal land tenure. Therefore, the net effect of the project on biodiversity is positive.

B3.2 Mitigation measures are the continuous patrols carried out and to strengthen of inter-institutional presence in the SLNP. The project also serves as an example of good practices and innovative approaches in the communities regarding to biodiversity (reforestation and enrichment activities, agroforestry systems) that can be adapted by outside communities (Refer to Section 8.1).

8.3 Exceptional Biodiversity Benefits

GL3.1 The project area is included within the Key Biodiversity Area (KBA) Selva Lacandóna and Sierra del Lacandón (Mexico/Guatemala)⁶⁸. By avoiding deforestation in a KBA the Lacandón - Forests for Life Project generates Exceptional Biodiversity Impacts.

In addition, the tropical forests of northern Guatemala are considered as a "biodiversity hotspot", since they have the most diverse of the most threatened ecosystems of our planet. The Mesoamerican forests are the third largest among the world's hotspots. Their spectacular endemic species include quetzals, howler monkeys, and 17,000 plant species. Spanning most of Central America, the Mesoamerica Hotspot encompasses all subtropical and tropical ecosystems from central Mexico to the Panama Canal. This includes all of Guatemala, Belize, El Salvador, Honduras, Nicaragua, and Costa Rica, as well as a third of Mexico and nearly two-thirds of Panama. Due to large-scale deforestation, only 20 percent of the original,

⁶⁸ Critical Ecosystem Partnership Fund. 2010. Assessing Five Years of CEPF Investment in the Mesoamerica Biodiversity Hotspot. Available at http://www.cepf.net/Documents/Final_NMesoamerica_Assessment_Jan2010.pdf

preindustrial land remains mostly untouched or not severely damaged. In order to expand agriculture, farmers have cut down and burn forests to access more fertile soils. The loss of natural habitat drives the continued loss of biodiversity in Mesoamerica.



Figure 78 World biodiversity hotspots.

During the monitoring period 2012-2014 were identified the presence of jaguar, tapir and white-lipped peccary in the project area, these three species require large areas of continuous forest to maintain viable populations over time. Species under constant threat and listed on IUCN Red List. These species are closely associated with native and primary forest; therefore; conservation strategies are developed to protect the forest and the threatened species. On the other hand, the monitoring can also identify and record the presence of other animals as described in Table 55.

Vulnerable, Endangered or Critically endangered species

The little knowledge available on floristic and fauna present in the project zone suggest that the species records that are currently available in the area could be extended if proper monitoring is developed. The project will monitor fauna and flora following systematic and scientific methods and will collaborate with Universities and other institutions that may bring additional knowledge on the biodiversity present in the project zone.

Many of the areas of the project remain to be explored, and logically there are no records of the biodiversity present. This applies specially for the area of sinkholes. This project has chosen to conservatively apply the classification of IUCN red list⁶⁹, which may not describe in detail the biodiversity present in the project area, nor the locally threatened species, but provides an international classification of the status of species occurring in the project zone.

⁶⁹ Available at: <http://www.iucnredlist.org/>

The fauna and flora species identified at IUCN red list as Vulnerable, Endangered or Critically endangered within the project zone are listed in Table 60.

Table 60 List of Vulnerable, Endangered or Critically Endangered species present in SLNP.

Latin name	English name	Status at IUCN red list
<i>Crocodylus moreletii</i>	Morelet's Crocodile	Least Concern
<i>Crax rubra</i>	Great Curassow	Vulnerable
<i>Electron carinatum</i>	Keel-billed Motmot	Vulnerable
<i>Eleutherodactylus leprus</i>		Vulnerable
<i>Megalops atlanticus</i>	Tarpon	Vulnerable
<i>Agamia agami</i> *		Vulnerable
<i>Alouatta pigra</i> * ^a	Yucatán Black Howler Monkey	Endangered
<i>Ateles geoffroyi</i> * ^a	Geoffroy's Spider Monkey	Endangered
<i>Balantiopteryx io</i> *	Thomas's Sac-winged Bat	Vulnerable
<i>Craugastor alfredi</i> *		Vulnerable
<i>Cryptotis griseoventris</i> *	Guatemalan Small Eared Shrew	Vulnerable
<i>Myrmecophaga tridactyla</i> *	Giant Anteater	Vulnerable
<i>Tapirus bairdii</i> *	Baird's Tapir	Endangered
<i>Tayassu pecari</i>	White-lipped peccary	Vulnerable
<i>Cedrela odorata</i>	Spanish Cedar	Vulnerable
<i>Swietenia macrophylla</i>	Large-leaved Mahogany	Vulnerable

* Species described by IUCN red list to be in the project area but not recorded directly;

^a Species recorded during site visits (videos available for auditors upon request).

See PDD Appendix I, II and III for a complete list of plants and animals species known in the project zone.

GL3.2 In the core zone of SLNP, a biodiversity base line was performed, where three items of conservation were selected: The near threatened Jaguar (*Panthera onca*), the largest feline in Latin America and part of the Guatemalan culture for years; the endangered Tapir (*Tapirus bairdii*), largest land mammal in the Neotropics and the only living representative of perissodactyla order, is a species considered nationally endangered and throughout its range, and vulnerable White-lipped Pecari (*Tayassu pecari*), is threatened due to strong illegal hunting. These were identified by the availability of information,

expert criteria, viability of the species and if it were present in the lists of species threatened CITES and List of Threatened Species of the CONAP.

Tapir and White-lipped Pecari distribution in Guatemala have dropped dramatically over the past century, causing populations to be restricted to protected areas of the northeastern region of the country. According to the International Union for Conservation of Nature (IUCN), the tapir is on the Red List of threatened species due to the reduction of their populations. A regional and local level the main threats are loss and habitat degradation, and to a lesser degree hunting. Therefore, it can be deduced the local extinction of the species is associated with land use change and the consequent habitat fragmentation⁷⁰.

GL3.3 These three species require large tracts of continuous forest to maintain viable populations over time, so generating mechanisms or tools for conservation habitat, are protecting other species that share the same habitat type, allowing there a balance of the ecosystem.

Measures taken are the same as for the Area of High Conservation Value 1: Biodiversity and threatened species:

- Annual monitoring of endangered wildlife and indicator of stable ecosystems.
- Register of other species in the project zone through camera-traps sampling.
- Patrols conducted to avoid invasions.
- Awareness and workshops on forest fires.
- Control over illegal extraction of natural resources.
- Generate research and wildlife management threatened.

GL3.4 Indicators for the three trigger species are include in the monitoring plan under “Presence of endangered fauna” indicator. The monitoring is performed using the camera trap method. This method is used for multiple purposes, from identify individual specie to assess population size and various aspects of their ecology and behavior. For this reason, using camera traps in one of the most important and versatile methodologies for studies of biological research for conservation purposes.

The project monitoring show the increase in population of the three threatened species (Refer to Section 8.1). Without the project activities, it is expected that the population of these species reduce dramatically due to land use change and hunting since there is a tendency in reducing coverage and degradation (fragmentation) habitats, highlighting the vulnerability of the species populations in the zone.

⁷⁰ Garcia, M & Leonardo, R.2016. Classification of the potential habitat of the Central American tapir (*Tapirus bairdii* Gill, 1865) for its conservation in Guatemala. Available at http://www.revistas-conacyt.unam.mx/therya/index.php/THERYA/article/viewFile/345/pdf_114

9 ADDITIONAL INFORMATION

ANNEX I

Efectos Indirectos Sociales
Proyecto REDD+ Lacandón Bosques para la Vida

Nombre:

Comunidad:

Género:

F

M

Edad:

20-28

_____ 36-45

29-35

_____ 46-60

_____ Más de 60

Número de hijos/as total
y por familia:Tasa de mortalidad
infantil:Tipo de servicio sanitario
de los socios:

nada

_____ letrina seca

hoyo

_____ fosa séptica

_____ N/A

Número/porcentaje de
hijos/as menores de 15
años trabajando o
colaborando en el trabajo
de sus padres:Persona que genera
ingreso:

solo esposo

_____ ambos cónyuges

solo esposa

_____ conyugues y otros

_____ N/A

Ingreso mensual:

menos de 1,000

_____ 2,000 a 3,000

1,000 a 2,000

_____ 3,000 a 4,000

_____ más de 4,000

**Tipo de actividad que
aporta mayores ingresos**

Agricultura	_____	tiendas domésticas	_____
Remesa familiar	_____	PINFOR	_____
jornal trabajador dependiente	_____	intermediación en la comercialización de productos agrícolas	_____
crianza de animales	_____	Otras fuentes	_____

**Número/porcentaje de
socios y sus
compañeros que fueron
a la escuela****Último grado aprobado**

sin educación	_____	Ciclo Básico completo	_____
Primaria	_____	Diversificado incompleto	_____
Primaria completa (6to primaria)	_____	Diversificado completo	_____
Ciclo Básico incompleto	_____		

**Número/porcentaje de
hijos/as asistiendo la
escuela y grados
aprobados****3 enfermedades más
frecuentes****Número de variedades
cultivadas en la parcela****Número/porcentaje de
socios que tiene vehículo****Tipo de servicios activos
en la comunidad
(energía, comunicación,
educación, agua,
servicios de salud,
transporte, etc.)**

Electricidad	_____	Agua	_____
Comunidades	_____	Salud	_____
Educación	_____	Transporte	_____

ANNEX II

Table 61 Deforestation in the project zone 2010-2014

Community / Private property	Total area (ha)	Forest cover lost 2010-2012 (ha)	Forest cover lost 2012-2014 (ha)	Total Forest cover lost 2010-2014 (ha)
Private property				
Naranjitos	30807.158	3.332	0.180	3.512
Centro Campesino	8392.723	93.482	28.803	122.285
Community				
La Técnica Agropecuaria	4642.029	53.500	37.200	90.700
Unión Maya Itzá	6068.236	402.315	220.637	622.952
La Lucha	3974.028	157.657	97.711	255.369
Guayacán	6337.273	380.253	532.396	912.648
Bethel	4083.523	77.530	7.117	84.647
Las Flores	1600.853	0.360	9.441	9.802
Las Ruinas	3903.668	12.973	102.644	115.616
Las Victorias	3600.878	63.777	135.328	199.106
Manantialito	2587.513	116.880	95.322	212.202
Nueva Jerusalem	4952.394	139.602	189.439	329.041
Nuevo San José	2004.502	0.000	9.279	9.279
Pozo Azul	1917.209	4.611	29.476	34.087
Retalteco	4429.121	151.833	86.620	238.453
San Juan Villa Nueva	3796.277	39.854	53.511	93.365
UNAC	1920.917	27.387	0.024	27.412
Villa Hermosa	2723.493	26.613	32.044	58.657
Total	97741.796	1751.962	1667.172	3419.134

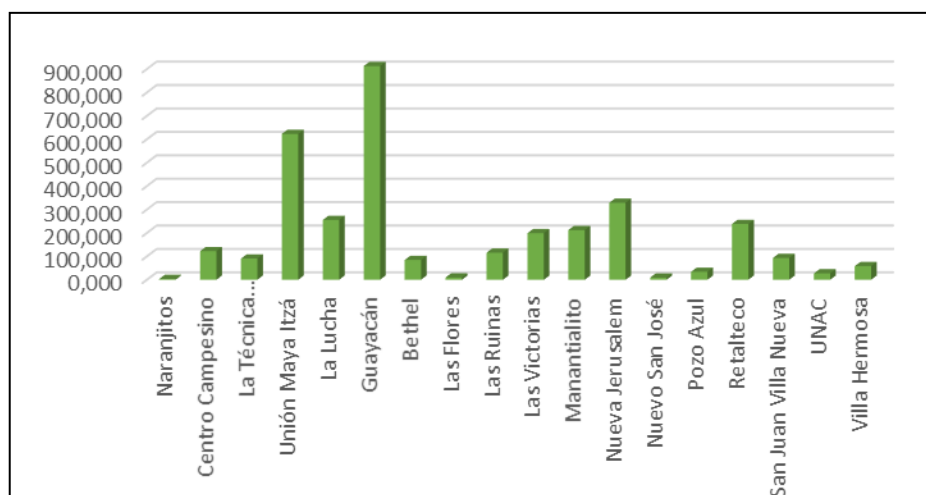


Figure 79 Deforestation (ha) 2010 – 2014 in the project zone

ANNEX III

Table 62 Events conducted in 2011

Event	Activity	Participants			Date
		Total	Women	Men	
Meeting	"Forest Conservation and Sustainable Development for Climate Change Mitigation in SLNP" Project Presentation	11	5	6	04/02/2011
Meeting	Defining the Forest Protection Incentive Program in Sierra del Lacandón National Park	35	9	26	03/2011
Meeting	Presentation and Discussion of the REDD+ Guatemala Implementation Initiative	9	2	7	18/03/2011
Meeting	Second Regular Meeting of the REDD+ Guatemala Implementation Group	6	1	5	21/07/2011
Meeting	SLNP Communities Meeting – Forest Conservation and Community Development	78	25	53	13/05/2011
Workshop	Impacts of Climate Change (CC) in Our Community: Técnica Agropecuaria	23	1	22	09/06/2011
Workshop	Impacts of Climate Change (CC) in Our Community: La Lucha	18	2	16	10/06/2011
Meeting	Presentation of SLNP Cooperation Agreements to CONAP	28	10	18	16/05/2011
Meeting	Interinstitutional meeting to integrate the topic of climate change into the departmental development plan	12	3	9	01/06/2011
Meeting	SLNP work team planning meeting	10	3	7	03/06/2011
Meeting	Supporting COCODES (Community Development Council) in the Proposal of Social and Reforestation Activities for the Communities of UMI, La Lucha, Bethel, and Técnica Agropecuaria	13	1	12	30/08/2011

Event	Activity	Participants			Date
		Total	Women	Men	
Training	Supporting the Basic Model of Climate Change (CC) Adaptation and Mitigation in the Communities of the Middle Usumacinta River Basin	16	1	15	27/08/2011
Training	Supporting the First Teaching Model for Climate Change (CC) Adaptation and Mitigation - Municipality of La Libertad	20	1	19	25/08/2011
Meeting	Meeting to Sign the Cooperation Agreement in Nueva Jerusalén II	14	0	14	23/08/2011
Meeting	Coordination of Project 298 ⁷¹	10	3	7	21/08/2011
Meeting	Meeting with the Communities in Nueva Jerusalén II	15	2	13	06/09/2011
Meeting	Interinstitutional Meeting in the Community of Guayacán	12	6	6	21/09/2011
Meeting	Presentation of Procedure and Administrative Structure to Project Personnel	10	4	6	29-30/09/2011
Meeting	DPM from La Libertad municipality, Petén, Staff Meeting to Coordinate Reforestation Activities	7	0	7	03/11/2011
Meeting	Meeting of Various Institutions to Promote and Build Support for Project 298	14	3	11	03/11/2011
Meeting	Technical Team Project Planning Meeting	17	6	11	17/11/2011
Meeting	Presentation of the Case Study "Xate Plantations in SLNP"	15	5	10	11/11/2011
Meeting	Project Advancements in Forest Conservation and Sustainable Development for Climate Change (CC) Mitigation	25	17	8	25/11/2011
Meeting	Interinstitutional Meeting for the Integration of the Topic of Climate Change	28	7	21	28/12/2011

⁷¹ Project 298 is "REDD+ Lacandón Project – Forests for Life" ("Bosques para la Vida")

Event	Activity	Participants			Date
		Total	Women	Men	
Meeting	Share information about activities related to the European Union gender group	6	6	0	01/12/2011

Table 63 Events conducted in 2012

Event	Activity	Participants			Date
		Total	Women	Men	
Meeting	Coordination Meeting	7	2	5	23/01/2012
Meeting	Activity Planning Meeting	15	4	11	27/01/2012
Training	Municipality of Las Cruces Staff Training – Environmental Laws, Environmental Resources, and Law Concerning Protected Areas	20	5	15	28/02/2012
Site visit	Advisory Committee Project Visit to La Lucha and Arroyo Yaxchilán	35	5	30	15-16/02/2012
Meeting	Park Meeting	21	4	17	03/02/2012
Meeting	Meeting for Internal Review of Incentive Rules	12	2	10	02/02/2012
Meeting	CONAP Work Meeting	15	2	13	14-15/03/2012
Training	La Libertad Staff Training Meeting – Environmental Legislation and Resources	28	4	24	07/03/2012
Meeting	Interinstitutional Meeting for COCODES Training	36	0	36	28/03/2012
Meeting	Coordination Meeting	26	7	19	27/03/2012
Meeting	Interactive Project Presentation: Forest Conservation and Climate Change Mitigation	9	5	4	30/04/2012
Meeting	Meeting with CONAP to Define Internal Zoning and Community Boundaries	8	2	6	07/05/2012
Meeting	Work Meeting on Cooperation Agreements	12	1	11	25/06/2012

Event	Activity	Participants			Date
		Total	Women	Men	
Training	Training of Field and Technical Personnel – Conflict Resolution, Constructive Communication, Negotiation, and Mediation	20	5	15	11-12-13/07/2012
Training	Training of Field and Technical Personnel – Conflict Resolution, Constructive Communication, Negotiation, and Mediation	19	5	14	29-30-31/08/2012
Training	Training of Field and Technical Personnel – Conflict Resolution, Constructive Communication, Negotiation, and Mediation	16	4	12	18-20/08/2012
Meeting	Work Meeting: Integrated Development Plan for Petén	9	3	6	09/2012
Meeting	Administrative and Technical Personnel Meeting – Reviewing Technical and Financial Project Advancements	5	2	3	04/09/2012
Field	Field Excursion with the Promoters of Rural Development of Villa Hermosa	16	0	16	12/09/2012
Training	Training of Field and Technical Personnel – Conflict Resolution, Constructive Communication, Negotiation, and Mediation	16	2	14	18-19-12/09/2012
Meeting	Monthly Technical Personnel Meeting	18	6	12	28/09/2012
Meeting	Technical and Financial Project Meeting	11	1	10	02/10/2012
Workshop	Monitoring Plan Risk, Strategy Review, and Development Workshop	18	7	11	22/10/2012
Training	Climate Change Training for Resources Protection Officers (“Guardarecursos”)	45	0	45	4-5/10/2012
Field	Project Visit – Reforestation in Agroforestry Systems	13	1	12	02/11/2012

Event	Activity	Participants			Date
		Total	Women	Men	
Meeting	COCODES Follow-Up Meeting on Cooperation Agreements in Nuevo Paraiso 107	17	7	10	08/11/2012
Meeting	COCODES Meeting in Nuevo Paraiso 107 – Follow-Up on Cooperation Agreements	17	0	17	06/11/2012
Training	Course in Basic Forest Fire Control Techniques	20	1	19	13/12/2012

Table 64 Events conducted in 2013

Event	Activity	Participants			Date
		Total	Women	Men	
Meeting	PDD Development Process Meeting with South Pole	19	4	15	21-23/01/2013
Training	Training Workshop – Follow-Up to the Negotiation of Cooperation Agreements with Arroyo Yaxchilán	15	7	8	26/02/2013
Meeting	Cooperation Agreement Follow-Up Meeting with the Communities of Nuevo Paraiso 107 and El Pital	18	0	18	06/02/2013
Meeting	Sustainable Community Development Follow-Up Meeting with UMI Cooperative	30	3	27	16/04/2013
Meeting	Coordination Meeting between CONAP and FDN	26	6	20	28/06/2013
Meeting	FDN Technical and Administrative Personnel Meeting	20	7	13	14/06/2013
Training	Training of Promoters of Rural Development	43	11	32	25/06/2013
Training	Training of Promoters of Rural Development	30	10	20	9-11/07/2013
Workshop	Conflict Resolution	25	5	20	24-25/07/2013
Field	Anniversary of the Signing of Villa Hermosa Agreements of Intent	50	12	38	30/08/2013

Event	Activity	Participants			Date
		Total	Women	Men	
Workshop	COCODES Training for San Juan Villa Nueva, Poza Azul and Villa Hermosa	35	4	31	16/08/2013
Training	REDD Mechanisms and their Implications for Guatemala (FDN Staff)	41	7	34	04/09/2013
Meeting	UMI Meeting to Avoid Land Sales in the Cooperative	49	8	41	29/08/2013
Meeting	Presentation of the La Lucha Community Project Proposal	20	2	18	18/09/2013
Meeting	Presentation of the Técnica Agropecuaria Community Project Proposal	17	5	12	19/09/2013
Meeting	Presentation of the Retalteco Community Project Proposal	16	2	14	19/09/2013
Meeting	Presentation of the Unión Maya Itzá Community Project Proposal	28	3	25	18/09/2013
Training	REDD Mechanisms and their Implications for Guatemala (FDN Staff)	32	8	24	5-6/09/2013
Meeting	Coordination Meeting with FDN Staff	6	4	2	17/09/2013
Meeting	Meeting for Development and Design of a Community Bulletin (Comic)	8	3	5	23/09/2013
Field	Promoter School Field Trip	34	8	26	22/10/2013
Meeting	FDN Technical and Administrative Meeting	18	4	14	07/11/2013
Meeting	UMI Cooperative Forest Fire Meeting	10	4	6	08/11/2013
Training	Training of Rural Development Promoters	30	3	27	13-14-15/11/2013

Event	Activity	Participants			Date
		Total	Women	Men	
Training	Training Workshop for COCODES y the Board of Directors of the Cooperative Técnica Agropecuaria	40	10	30	28-29/11/2013

Table 65 Events conducted in 2014

Event	Activity	Participants			Date
		Total	Women	Men	
Meeting	Introductory Informational Meeting on Cooperation Agreements with Group 107	19	2	17	31/01/2014
Meeting	Information Meeting on Agreements (with COCODES in micro-region El Naranjo)	43	5	38	09/02/2014
Meeting	Women's Group Meeting Nuez de Ramón in La Lucha cooperative	25	12	13	12/02/2014
Meeting	Counseling to Manantialito to formalize the Community Development Council (COCODE)	7	1	6	03/02/2014
Meeting	Forest Conservation and Community Development with UMI	12	1	11	25/02/2014
Meeting	Interinstitutional Meeting for Coordination and Updates of the Lacandón Project	10	3	7	01/02/2014
Meeting	SLNP Scholarship Students Informational Meeting	19	4	15	02/2014
Meeting	Technical Personnel Meeting - Project Advancements	14	6	8	26/02/2014
Meeting	Technical Meeting on Project Advancements	15	6	9	28/02/2014
Meeting	Conflict Management and Transformation with CONAP	15	11	4	07/03/2014
Meeting	Meeting with COCODE and UMI Board of Directors	20	2	18	04/03/2014
Meeting	Cooperation Agreements Meeting with El Pital	16	5	11	05/03/2014
Meeting	Planning Meeting – School of Promoters	5	2	3	06/03/2014
Meeting	Group Community Meeting – Arroyo Yaxchilán	15	5	10	04/03/2014
Meeting	Project Monitoring Meeting	9	4	5	03/03/2014
Meeting	REDD+ Implementation Group Activation and Work Advancements Meeting	9	5	4	14/03/2014

Event	Activity	Participants			Date
		Total	Women	Men	
Meeting	COCODES Villa Hermosa, Poza Azul, and San Juan Villa Nueva Meeting	20	1	19	27/03/2014
Meeting	Information Meeting PINPEP, Arroyo Yaxchilán Group	12	5	7	21/03/2014
Meeting	Delivery of Conservation Incentives and PINPEP Management Plan	24	12	12	28/03/2014
Meeting	II traineeship of the School for Promoters of Rural Integral Development	29	7	22	07/04/2014
Meeting	Project Planning Meeting	8	2	6	04/04/2014
Training	Management of Fruit and Forestry Nursery	3	0	3	14/04/2014
Meeting	Follow-Up Meeting on Integral Development Monitoring and Compliance Agreements ZUE-SLNP	14	6	8	02/05/2014
Meeting	Follow-Up Meeting of the Integrated Development and Fulfillment of Agreements (ZUE-SLNP San Juan Villa Nueva)	52	17	35	02/05/2014
Training	School for Promoters of Rural Integral Development (Module IV)	30	6	24	5-7/05/2014
Meeting	Work Methodology Definition for REDD+ Pilot Projects in Guatemala and Advancements in the Development of the PDD	24	4	20	13/05/2014
Meeting	External Evaluation of Project Forest Conservation and Sustainable Development in La Técnica and Arroyo Yaxchilán	10	0	10	19-20/05/2014
Meeting	External Evaluation of Project Forest Conservation and Sustainable Development in La Lucha	10	0	10	21/05/2014
Meeting	Financial and Technical Advancements Meeting	6	3	3	28/05/2014
Meeting	Meeting Related to Integrated Community Development Projects in Poza Azul	10	0	10	30/05/2014
Meeting	Technical and Administrative Advancements Meeting (FDN Staff)	19	8	11	16/06/2014

Event	Activity	Participants			Date
		Total	Women	Men	
Training	Camera Traps Training Meeting	13	1	12	03/06/2014
Training	School for Promoters of Rural Integral Development (Module V)	24	13	11	18-20/06/2014
Training	35 th International Course on Protected Areas, Biological Corridors, and Ecosystem Services	1	1	0	01-29/06/2014
Meeting	Follow-Up Experiential Community Outreach Techniques Workshop	24	9	15	10/07/2014
Meeting	Experiential Community Outreach Techniques Workshop	25	8	17	08/07/2014
Training	Rural Empowerment and Gender Equality Workshop – Central Office	15	7	8	15-16/07/2014
Training	Rural Empowerment and Gender Equality Workshop – Communities	22	10	12	17/07/2014
Meeting	Negotiation Techniques	9	3	6	12-13/08/2014
Training	School for Promoters of Rural Integral Development (Module VI)	30	11	19	13-15/08/2014
Meeting	Community Outreach Meeting for Monitoring Activities	22	6	16	15/08/2014
Meeting	Master Plan Meeting	6	3	3	04/09/2014
Training	School for Promoters of Rural Integral Development (Module VII)	40	12	28	23-25/09/2014
Meeting	Presentation of Biodiversity Monitoring Indicators	12	6	6	26/09/2014
Meeting	Project Advancements Review with Technical Staff	6	3	3	17/09/2014
Meeting	Follow-Up on Cooperation Agreements	4	2	2	18/09/2014
Meeting	Technical and Administrative Advancements Meeting with FDN Staff	6	2	4	29/09/2014
Meeting	Cooperation Agreements Follow-Up Meeting	8	3	5	30/09/2014
Field	Visit to El Subín Nursery	16	5	11	02/09/2014
Meeting	Manantialito Agreement Meeting	20	5	15	24/09/2014
Meeting	Follow-Up on Cooperation Agreements for the Naranjo Route	14	4	10	03/10/2014

Event	Activity	Participants			Date
		Total	Women	Men	
Meeting	REDD+ Project Consultation Meeting	9	1	8	13/10/2014
Meeting	Analysis de censo y acta de cierre con Grupo Arroyo Yaxchilán	5	2	3	15/10/2014
Meeting	Meeting to Present Boundary (Polygon) to Arroyo Yaxchilán	4	2	2	24/10/2014
Meeting	Master Plan Meeting	10	5	5	23/10/2014
Field	Field Visit to Project Lacandón: Forests for Life (Bosques para la Vida)	15	4	11	03/11/2014
Field	Local Organizations Visit to SLNP	20	5	15	04/11/2014
Meeting	REDD+ Project UMI Consultation	19	0	19	09/11/2014
Field	Field Visit to Project Lacandón: Forests for Life (Bosques para la Vida)	6	1	5	21-24/11/2014
Meeting	REDD+ Project Information Meeting with Institutions	6	0	6	24/11/2014
Meeting	UNAC Group Concerning Prevention of Forest Fires and Early Warning Systems	10	1	9	26/11/2014
Meeting	Meeting with UMI Forest Fire Committees	10	0	10	27/11/2014
Meeting	Meeting with Bethel Forest Fire Committees	10	0	10	28/11/2014
Meeting	Delivery of Forest Conservation Incentives and PINEP Management Plans	49	11	38	10/12/2014
Meeting	Health, Education, and Community Development Activity Planning	8	1	7	08/12/2014
Meeting	Follow-Up and Planning Meeting for REDD+ Consultations	6	1	5	16-17/12/2014