INTERNATIONAL TROPICAL TIMBER ORGANIZATION

ITTO

PROJECT DOCUMENT

TITLE:	ASSESSMENT AND DISSEMINATION OF KNOWLEDGE AND EXPERIENCE FOR EX-SITU CONSERVATION AND PLANTATION OF CAOBA IN NORTHERN COASTAL AREA, PERU
SERIAL NUMBER:	PD 932/23 (F) [CN-22014]
COMMITTEE:	REFORESTATION AND FOREST MANAGEMENT
SUBMITTED BY:	GOVERNMENT OF PERU
ORIGINAL LANGUAGE:	ENGLISH

SUMMARY

The Caoba ***(Swietenia macrophylla; King*)**, which grows in the tropical rainforest, **is of great commercial value**, but is now listed as an endangered species on CITES by illegal logging and forest pests and diseases. Peru was a major exporter of the tree in the 1990s, but now imports it.

This project was designed to prepare the foundation necessary to address the endangerment and increase its utilization. This project is interested in the ex-situ conservation and plantation of endangered Caoba not conservation in the habitat. The biggest achievement of this project is to create and distribute reports that systematize knowledge and experience through successful case analysis, and it is expected that this will help expand investment for the ex-situ conservation and utilization of Caoba in the mid to long term.

There are several successful examples of planting Caoba in semi-arid areas along the northern coast of Peru. The purpose of this project is to analyze such cases to prepare a foundation of knowledge and information that can be preserved by plantation in the semi-arid area along the northern coastal area of Peru.

The purpose of this project is summarized as follows.

- Systematizing and publishing the knowledge and experiences on Caoba planting.
- Expanding interest of government and businesses for investing in Caoba conservation and plantation.
- Enhancing social interest in Caoba conservation and plantation.

To this end, discussions, workshops, and training with the government, businesses, and various stakeholders will be developed while analyzing successful cases. Through this process, not only will knowledge for ex-situ conservation and afforestation of Caoba be secured, but also interest in conservation and investment in Caoba from the government, businesses and society will be enhanced.

The main beneficiaries will be a) The private sector, entrepreneurs, who have taken the initiative of establishing experimental plantations in this area, b) The communities owning the land for plantations, c) The public sector and NGOs related conservation.

This project proposal is supported by the National Forest Administration (SERFOR), the association of forest plantations in the northern coastal region of Peru, the regional Government of Lambayeque and several rural communities of this region as well as research and academic institutions

EXECUTING AGENCY: COSTA VERDE INICIATIVA 20X20

COLLABORATING AGENCIES:

DURATION: 12 MONTHS

APPROXIMATE STARTING DATE: UPON APPROVAL

BUDGET AND PROPOSED SOURCES OF FINANCE	Source	Contribution in US$	Local Currency Equivalent
	ITTO	**84,784.00**	
	COSTA VERDE	38,510.00 (in-kind)	
	TOTAL	**123,294.00**	

INDEX

INDEX OF FIGURES

INDEX OF TABLES

List of Abbreviations and Acronyms

CITES: Convention on International Trade in Endangered Species of Wild Fauna and Flora
CN: Concept Note
DSA: Dayli Sustainable Allowance
GFGs: Global Forest Goals
ITTO: International Tropical Timber Organization
ENBCC: National Forestry and Climate Change Strategy, Peru
INIE: National Institute of Statistics and Information, Peru
LSSC: Legal and Sustainable Supply Chains
MINAM: Ministry of Environment, Peru
NGO: Non-governmental organization
PNIFFS: National Plan for Forestry and Wildlife Research
PH: Index of acidity and alkaline of the soil and other organic materials
SDGs: Sustainable Development Goals
SERFOR: National Forestry and Wildlife Authority, Peru
UNALM: National Agrarian University- Lima Peru
UNFF: United Nations Forum on Forests

Map of Project Area

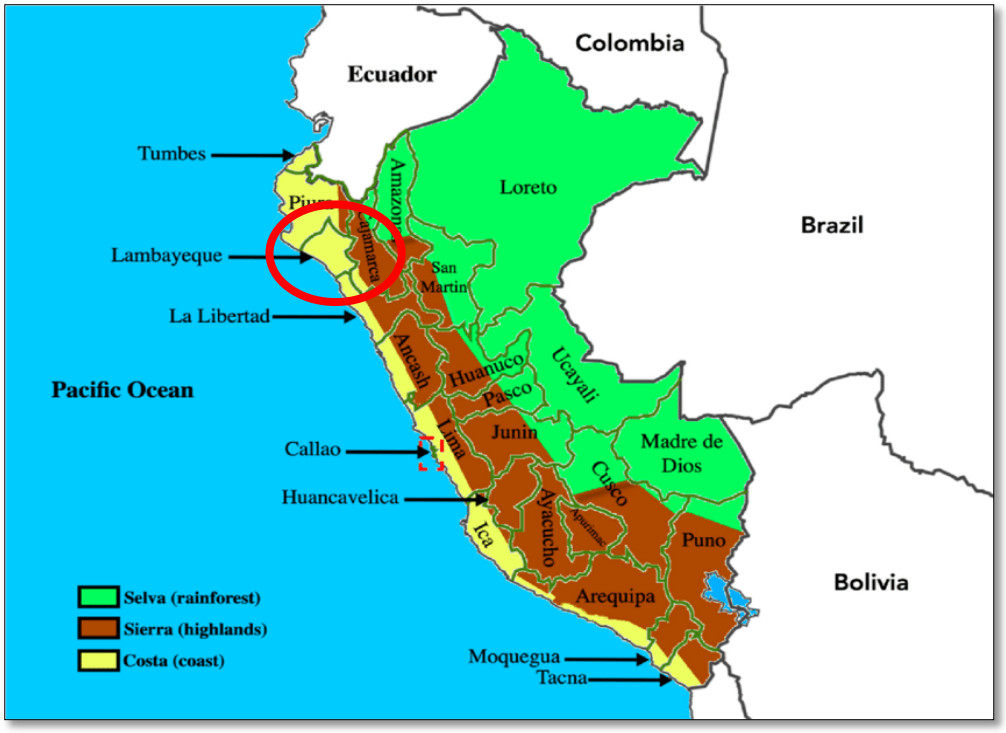


Figure 1. Map of project area

ART 1: PROJECT CONTEXT

1.1 Origin

This project proposal has originated on the need to make an assessment of the various and valuable experiences about plantations **of Caoba (*Swietenia macrophylla King*)** in the arid coastal region of Peru, out of its natural environment, which could provide excellent information for the propagation and silviculture of this specie, which could alleviate the pressure on the tropical Amazonian forest, where this specie grows naturally, Caoba is submitted to great pressure with the negative consequences about the degradation and decapitalization of the natural forest in its biodiversity, among a context of an illegal logging. This proposal is aligned with the outcome of two ITTO/CITES projects which evaluated the state of the natural regeneration of Caoba in the Amazonian region, and a strategy for assuring its conservation and repopulation. *Swietenia macrophylla´*s habitat is the tropical humid forest in Latin America, where annual precipitation is about 2,000 to 2,500 mm, submitted to a heavy and non-sustainable logging practices during several decades, up to extreme situation that now is listed in the CITES appendix 3, almost exhausted in the Peruvian Amazonian Forest.

Peru was the first exporter of this timber worldwide, and now is forced to import some volume of Caoba in order to cover the deficit for the local and international market. **Caoba is the most expensive wood, favored as a material for fine furniture and musical instruments. However, due to illegal logging, Caoba forests are rapidly disappearing. Illegal logging is also prevalent in national parks and indigenous reserves managed by the authorities. Most of the Caoba exported to the United States comes from illegally logged 90% of exports.**

In the case of young Caobas, it is difficult to plant trees for the purpose of economic or biodiversity conservation in their native areas because they are affected by Hypsipyla. This project is targeted at locations far from Hypsipyla risk. Hypsipyla grandella is a moth of the family Pyralidae. It is found in southern Florida (United States), most of the West Indies, Sinaloa and southward in Mexico, Central America, South America except Chile and in Mauritius. The larvae cause damage by feeding on new shoots of mahogany (Swietenia spp.) and cedro (also known as Spanish-cedar and tropical-cedar; Cedrela spp.). H. grandella feeds on the West Indies mahogany in southern Florida, which restricts the reproduction of the mahogany population.[2] The insects prefer a tree that gets full sun light and isn't being shaded by a canopy level. The larvae are often called mahogany shoot borers, but the name may differ by country.

The possibility to plant Caoba in the coastal region of Peru (department of Lambayeque,), opens a great perspective solving the problem of the loss of biodiversity in the Amazonian region while finding new opportunities for plantation, logging and transforming this wood in a region which is the most important demanding market and offering better facilities for industrial transformation and exporting.

This project proposal is supported by the National Forest Administration (SERFOR), the association of forest plantations in the northern coastal region of Peru, the regional Government of Lambayeque and several rural communities of this region as well as research and academic institutions.

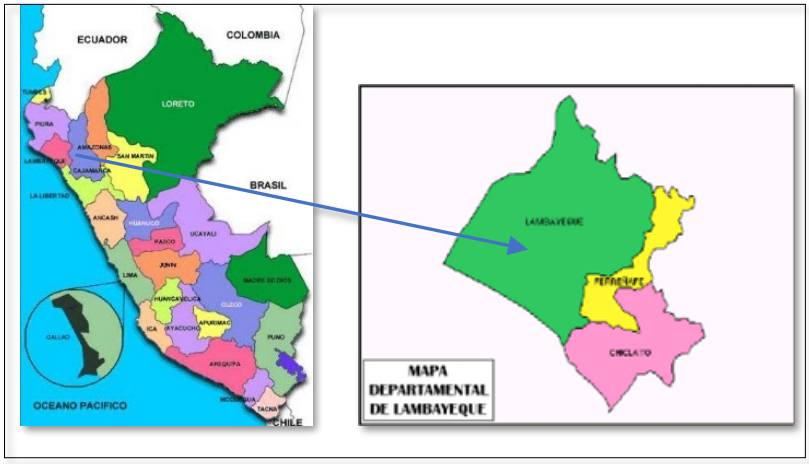


Figure 2. Map of Peru and the department of Lambayeque and Chiclayo

1.2 Relevance

1.2.1 Conformity with ITTO's objectives and priorities

This project proposal is in line with the main objectives and priorities of ITTO 's strategic priorities and crosscutting strategies, 2022–2026, as follows**:**

Strategic priority 3. Resilience, restoration and conservation; Reduce tropical deforestation and forest degradation, enhance forest landscape restoration and the resilience of forest ecosystems to climate change, and conserve forest biodiversity and ecosystem services.

Strategic priority 4. Statistics and information; Improve the quality, availability and timeliness of information on tropical forest product markets, supply chains and international trade, including challenges and opportunities related to market access, expansion and diversification.

1.2.2 Relevance to the Sustainable Development Goals (SDGs) and the Global Forest Goals (GFGs) and other forest related global agenda:

It is important to underline the importance and relevance of the project with the Sustainable Developing Goals (SDGs) 2030 of the UN: namely to the SDG 1, 12, 13 and 15

1. SDG 1 No poverty: it could help to alleviate the poverty among small farmers bringing to them a new and good alternative for the improvement of their lively hold, SDG 12: responsible production and consumption: this alternative concurs to the sustainable management of the natural resources, SDG 13: Climate action and SDG 15: Contributing to the alleviation and adaptation of the climate change: the ecosystems could be adapted to produce new resources in benefit of the population wellbeing SDG 15 Life on Land: Human life depends on the earth as much as the ocean for our sustenance and livelihoods. Plant life provides 80 percent of the human diet, and we rely on agriculture as an important economic resource. Forests cover 30 percent of the Earth's surface, provide vital habitats for millions of species, and important sources for clean air and water, as well as being crucial for combating climate change.

2. Global Forest Goals (UNFF): 1, 3, 4, 5 & 6 The resilient recovery from the COVID-19 pandemic along with responses to the climate and biodiversity crises must be rooted in the world's forests. Forests and forest-dependent people are both a casualty and an important part of the solution. Sustainably resourced and managed forests can bolster employment, disaster risk reduction, food security and social safety nets, for starters. Forest can also protect biodiversity and advance both climate mitigation and adaptation. About global health, safeguarding and restoring forests are among the environmental actions that can reduce the risk of future zoonotic disease outbreaks.

Related to the Climate change aspects, it is important to mention that the project has a linkage with the adaptation to the Climate Change, taken advantage of the potential of the northern arid zone for Caoba plantation, which represents a real alternative for the conservation of the Amazonian Forest... Mitigation is also an important issue, considering the potential reduction of biodiversity loss and control of the illegal logging.

1.2.3 Relevance to submitting country's policies:

The Peruvian State has declared of national importance the forestry and wildlife development translating it to the generation of well-being and development opportunities for the national population. Likewise, it affirms its respect for the environment and its willingness to maintain and increase the natural capital constituted by forest and wildlife resources. The National Forest and Wildlife Policy recognizes as strategic guidelines the promotion of research, innovation, training and technology transfer in forestry and wildlife fields. On the other hand, the current Forestry and Wild Fauna Law (29763) article 137, declares forest research of national interest.

Along these lines, SERFOR, the National Forest Authority in collaboration with different actors in the forestry sector and wildlife, has drawn up the National Plan for Forestry and Fauna Silvestre Research Plan (PNIFFS) as a strategic instrument to promote the adoption of scientific knowledge and technologies that respond to the needs of the forest and wildlife sector The National Strategy on Forests and Climate Change - ENBCC (Supreme Decree No. 007-2016-MINAM), a management document that will set the standards for the design and implementation of public policies, programs, projects, and actions in order to allow the country to reduce deforestation and forest degradation, seeking

innovative/smart alternatives for sustainable land use plan, restoration of degraded ecosystems, sustainable forest management stopping illegal logging and wood commerce.

Regarding the CITES and CBD conventions, Peru is strictly following all the norms and dispositions. In the case of Caoba, since Caoba was including in the appendix III of CITES, Peru is controlling very closely the logging and exports procedures, having established an annual logging quota, which is currently about 2,500 m3 (less thar the 10% of the cuts during the 80s and 90s decades). Also, Peru has developed 2 projects with ITTO/CITES aiming to evaluate the state of the natural regeneration of Caoba in the Amazonian region, and a strategy for assuring its conservation and repopulation.

1.2.4 Gender considerations

According to the country's policy gender consideration is always being considered, in this case Gender considerations will take into account for the implementation of the field activities, especially in nursery and reforestation activities. The proportion of women's participation in field activities during the project will be maintained above 40%.

1.3 Target area

The target area is the northern coastal region of Peru, particularly in the departments of Lambayeque, Piura and Tumbes, where a typical tropical dry forest ecosystem predominates, this region has an annual precipitation ranging between 150 to 350 mm/year and an annual temperature average of 22-23 degrees Celsius.

Lambayeque covers an area of 14,231 km2 (1.1 percent of the national territory), It is in the northwest of the country, between the Pacific Ocean (west) and the regions of Piura (north), Cajamarca (to the east) and La Libertad (to the south). Politically it is divided into 3 provinces, (**Chiclayo,** Lambayeque and Ferreñafe) and 38 districts, being Chiclayo the capital city. **The headquarters of the project will be based in Chiclayo.**

In 2020, (INIE 2020) the main economic activities according to their Gross Value Added were other services (S/ 4.98M), trade, maintenance and repair of motor vehicles and motorcycles (S/ 2.98M), manufacturing (S/ 1.65M), agriculture, livestock, hunting, and forestry (S/ 1.53M) and construction (S/ 1.52M).

The total population is about 1,320,000 inhabitants, with a population economical active of 700,000 out of which 96 are occupied.

- **Total poverty: 14%,**
- **Urban Population: 84%,**
- **Area of rural communities: 448,000.00 ha officially recognized, and other similar area in process of its recognizance**

Considering that the annual temperature of this region is similar to the Amazonia's one, where Caoba grows naturally, some private entrepreneurs take the initiative to establish some experimental small plantations using drip irrigation system obtaining, apparently, a good success that deserves to be observed and gathered in order to obtain the necessary information that allows to establish a good reference on the results and future prospects for new plantations of this valuable specie, with the additional advantage that apparently this region is free of *Hypsipyla* and also close to demand markets, industrial centers and seaports for the export.

These experiences, as pilot plantations, of Caoba have been established in the departments of Lambayeque, Piura and Tumbes in small plots in deforested areas or barren lands previous authorization of the national Forest Service.

The following figures show the areas where some plantations were identified, in the department of Lambayeque., capital Chiclayo.

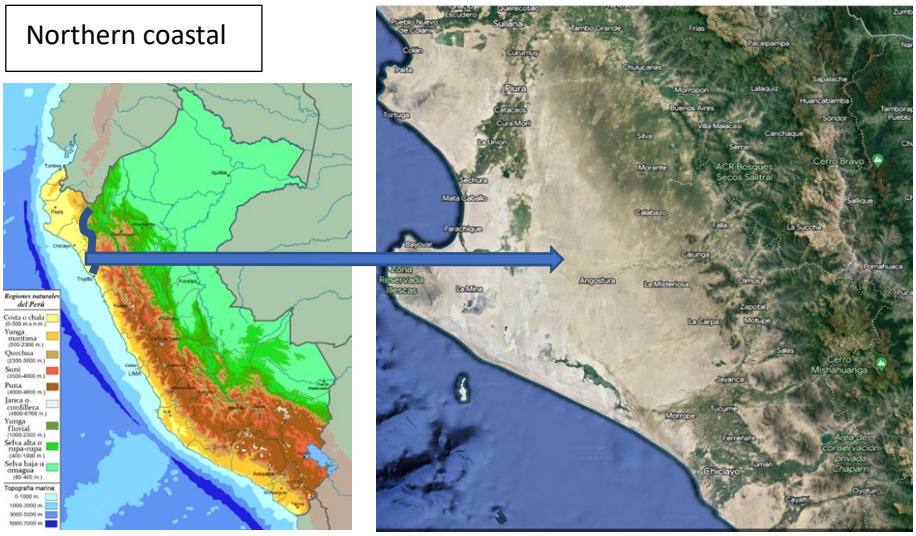


Figure 3. Map of target area and Caoba plantations Satellite imagen

The total area with Caoba plantation in this area is unknow yet in detail, but general estimations mention about 100 ha, however this information will be clarified providing accurate and detailed figures obtained through this project.

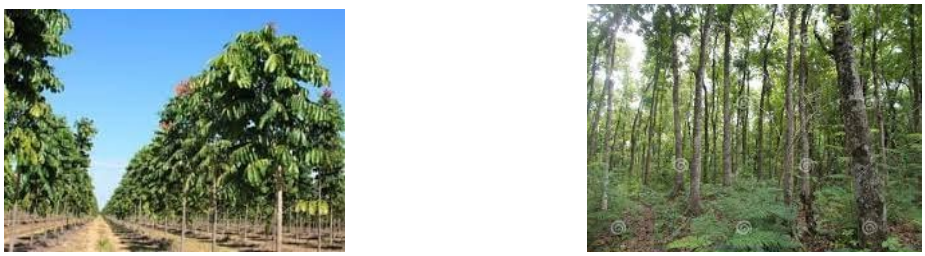


Figure 4. Caoba stands of 12 years planted in province of Olmos department of Chiclayo, northern coastal region of Peru (Photo Nils Perez, 2022)

1.4 The northern coastal region of Peru

The coastal region, predominantly arid and semi-arid, contains many of Peru's major cities and attractions including Lima (the capital of Peru), Chiclayo, Tumbes, Piura and Trujillo, and the famous Pan-American Highway (Carretera Panamericana). Bird and marine life are abundant in this region; where can see colonies of sea lions sunbathing, Peruvian pelicans looking for fresh fish, Chilean flamingos, Humboldt penguins, Inca Terns, and the Brown Booby.

Peru's coast is a bleak, often rocky, and mountainous desert that runs from Chile to Ecuador, punctuated by fifty-two small rivers that descend through steep, arid mountains and empty into the Pacific. The Costa is a strange land of great dunes and rolling expanses of barren land, at once a desert but with periods of humidity as high as 90 percent in the winter from June to September, when temperatures average about 20 degrees Celsius. Temperatures along the coast rise near the equator in the north, where the summer can be blazingly hot, and fall to cooler levels in the south. If climatic conditions are right, there can be a sudden burst of delicate plant life at certain places. Made possible by the heavy mist. However, mist is only sufficient to dampen the air, permitting its condensation in some specific areas, called "Lomas" (an unique ecosystem, where some low dense vegetations grows) . These conditions greatly favor the preservation of delicate archaeological remains. The environment also facilitates human habitation and housing because the climate is benign, and the lack of rain eases the need for water-tight roofing.

Besides, the above description of the desertic areas the northern coastal region is also know for the presence of the the *Equatorial-Pacific Seasonally Dry Forests* of north-west Peru (also known as the Tumbesian region) are amongst the most unique and biodiverse forests on earth. These deciduous, tropical forest habitats have evolved in isolation, in a relatively constant climate, maintained by the cold Humboldt marine current.

The area is isolated by the Pacific to the west, the Andes to the east, the wet forests of the *Chocó* to the north and the Peruvian Coastal desert to the south. The constant climate and isolation have led to the evolution of many species unique to the region.

The isolation of this region from the zones of influence of Hipsipyla grandella zell is one the of the comparative advantage of the northern coastal with the Amazonian region, moreover, the caoba planters obtained good results with insects control planting certain agricultural crops attractive to insects, near the Caoba plantations.

Figure 5. Views of the typical landscapes of the semi-arid region of the northern coast

The original coverage of the dry forests has been decimated through the past five centuries, with the rate having accelerated owing to road building programs in the last half century. Now only approximately 40% of the original forest cover remains in good condition.

El Niño-Southern Oscillation has been treated as a disruptor of environmental and socioeconomic equilibrium both in ancient times and in modern-day Peru. Recent work in the coastal desert plain, known as the Pampa de Mocan, challenges this view by demonstrating that pre-hispanic irrigation systems were designed to incorporate floods and convert them into productive waters. In sharp contrast to modern-day flood mitigation efforts, ancient farmers used floodwaters to develop otherwise marginal landscapes, which in turn mitigated risk during El Niño years. These archaeological data speak to contemporary policy debates in the face of increasingly intense and frequent natural disasters.

Figure 6. Partial view of Pampa de Mocan

1.5 Experiences with Caoba plantations

Planting and cropping Caoba is, since several decades ago, a real challenge full of discouraging experiences, except some punctual experiences in small areas, which doesn´t give important hopes for its replication at the economic scale in the humid tropical forest. This is namely due to the practically impossible control the attack of the *Hypsipyla grandella* Zeller, called the “meliaceae borer” insect which affects almost the 100% of young plants, within or out of the forest, in spite of the enormous efforts deployed for its control (biological, mechanical, genetic).

The other elements which make it so difficult to reproduce Caoba is to find a favorable habitat other to which it grows naturally, i.e soil texture, PH, humidity, annual temperature etc. However, these factors can be accommodated without too much problems, meant that soil condition could be managed to get the appropriated conditions, humidity that nowadays could be solved using dropping irrigation or simply providing the adequate volume of water to the plantation. The advantage of the northern coast is the average annual temperature, which in very similar to the Caoba natural environment, around 21 to 25 C degrees.

Mahogany (Caoba) has long been considered the most valuable wood in the world. Now the mahogany is in danger of extinction. Therefore, mahogany should no longer be purchased when it proceeds from de zones with deforestation problems. In fact, the US Federal Agency for the Conservation of Nature even prohibited or

seriously limited importation. However, there are still imports of timber from illegal logging, in consequence planting Caoba ex-situ could be one of the smarts solutions to illegal logging and control of Hipsipyla attacks.

An excellent example of successful plantation of Caoba out of its natural environment is Fiji where approximately 55,000 hectares of plantations of the valuable species *Swietenia macrophylla* (mahogany) and there are plans to continue expanding this area. Harvesting began in 2003. The management and marketing of the mahogany resource will have an influence on the future success of the Fijian timber industry. Temperatures vary according to the season: from June to October, which is the dry season, they are 16 °C, while in the rainy season (December to April), they can reach up to 32 °C; while that of the sea is usually around 30 °C. Precipitation decreases from east to west: in the east rainfall reaches about 3000 mm., while in the west it is only of 1800 mm. Other important undertaking experiences had been implemented in Java -Indonesia with promising results.

Some private entrepreneurs in Peru were inspired on these experiences and have taken the initiative to plant this specie in the northern coast of Peru, with and apparent good success.

Several attempts of plantations of Caoba in the Amazonian region in Peru, as well as the tropical rain forest in Latin America have failed due to the extreme difficulties of its silvicultural management and the attack of *Hipsipyla*, which consequences are the early branching of the stem of the trees with the serious loss of the its commercial value, discouraging many operators of the private sector to continue with their experiences , shifting to other native and exotic species with less difficulties, but at the same time the logging practices of Caoba continues, reducing constantly the natural stock of this specie, draining the biodiversity of the tropical forest.

The tentative area for future plantations of Caoba in the northers coastal, have been estimated as follows.

Sectors	Reforestation and Restoration	Hectares
San Cristóbal Grande	**Restoration (planting and Protection of RRNN)**	**625.00**
	Reforestation with assisted irrigation	**150.00**
Querpón	**Restoration (planting and Protection of RRNN)**	**1,450.00**
	Reforestation with assisted irrigation	**250.00**
TOTAL	**Restoration (planting and Protection of RRNN)**	**2,475.00**

Table 1. The tentative area for future plantations of Caoba

Figure 7. Young plant of Caoba attacked by Hipsipyla in the Amazonian region

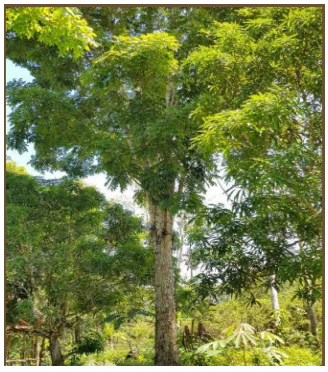


Figure 8. Caoba tree with heavy branching at 3-5 meter high, after being attacked by the insect

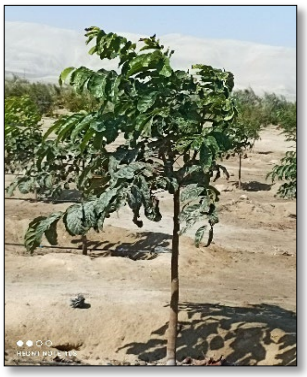


Figure 9. Two years old plant of caoba in the arid zone

On the other hand, the public service doesn´t dispose enough resources to monitor these experiences both in the tropical rain forest and the dry forest regions, and the current incentives are insufficient to encourage the community and private sector to invest in new plantations.

1.6 Outcomes at project completion

Upon completion of the project, an integrated report on Caoba plantation and use will be published. This will cover the environmental and economic factors required for ex-situ conservation and plantation of Caoba in the norther coastal region of Peru.

And the report will be distributed to stakeholders like government agencies, NGOs and other stakeholder so that the information obtained through this project can be used to refine restoration manuals and implementation guidelines for endangered species on the northern coast of Peru.

This could permit them to have a clearer scenario related with the perspectives of planting Caoba in the semi-arid region, instead of doing that in the Amazonian region, where the growing conditions make it extremely difficult, avoiding at the same time unsustainable and illegal practices of logging.

And this will also serve as an opportunity to expand investment in the preservation and utilization of Caoba by the government or the private sector, and in the long term, it will play an important role in creating a foundation for the ex-situ conservation and utilization of Caoba, especially its economic use.

PART 2: PROJECT RATIONALE AND OBJECTIVES

2.1 Stakeholders analysis

The project will improve their information and assessment tools for the identification of the conditions and location of experiences in reforestation in the northern coastal region of Peru, in this context, local governments and rural communities will also be an important part of this target beneficiary group. The direct beneficiaries of the project will be small-scale farmers and, in general, low-income rural dwellers living in the project's direct area of influence, as well as small and medium entrepreneurs in the forestry and agricultural sectors.

The participation of the different stakeholders will be as follows:

i) The private sector, entrepreneurs, who have taken the initiative of establishing experimental plantations in this part of Peru, for 12 years ago, obtaining important and encouraging results, that deserves to be asset in order to obtain more and detailed information of their experiences.

It is foreseen to visit and interview all the entrepreneurs, doing a complete survey of their experiences in the field, collecting data about the area, soil conditions, irrigation, provenance of seeds and seedlings used for the plantations, trying to reconstruct the timeline with all the details in each case, They will be requested to collaborated, is possible with a whiten report of their expediencies during the technical meetings and workshops.

Beside to the experiences with Caoba plantation it is also previewed to collect information about experiences of plantations with other species natives aiming to compare the results and lessons learned, particularly from the perspective of its contributions to the biodiversity aspects and the livelihood of the local, population.

ii) The communities and small farmers who are interested and participate in some initiatives of reforestation in the semi-arid will also be considered as important stakeholders considering that they own more than 70% of the land in this region.

Interviews and visits in the field will be programed with them, as well as some surveys to collect information of their interest, experiences and land availability for reforestation and forest ecosystems conservation. Identification of leadership and their potential participation in an ample program for reforestation and restoration. If possible, they will be asked for a written report on their experiences.

iii) The public sector, including the forest and environmental institutions, local authorities are considered important actors for official and trustable information about initiatives, promotion and developing of reforestation and restoration. Their participation in the surveys providing logistical and operational support will be a key part of the success of the data collection and its systematization.

iv) The NGOs working in the area of influence of the project, will be contacted aiming to obtain their views and experiences in forest plantations and related issues.

v) The academy (Universities and research institutions) will be extremely important in the analysis of the information, technical and scientific elements that will be necessary to take into account. Their participation in the workshops and technical meetings will be assured. One of the most important collaborating institutions in this project will be the Department of Forest Management of the National Agrarian University (UNALM), as well as other research institutions as: University of Pedro Ruiz Gallo (Lambayeque) and the Peruvian Amazon Research Institute (IIAP).

2.2 Problem analysis

The key problem is that Caoba is becoming extinct in the tropical rain forest, which is its native region, and as an alternative, there is a possibility of conservation and economic utilization through plantation in the Peruvian coastal region, which is semi-arid area, but there is a lack of information necessary for plantation in this semi-arid region.

This makes it difficult to attract the attention and investment of governments and corporations for the conservation and economic utilization of endangered high-value species such as Caoba.

During the last two decades some interesting but incomplete information has circulated about the initiatives of certain private entrepreneurs and the civil society installing small plots of *Swietenia macrophylla* in the arid and semi-arid conditions of the northern coastal region of Peru, nevertheless this information was not taken seriously in consideration by the public sector until the recent years when after visiting some of these stands were collected important evidences about their existence and potential success, however this information is still far a way to be complete and detailed, in consequence a well-organized plan and project for the formal gathering and assessment of these data is necessary in order to come out with a serious and credible report about the actual situation of these experiences.

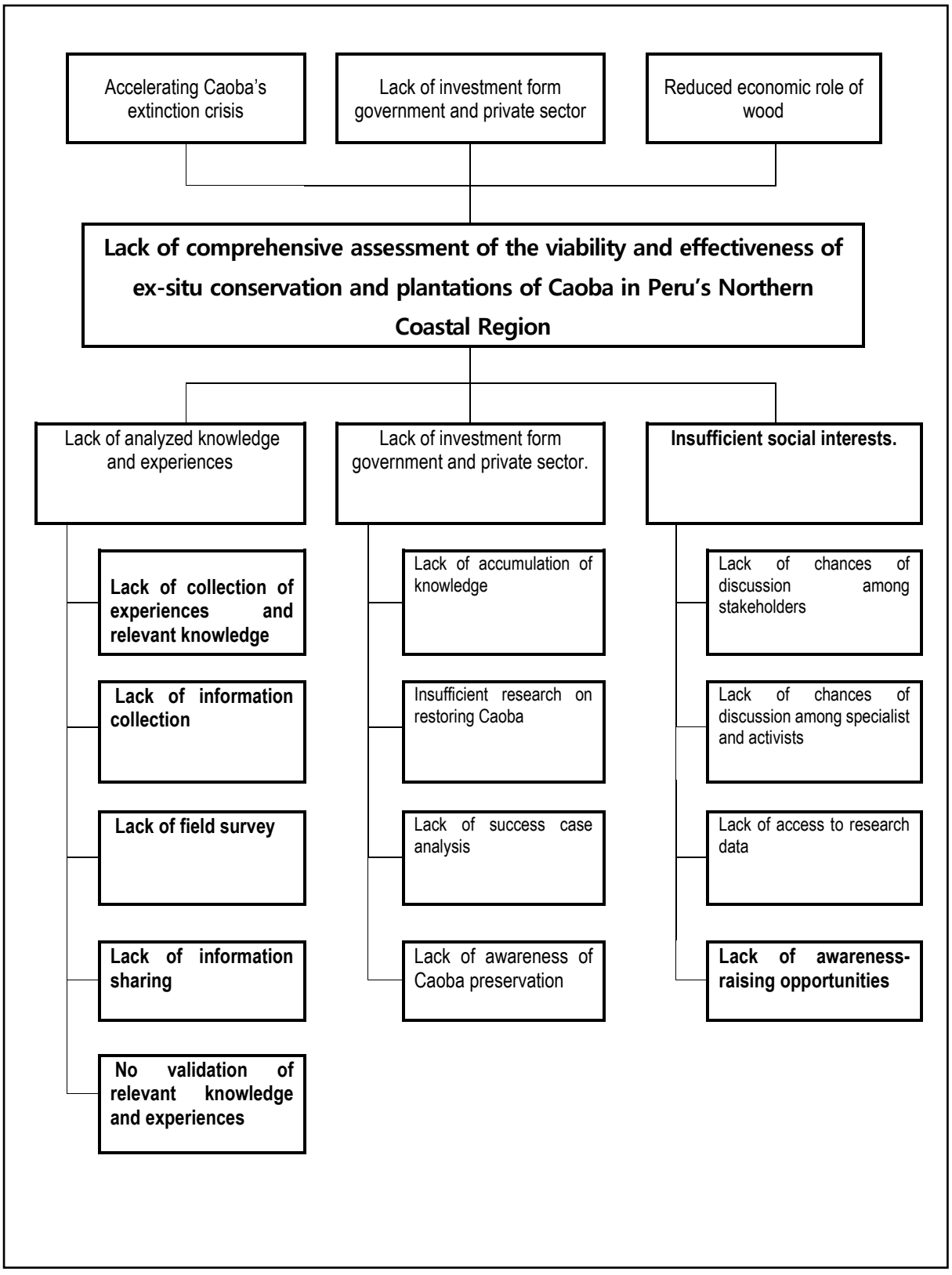
The lack of a well-organized yet, of an integrated forest research plan of the State promoting innovative solutions to stop deforestation and forest degradation in the amazon and the semi-arid regions is one of the problems that should be tackled, aiming to initiate a basic research plan of data collection and systematization regarding the opportunities potentialities of different strategies to halt deforestation in of the natural forest and seeking alternatives promoting the private sector investments, recovering huge areas of barren lands for reforestation, alleviating the height pressure of forest logging and deforestation in the Amazonian region: that could be done profiting of the new technologies for planting, propagation, irrigation and soil improvements also contributing to the adaptation of the climate change, opening new income generating alternatives for the improvement of the livelihoods of the local population.

The project will provide concrete and consistent data about socioeconomic and environmental aspects which will permit the entrepreneurs to have more reliable information that could permit them to take a quick decision in the context of this new opportunity, implementing good quality and efficient forestry and agroforestry investments, supported by technical and financial assistance particularly to the small forest operators.

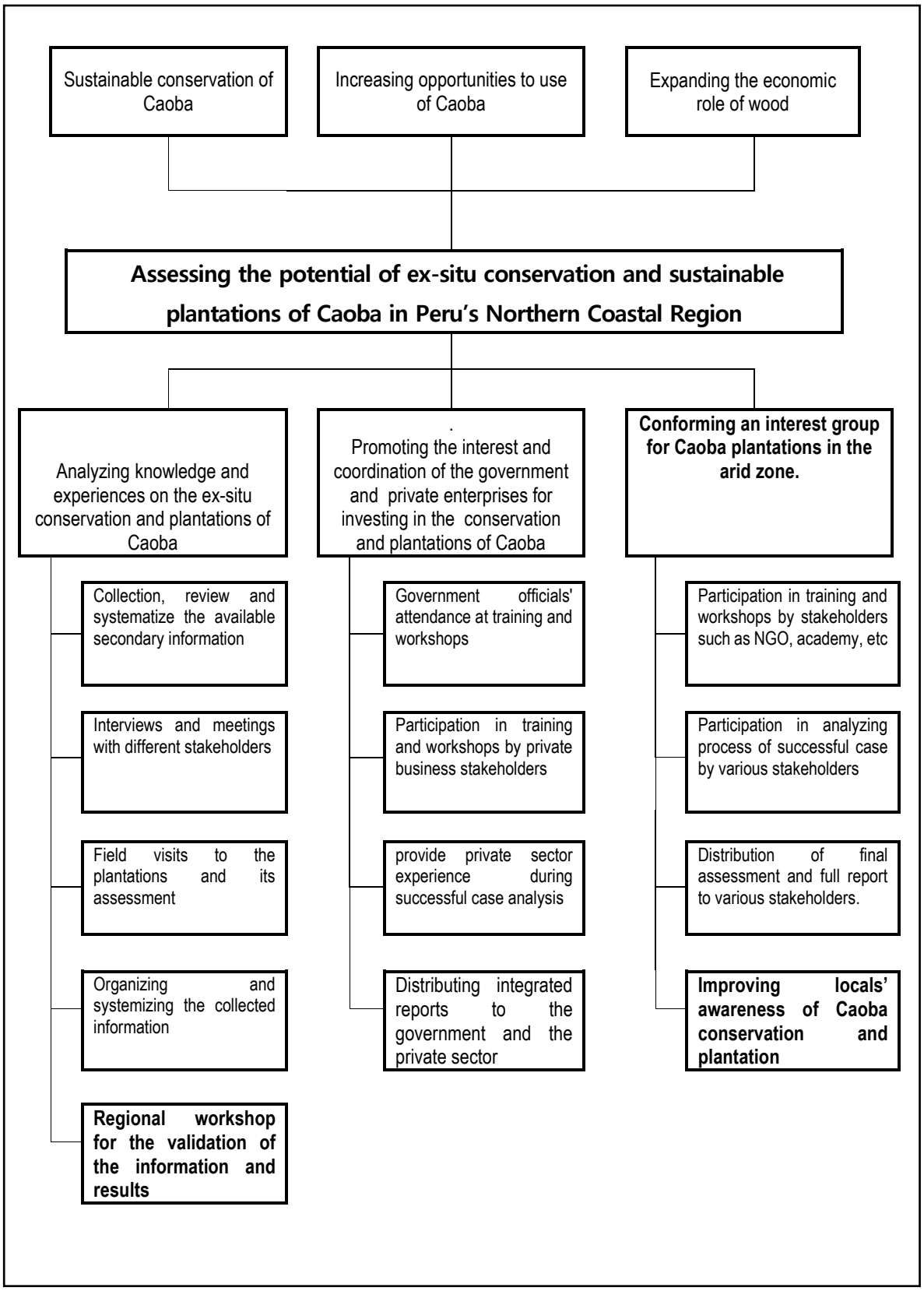
The result, as expected, will be clear evidence/proof that even in the most challenging scenario it is always possible to find adequate and viable solutions and opportunities for the forest sector. The application of the new forest plantation opportunities will be largely justified and compensated for by the environmental and socioeconomic benefits, in the short, mid and long term.

2.3 Problem and solutions trees

< Figure 10. Problem tree>



< Figure 11. Solutions tree>



2.4 Objectives

2.4.1 The development objective and impact indicator

The development objective is to promote the conservation and sustainable use of endangered Caoba in the Northern coastal area of Peru.

Impact indicator

1.1 Adoption of policies supporting the establishment and management of Caoba plantations, ensuring ecological sustainability and social benefits.

1.2 Growth in the number of local communities, smallholders and private enterprises engaged in establishing and managing Caoba plantations.

2.4.2 The specific objective and impact indicator

The specific objective is to conduct a comprehensive analysis of successful experiences and valuable lessons learned from ex-situ conservation and plantations of Caoba in the northern coastal area of Peru.

Impact indicator

2.1 By the end of the project, at least 4 workshops will be organized for validation successful restoration experiences with attendance of 45-50 participants in each workshop.

2.2 By the end of this project, at least 1 interest group will be organized for Caoba plantation in the arid area, with around 2,475ha of plantations.

PART 3 DESCRIPTION OF PROJECT INTERVENTIONS

3.1 Outputs

The outputs of this small project will be:

(Output 1) Analyzing knowledge and experiences on the ex-situ conservation and plantations of Caoba

1.1 Collection, review and systematize the available secondary information.

1.2 Interviews and technical meetings with different stakeholders

1.3 Field visits to the plantations and its assessment

1.4 Organizing and systemizing the collected information.

- **Factors will be including, provenance, seedlings production, soil and water conditions, plagues, growing rates, silvicultural treatments, forest insects like 'Hipsipyla grandella zell', etc.**

1.5 **Regional workshop (2) for the validation of the information and results.; expected 45-50 participants**.

(Output 2) Promoting the interest and coordination of the government and private enterprises for investing in the conservation and plantations of Caoba, both in the arid zones and the Amazonia's regions

2.1 Government officials will attend training and workshops.: **at least 2 workshops, one for the identification of the promising experiences in Caoba plantation one for the identification of potential areas and interest groups**.

2.2 Private businesses will attend training and workshops**. One technical workshop on experiences and successful reforestation methods of Caoba plantation in the arid zone**

2.3 Private businesses will share their experience and ideas of the business environment.; **one Technical meeting.**

2.4 The final report will be distributed to the government and private sector.

(Output 3) Organizing an interest group for Caoba plantations in the arid zone (tentatively selected 2,475ha)

3.1 Participation of various stakeholders such as NGO, activists, locals, academy, etc.

3.2 Stakeholders will continue to participate in the project implementation and analyzing process, including workshops, briefings, and data collection.

3.3 Final reports will be distributed to various stakeholders.

3.4 Improving locals' awareness of Caoba conservation and plantation.

3.2 Activities and inputs

The study will be conducted by a lead consultant team, through the filed visits and interviews, organization of consultations, technical conferences and workshops involving the academy, SERFOR and other relevant actors and stakeholders:

1) Preparation of terms of reference for the study, including the expected deliverables, working plan, election and contracting of the consulting team
2) Review of relevant documents/reports and published literature.
3) Visit and evaluation of field experiences planting Caoba and other tropical forest species in the southern and northern coastal regions of Peru.
4) Interviews, ad hoc consultations and at least two technical conferences with key source persons/experts
5) Cost calculation of the different activities and components of Caoba plantations.

The following actions will be focused on achieving each output.

< Table 2. Matrix of objective, outputs and activities is the following>

SPECIFIC OBJECTIVE:	OUTPUTS	ACTIVITIES	INPUTS
Conducting a comprehensive analysis of successful experiences and valuable lessons learned from ex-situ conservation and plantations of Caoba in the northern coastal area of Peru	1. Analyzing knowledge and experiences on the ex-situ conservation and plantations of Caoba	1.1 Collection, review and systematize the available secondary information. 1.2 Interviews and technical meetings with different stakeholders 1.3 Field visits to the plantations and its assessment 1.4 Organizing and systemizing the collected information. 1.5 Regional workshop (2) for the validation of the information and results	At least 2 workshops, 45-50 participants
	2. Promoting the interest and coordination of the government and private enterprises for investing in the conservation and plantations of Caoba, both in the arid zones and the Amazonia's regions	2.1 Government officials will attend training and workshops. 2.2 Private businesses will attend training and workshops. 2.3 Private businesses will share their experience and ideas of the business environment. 2.4 The final report will be distributed to the government and private sector	At least 2 workshops and 1 technical workshop

SPECIFIC OBJECTIVE:	OUTPUTS	ACTIVITIES	INPUTS
	3. Organizing an interest group for Caoba plantations in the arid zone (tentatively selected 2,475ha)	3.1 Participation of various stakeholders such as NGO, activists, locals, academy, etc 3.2 Stakeholders will continue to participate in the project implementation and analyzing process. 3.3 Final reports will be distributed to various stakeholders. **3.4 Improving locals' awareness of Caoba conservation and plantation**	Including workshops, briefings, and data collection

3.3 Strategic approach and methods

The purpose of this project is to collect information necessary for successful afforestation of Caoba trees in semi-arid areas by analyzing successful cases. To this end, the following strategies and methods will be established and promoted.

First, it is necessary to prepare a proper survey format. Formats will be created to collect the maximum amount of information necessary for afforestation and growth of Caoba trees. For this purpose, relevant experts will have sufficient discussions.

Second, it is to ensure that the different information provided by different plantations can be managed in an integrated manner. Many conversations with the owner of the plantation or activists will be helpful to understand the right meaning of differently presented information.

Third, the focus will be on the availability of information. This project will prioritize the information available for actual afforestation, as it will collect and systematize information useful for future planting of Caoba trees in semi-arid areas.

Fourth, by engaging various stakeholders, it will raise interest in preserving ex-situ in semi-arid areas of the Caoba tree. In addition, presenting various opinions from the various stakeholders will help improve the quality of the project.

Five, during the process of the project, where possible, information related to the conservation of native species other than Caoba will also be collected. This could also be helpful for other projects for biodiversity conservation in the future.

Sixth, during the process of the project, various opportunities for participation will be created to increase the interest of government, business and stakeholders. This will play a positive role in expanding investment in ex situ conservation and afforestation in the future.

The goal of this project is not to make a successful case by reforestation in the actual site, but to make a report by finding the conditions for success by reforestation of cacao in the project area. However, in order for these achievements to expand cacao plantation in the future, and to increase the conservation of endangered species and economic effects through this, it is necessary to increase the publicity effect of this project as much as possible. Therefore, efforts will be made to raise interest, such as participation of stakeholders, in the course of the project.

3.4 Work plan

Output/ activities	Responsible Party	Year 1											
		1	2	3	4	5	6	7	8	9	10	11	12
Outputs 1	Analyzing knowledge and experiences on the ex-situ conservation and plantations of Caoba												
1.1 Collection, review and systematize the available secondary information	EA COSTA VERDE STAFF AND CONSULTANTS												
1.2 Interviews and technical meetings with different stakeholders	EA COSTA VERDE STAFF AND CONSULTANTS												
1.3 Field visits to the plantations and its assessment	EA COSTA VERDE STAFF AND CONSULTANTS												
1.4 Organizing and systemizing the collected information	EA COSTA VERDE STAFF AND CONSULTANTS												
1.5 Regional workshop (2) for the validation of the information and results	EA COSTA VERDE STAFF AND CONSULTANTS												
Outputs 2	Promoting the interest and coordination of the government and private enterprises for investing in the conservation and plantations of Caoba, both in the arid zones and the Amazonia's regions												
2.1 Government officials will attend training and workshops	EA COSTA VERDE STAFF AND CONSULTANTS												
2.2 Private businesses will attend training and workshops	EA COSTA VERDE STAFF AND CONSULTANTS												
2.3 Private businesses will share their experience and ideas of the business environment	EA COSTA VERDE STAFF AND CONSULTANTS												
2.4 The final report will be distributed to the government and private sector	EA COSTA VERDE STAFF AND CONSULTANTS												
Outputs 3	**Organizing an interest group for Caoba plantations in the arid zone (tentatively selected 2,475ha)**												
3.1 Participation of various stakeholders such as NGO, activists, locals, academy, etc	EA COSTA VERDE STAFF AND CONSULTANTS												
3.2 Stakeholders will continue to participate in the project implementation and analyzing process	EA COSTA VERDE STAFF AND CONSULTANTS												
3.3 Final reports will be distributed to various stakeholders	EA COSTA VERDE STAFF AND CONSULTANTS												
3.4 Improving locals' awareness of Caoba conservation and plantation	EA COSTA VERDE STAFF AND CONSULTANTS												

According to the working plan activities 1.2 and 1.3 are in the adequate timing

3.5 Master budget by Activities

Category	Unit	Local consultants	Thecnical assistants	DSA	Travel air freight	Travel, surface	Workshops	Equipment	Stationary	TOTAL
GENERAL EXPENSES BUDGET										
Project Coordinador/director	30,000.00									30,000.00
Accounting	6,000.00									6,000.00
Financial Audit Costs	4,000.00									4,000.00
ITTO-Administration and monitoring costs	4,500.00									4,500.00
ITTO – program support (12% of the budget)	9,084.00									9,084.00
EA administration costs	14,310.00									14,310.00
Sub Total (general expenses)	**67,894.00**									**67,894.00**
ACTIVITIES BUDGET										
1. Analyzing knowledge and experiences on the ex-situ conservation and plantations of Caoba		**9,000.00**	**4,500.00**	**7,200.00**	**1,800.00**	**1,120.00**	**2,800.00**	**2,500.00**		**28,920.00**
1.1 Collection, review and systematize the available secondary information		1,500.00	750.00	1,200.00	400.00	210.00		2,500.00		6,560.00
1.2 Interviews and technical meetings with different stakeholders		1,500.00	750.00	1,200.00	400.00	210.00				4,060.00
1.3 Field visits to the plantations and its assessment		3,000.00	1,500.00	2,400.00	600.00	350.00				7,850.00
1.4 Organizing and systemizing the collected information		1,500.00	750.00							2,250.00
1.5 Regional workshop (2) for the validation of the information and results.; expected 45-50 participants		1,500.00	750.00	2,400.00	400.00	350.00	2,800.00			8,200.00

Category	Unit	Local consultants	Thecnical assistants	DSA	Travel air freight	Travel, surface	Workshops	Equipment	Stationary	TOTAL
2. Promoting the interest and coordination of the government and private enterprises for investing in the conservation and plantations of Caoba, both in the arid zones and the Amazonia's regions		**3,750.00**		**600.00**	**1,000.00**	**630.00**	**2,800.00**		**1,000.00**	**9,780.00**
2.1 Government officials will attend training and workshops		750.00		600.00	1,000.00	280.00	2,800.00			5,430.00
2.2 Private businesses will attend training and workshops										0.00
2.3 Private businesses will share their experience and ideas of the business environment.		3,000.00								3,000.00
2.4 The final report will be distributed to the government and private sector						350.00			1,000.00	1,350.00
3. Organizing an interest group for Caoba plantations in the arid zone (tentatively selected 2,475ha)		**5,250.00**	**1,500.00**	**4,200.00**	**800.00**	**350.00**	**4,600.00**			**16,700.00**
3.1 Participation of various stakeholders such as NGO, activists, locals, academy, etc		1,500.00	750.00	2,400.00	800.00	350.00	4,600.00			10,400.00
3.2 Stakeholders will continue to participate in the project implementation and analyzing process		1,500.00	750.00	1,200.00						3,450.00
3.3 Final reports will be distributed to various stakeholders				600.00						600.00
3.4 Improving locals' awareness of Caoba conservation and plantation		2,250.00								2,250.00
Sub Total (activities)		**18,000.00**	**6,000.00**	**12,000.00**	**3,600.00**	**2,100.00**	**10,200.00**	**2,500.00**	**1,000.00**	**55,400.00**
Total	**67,894.00**	**18,000.00**	**6,000.00**	**12,000.00**	**3,600.00**	**2,100.00**	**10,200.00**	**2,500.00**	**1,000.00**	**123,294.00**

3.6 Budget by Components

Category	Description	B	C	D	E	ITTO	EXECUTING AGENCY
		Units	Amount	Unit Cost	TOTAL		
11.1	Project Coordinador/director	month	12	2,500.00	30,000.00	25,000.00	5,000.00
11.2	Accounting	**month**	12	500	6,000.00	-	6,000.00
11.4	Local consultants	**month**	6	3,000.00	18,000.00	15,000.00	3,000.00
12.1	Technical assistants	**month**	8	750	6,000.00	5,500.00	500.00
SUBTOTAL					**60,000.00**	**45,500.00**	**14,500.00**
15.1	Workshop 1 1:Identification of actors and sites of plantations	unit	1	2,800.00	2,800.00	2,800.00	-
15.2	Workshop 2 : Data base construction	unit	1	2,800.00	2,800.00	2,800.00	-
15.3	Workshop 3: regional: validation of results	unit	1	4,600.00	4,600.00	3,600.00	1,000.00
SUBTOTAL					**10,200.00**	**9,200.00**	**1,000.00**
31.1	DSA	day	120	100	12,000.00	9,500.00	2,500.00
33.1	Local travel: air freigth	unit	18	200	3,600.00	3,000.00	600
33.2	Local travel; Surface	unit	30	70	2,100.00	-	2,100.00
SUBTOTAL					**17,700.00**	**12,500.00**	**5,200.00**
44.1	Computing equipment				2,500.00		2,500.00
44.2	Stationary	unit			1,000.00	-	1,000.00
SUBTOTAL					**3,500.00**	**0.00**	**3,500.00**
62	Financial Audit Costs	unit	4,000.00	1	4,000.00	4,000.00	-
SUBTOTAL					**4,000.00**	**4,000.00**	
SUB TOTAL (Activities)					**95,400.00**	**71,200.00**	**24,200.00**
81	**CONTROL AND REVIEW OF THE PROJECT (participation of ITTO Staff in one SC meeting)**				**4,500.00**	**4,500.00**	**-**
82	ITTO Program support cost (12% of the ITTO´s budget)				9,084.00	9,084.00	
83	Administration costs of EA (15% of the total budget)				14,310.00		14,310.00
SUBTOTAL (Administración and monitoring)					**27,894.00**	**13,584.00**	**14,310.00**
100	**TOTAL BUDGET OF THE PROJECT**				**123,294.00**	**84,784.00**	**38,510.00**

BUDGET LINE 81: according to the ITTO manual OF PROJECTS ELABORATION: CONTROL AND REVIEW OF THE PROJECT: this budget item covers the costs of visits by the Secretariat ITTO to attend project steering committee meetings. The project manager**. Thus, it could be a lump sum covering one trip of ITTO staff to participate in one steering committee meeting of the ITTO Secretariat will normally carry out at least one monitoring visit per year.**

PART 4 IMPLEMENTATION ARRANGEMENTS

4.1 Executing agency and organizational structure.

Project management will be under the responsibility of the NGO Costa Verde Initiative 20x20, a highly reputable institution at the national and international levels, and the Project Coordinator will be responsible for the technical implementation of the project.

This organization have more than 15 years of experience working in the Peruvian semi-arid region, dealing with several and different project activities in the field, like the evaluation of the stocks and biodiversity of the dry forest, reforestation and agroforestry in this region, executing several projects with ITTO´ financing support, as well as the Ministry of Agriculture and irrigation, the APFNet, (Asia pacific Forestry Network) IPSI (International partnership of Satoyama Initiative) and other national and international organizations

The main objective of Costa Verde is to promote the conservation, restauration and recuperation of the biodiversity in degraded ecosystems and barren land in the semi-arid region of Peru.

Technical Committee

The project technical committee will be the highest authority in the project policy and administration structure and will be made up of one representative from ITTO, a SERFOR (MIDAGRI) representative, a representative of the executing agency (Costa Verde), a representative of the Regional Government of Lambayeque.

The committee will meet twice a year to assess project progress and provide guidance to improve project execution and a second time at the end of the project. The technical committee will be the highest authority in the technical execution of the project, and it will be responsible for supervising, evaluating, proposing improvements or solutions, and making decisions on project implementation. This committee will also be in charge of preparing all technical and financial reports, managing project personnel, and other duties or activities as required.

4.2 Monitoring, reporting and evaluation.

Project progress and completion reports

At the beginning of the project, the coordinator will prepare an inception report to be submitted to ITTO and the Technical Committee and will also submit a detailed progress report and associated financial statement as required by the rules and procedures applying to ITTO projects. A project completion report and final financial audit report will be submitted within 3 months and 4 months after the end of the 12-month implementation period respectively.

4.3 Risks

To avoid any risk in areas where there are certain risks of epidemic or COVID-19 restrictions [or measures], the desk-research and interviews will partially be conducted virtually with reasonable travel at key locations in the country. Contacts between the consultants and relevant stakeholders will be facilitated and coordinated through existing linkages with administrative bodies in the selected areas and other groups recommended by the actors involved in the project implementation.

In general, the project does not pose any significant risks from a social, economic, or environmental viewpoint. On the contrary, an initiative such as this will open the door to important alternatives for the restoration and rehabilitation of very degraded ecosystems, which would otherwise be irreversibly lost. In this sense, the project can only provide multiple benefits. However, the project should take serious consideration in the evaluation of the areas planted or suitable for reforestation that must not enter in conflict with the natural existing ecosystems, particularly the dry forest formations with an important presence of value native species.

There is always a potential problem with extreme droughts that could affect the region, but this problem could be reversed by providing good and enough water reservoirs for drip irrigation. The other problem could be the insect attack, but its control is an important element of the strategy for the Caoba propagation.

The other risk is that the illegal logging in the Amazonian region persist despite the ex-situ plantations of Caoba, however the project aims to work together with the governmental organizations to tackle this problem promoting better conditions of Caoba timber supply in the norther's coastal region.

4.4 Sustainability

Project sustainability is guaranteed by the fact that the government has undertaken the commitment to promote and develop degraded land restoration programs throughout the country, as set out in the international agreement that framed Initiative 20x20. Furthermore, the project outputs i.e. the technological package and the SFM and land rehabilitation guidelines will be policy tools ready to be applied in the field, although they may be subject to future revisions and/or improvements to keep them up to date. Thus, the full model to be developed will be kept current, which will ensure project sustainability. All of this is based on the assumption that subsequent government administrations will continue to give the same or even more importance and political support to the rehabilitation of degraded lands and reforestation in the coastal region of Peru.

ANNEXES

ANNEX 1: PROFILE OF THE EXECUTING AGENCY

1. Background

"Costa Verde Initiativa 20X20" founded in 2007 is a Non-profit civil association, or political party and/or religious purposes which is governed by the present statute; Title II, Section II of Book of the Peruvian Code and the other current legal provisions that are applicable to it, shall also be subject to the courts of Peru.

2. Mission

To achieve its objectives, the following are the main activities carried out.

2-1. The promotion and management of international technical and financial cooperation activities for human, integral and sustainable development in Peru. in the framework of climate change and the restoration of degraded forest landscapes

2-2. Develop projects, execute consulting or advice and, in general, concrete all kinds of cooperation and collaboration links, according to the law, with national or foreign public and/or private entities that help the fulfillment of their purposes.

2-3. Training, advice and training for professional and business associations linked to the forestry, agroforestry, agricultural, education and environmental sectors in Peru, contributing to the improvement of the living conditions of the general population.

2-4. Contribute to the training and training of adults in the use of new technologies with the purpose of increasing their employment capacity by improving their professional qualifications; of unemployed, unemployed or inactive older people and people with disabilities.

2-5. Organize and disseminate studies and research referred to public administration reform, modernization of the state, decentralization, local governments, transparency in public management, governance, citizen participation, gender issues and the fight against corruption and other similar res.

3. Experience

Since the year of its foundation, the Costa Verde has been very active in the execution of projects, studies, research and promotion of systems for the restoration and recovery of degraded ecosystems, especially in the DFE region of the south coast of Peru, having carried out various projects with national and international entities, such as projects pd 724/14 f and pd 852/17 rev. 4 f with ITTO, projects for the plantation of Tara (Caesalpinia spinosa) in the Camaná desert, study of the biodiversity of Lomas de Aliquippa, with the IPSI, as well as participated in numerous national and international events related to the environment, the forest sector and climate change.

From the implementation of ITTO project PD 724.14 (F), technical experiences in the management and competitive production of Tara in the southern coastal region of Peru were consoilidated through a highly productivity module. In additiion, a technological package for the management of Tara and associated agroforestry systems was developed along with guidelines for SFM in Tara plantations and rehabilitation of degraded and eriaza lands to be applied throughout the coastal region of Peru.

4. Current board of directors

4-1. President: Jorge Malleux
4-2. Vice President; Ignacio Lombardi
4-3. Secretary: Alejandro Maldonado
4-4. Treasurer: Diego Padilla

ANNEX 2: TERMS OF REFERENCE OF PERSONNEL AND CONSULTANTS FUNDED BY ITTO

COORDINATOR / PROJECT DIRECTOR

Forest professional with extensive experience in project administration, forest management, land-use management and field production activities.
Main duties:

- Project technical and administrative coordination.
- Preparation of technical, progress and final reports.
- Participation in the project technical committee (PTC) as secretary; and
- Communication with the ITTO Secretariat, local authorities and all stakeholders involved in the project implementation.

Duration: 12 months

ACCOUNTING (Part time)

Accounting professional with a minimum of 3 years of experience in project account management.
Main duties:

- Project account keeping, including the contributions from ITTO and from the executing agency, co-executing agency and other sources.
- Preparing monthly accounting reports and reporting to ITTO through the Organization's online monitoring system.
- Attending Steering Committee meetings to report on and/or clarify project financial and economic issues as required.

Duration: Along the 12 months of the project duration.

LOCAL CONSULTANTS AND TECHNICAL ASSISTANTS (short terms, according to the project activities and needs)

Local consultants: Forest professionals, economics experts, sociologists, etc. with a minimum of 5 years of experience in the relevant areas of expertise.
Main duties:

- Participate in specific tasks in accordance with the objectives, expected outcomes and activities set out in the project work plan.
- Work in coordination with the Project Coordinator and prepare technical reports on the activities carried out in the relevant field of expertise, including progress and final reports, as appropriate.

Duration: between 1 and 6 months as required to meet project needs and in accordance with the schedule of activities and budget availability.

Technical assistants: Youth professionals or last year university students, in forestry, and another related carrier
Main Duties: To assist the local consultants and the project coordinator in organizing the different activities of the work plan, collect information in the field and office (libraries), assist on interviews to stakeholders.

Duration: between 1 to 6 months as required to meet the project needs and in accordance with the schedule of activities and budget availability

ANNEX 3: FACT TECHNICAL SHEET OF CAOBA (Swietenia macrpphyilla King)

From the Wageningen University & Research (https://www.wur.nl/en.htm)

taxonomy	
author, year	King, 1886
synonym	*Swietenia candollei* Pittier ; *Swietenia tessmannii* Harms ; *Swietenia krukovii* Gleason ; *Swietenia belizensis* Lundell ; *Swietenia macrophylla*var. *marabaensis* Ledoux & Lobato.
family	Meliaceae
Eng. Name	Big-leaf mahogany; Honduras mahogony
other names	aguano, mogno, caoba
Dutch name	Honduras mahonie
subspecies	
varieties	*S. humilis* proposed as an ecotype by Helgason et al. 1996
hybrids	Hybrids of *S. humilis x S.macrophylla* (Costa Rica); *S. mahagoni x S.macrophylla* (Caribbian islands)
references	CAB International. 2005. The Forestry Compendium. www.cabicompendium.org/fc
	Conabio. www.conabio.gob.mx/conocimiento/info_especies/arboles/doctos/37melia5m.pdf#search=%22Swietenia%20macrophylla%22
	Lugo, A.E.; Figueroa, J.C. & Alayon, M (eds). 2003. Big-leaf Mahogany: Genetics, Ecology and Management. 433 pg. Springer: New York
	Lugo, A.E. & Fu, S. 2003. Structure and Dynamics of Mahogany plantations in Puerto Rico. pp:288-328 in: Big-leaf Mahogany. E. Lugo, J.C. Figueroa, M. Alayón (eds). Springer: New York
	Mayhew, J.E. & Newton, A.C. 1998. The silvicullture of Mahogany. CABI
	USDA Natural Resource Conservation Service plants.usda.gov/java/factSheet
morphology	
crown habit	umbrella-shaped crown. fast-growing perennial tree with tall straight, cylindrical bole clear of branches for 12-18m, often with high buttresses.
max. height (m)	50
max. dbh (cm)	200
actual sizes – location, country -	
oldest tree – location-	
leaf length (cm)	16-40
leaf petiole (cm)	0.5-1.2
leaf colour upper surface	dark glossy green
leaf colour under surface	lighter green
leaves arrangement	pinnate leaves arranged alternately a clustered at the ends of branchlets, each leaf consists of 3- 6 pairs of opposite or occasionally subopposite leaflets that are typically 9-14 x 3-5 cm, usually oblong to oblong-lanceolate or ovate-lanceolate
flowering	takes place annually with the timing varying between locations according to climate, usually takes place when trees are deciduous or just coming into new leaf and shortly before the rainy season. In Bolivia flower and leaf production occur simultaneously in September at the onset of the rainy season. In Central America, northern parts of South America, and the Philippines the trees flower in March-June In the southern hemisphere flowering is from September to November. (See pg.4)

flowering plant	monoecious, both sexes in the same inflorescence, with unisexual flowers
flower, inflorescence description	small flowers are borne in auxiliary or sub-terminal inflorescences, unisexual, with both sexes similar, green yellowish, corolla with 5 petals.Each inflorescence is 10-20 cm in length with short lateral, spreading, glabrous branches, generally shorter than the leaves.
flower diameter (mm)	6 to 8 mm
pollination	by insects: bees and moths are believed to be the main pollen vectors, thrips may act as pollinators.
fruit; length	large (12-15 x 6-8 cm), woody, erect, capsules, oblong to slightly sub-globulus. The outer valves are thick and become woody with a coriaceous surface when mature. When dry, the 4 or 5 valved fruits split open from the base, or from the base and the apex simultaneously. The centre of the fruit is a thick, woody 5 angled columella extending to the apex from which the seeds hang pendulous by their wing, leaving conspicuous seed scars after their release.
fruiting	takes place annually with the timing varying between locations according to climate. In Central America, northern parts of South America, and the Philippines the fruits mature from December-March. In the southern hemisphere is from June-September
seed; length	seeds are chestnut colored and 7.5-12 cm in length with wings, 1 cm without, irregular Forms. There are usually about 35-45 winged seeds per fruit.
seed-wing length (cm)	6-7
weight of seeds (kg)	13.000 to 20.000 seeds kg^{-1}
seeds ripen	from end of January to beginning of march, also in July
seed dispersal	by container, wind. Median seed dispersal distance of 32-36 m (Bolivia) and a maximum distance of over 80m. This distance depends on the height of the tree, the height and density of surrounding vegetation and the strength of wind at the time of release.
habitat	
natural distribution	natural distribution from 20°N to 18°S in tropical America. Widely distributed species occurring from the Atlantic regions of south-east Mexico, through Central America (Belize, Guatemala, Honduras, El Salvador, Nicaragua, Costa Rica, Panama), northern South America (Colombia, Venezuela, Ecuador, Peru) and across the southern Amazon Basin, in Bolivia and Brazil.
area natural habitat (ha)	
introduced countries	widely grown across the tropics both on a research scale and as extensive plantations.
plant communities' natural area	semi evergreen and evergreen rain forests, dry forests, moist forests, rain forests, riparian forest, secondary forests
soil type, water	adapted to fine and medium textured soils, not coarse soils, low moisture. Found growing on alluvial soils of considerable fertility, and soils derived from limestone, granite, andesite and other sedimentary, igneous or metamorphic rock formation.
pH-KCl	maximum 7.0 and minimum 4.0
soil fertility	It tolerates soils ranging from deep, poorly drained, acid clays of the wooded swamps, to well drained alkaline soils of the limestone uplands. Maximum development is attained on deep, fertile, moist, well-drained, neutral to mildly alkaline soils.
light	shade intolerant, strongly light-demanding
"optimum natural development"	under tropical dry forest conditions: annual precipitation of 1000-2000 mm, mean annual temperature of 24°C and potential evapo-transpirati on ratio of 1-2.
management	
status natural range	
status introduced range	

first plantation outside natural range	
area of plantations (ha)	150.000 ha (Pandey in press, cited by Lugo & Fu 2003) widely planted in south and south-east Asia, the Pacific Islands, the Caribbean and tropical Africa. Substantial areas of plantation have been established in Indonesia, Fiji and parts of Central America.
application	timber tree
propagation	seed
regeneration	planting
optimal gap size for regeneration	It grows mostly at low average density of one mature tree per hectare or fewer, with no smaller trees and no seedlings or samplings (<1ha^2)
resprouting after cutting	no
growth rate	1 cm dbh yr^{-1} in trees between 15-30 years old
diseases	Reported affecting seedlings in nurseries: *Botryodiplodia theobromae* (stem rot), Corticium *koleroga* (thread blight), *Fusarium* spp. (damping-off fungus), *Pellicularia* spp. (Thread blight), *Rhizoctonia solani* (damping-off fungus), *Sclerotium* spp.
insects	Young trees are attacked by the shoot borer *Hypsipyla grandella* (common pest). Other pests reported affecting seedlings in nurseries are: *Acrocerops auricilla* (leaf miner), *Diaprepes abbreviatus* (sugarcan weevil), *Helopittis antonii* (leaf bug), *Xyleborus abrup- toides* and *X. caffeae* (ambrosia beetle)
wood	
trade name	Honduras mahogany
wood structures key characteristics	True mahogany wood can be identified by its storied rays – on the flat- sawn surface short dark flecks tend to form wavy horizontal bands across the board.
density heartwood (kg/m^3)	540 (at 12% moisture content)
elastic modulus (N/mm^2)	10.600
fungi class durability heartwood	2; durable
heartwood colour	light tan to reddish brown
sapwood colour	reddish brown
contents	
products	principally used for furniture and veneers, being easy to work and strong for its weight, it is suited to a wide range of uses including light construction work, boat building, musical instruments, models and pattern making, sawn or hewn building timbers, carpentry/joinery wall paneling, woodware, turnery, wood-based materials, plywood (see pg.5)
market	High value and quality furniture timber: Sawn timber up to US$1000 per cubic meter. It has been internationally traded for over 400 years. An annual trade between 70.000 and 140.000 m^3 to USA
non-timber products	
seeds	Cosmetic products are produced from the oil of the seeds. The infusion of the seeds is used as tonic, painkiller and against typhoid fever
bark	Used to tan leather and cloth because it has a high content of tannins.

ANNEX 4: TOR for WORKSHOP

Organization of Two Regional Workshops on Ex-situ Conservation and Plantations of Caoba in Peru's Northern Coastal Region

Background and Context: The regional workshops aim to facilitate knowledge exchange and information sharing on the ex-situ conservation and plantations of Caoba (Swietenia macrophylla) in Peru's northern coastal region. The workshops will bring together relevant stakeholders, including researchers, experts, government officials, local communities, and non-governmental organizations (NGOs), to share experiences, best practices, and lessons learned.

Objectives: The main objectives of the regional workshops are as follows: a. To assess the current status of Caoba conservation and plantation efforts in Peru's northern coastal region. b. To share knowledge, experiences, and best practices related to ex-situ conservation and plantations of Caoba. c. To identify challenges, gaps, and opportunities for improving Caoba conservation and plantation initiatives. d. To develop collaborative strategies and action plans for sustainable Caoba conservation and plantation in the region.

Deliverables: a. Analysis report: A comprehensive report analyzing knowledge and experiences on ex-situ conservation and plantations of Caoba in Peru's northern coastal region. b. Workshop agenda: An agenda for each regional workshop, including session details and topics for discussion. c. Pre-workshop materials: Background documents, case studies, and relevant research papers for distribution to participants. d. Workshop proceedings: Comprehensive documentation of workshop discussions, outcomes, recommendations, and action plans. e. Workshop report: A final report summarizing the workshop findings, recommendations, and proposed strategies for Caoba conservation and plantation in the region.

ANNEX 5: RECOMMENDATIONS OF THE AD-hoc EP and MODIFICATIONS

No.	Recommended	Modified	Page
1	Add the list of abbreviations and acronyms which are used in some sections and sub-sections of the project proposal document	Added and improved	iii
2	Add a good map with appropriate scale allowing to clearly indicate the key project sites to be covered by the project implementation	Added 2 maps	iv, 1
3	Improve the Section 1.1 (Origin) with elements regarding the main entities that were involved in the formulation of this proposal Social, cultural, economic and environmental aspects) by properly describing the social, cultural, economic and environmental background of the project area at the time of project identification and further provide appropriate demographic and social data for the people living in the project area while referring to the relevant elements provided in the ITTO Environmental and Social Guidelines (PS-23)	Improved, scientific name, difficulties in preserving it locally, and the government departments supporting the project. cultural, economic and environmental background are improved in section 1.3	1, 3
4	Improve the Section 1.3 (Target area) by adequately describing the social, cultural, economic and environmental background of the target while referring to the relevant elements provided in the ITTO Environmental and Social Guidelines (PS-23), as well as in the ITTO Gender guidelines	Improved, described the social, cultural, economic and environmental background	3
5	Improve the formulation of the development objective and specific objective, as well as their associated indicators (impact indicators of the development objective and outcomes indicators for the specific objective), as required in the ITTO manual for project formulation	Improved, followed ITTO manual. Details were matched in items such as activities, work plans, and budgets	11-16
6	Clarify the need to describe the species Prosopis pallida (Humb. & Bonpl. ex Willd.), Kunth as it is not clearly linked to the scope of this project focusing on the species Swetenia macrophylla, King, in the newly added Section 1.4 describing the northern coastal region of Peru	Deleted. Sentence of 'Prosopis pallida' was deleted	5
7	Provide information on the impacts of the pest attacks due to Hypsipyla grandella, Zeller, on Caoba plantations is not adequately described in the newly added Section 1.5 regarding experiences with Caoba plantations, as well as on the mitigation means, while also adding important technical information on Caoba;	Provided, added about Hypsipyla grandella	1
8	Improve the Section 3.3 (Strategic implementation approach) by considering some relevant elements indicated in the above overall assessment;	Improved, added explanation of the goal of the project and further information	14
9	Amend the Annex 1 (profile of the executing agency) by referring to structure-format required in the ITTO manual for project formulation (pages 67-68, in Spanish version);	Improved. Translated in English, and improved the experience part	20
10	Add as annexes, the terms of reference (1-page maximum TOR) for all three workshops mentioned under the budget line 15 for justifying the amounts budgeted for holding these workshops	Improved, TOR for Workshop was provided	25
11	Include an Annex that shows the overall assessment and specific recommendations of the Ad-hoc Expert Panel and respective modifications in tabular form. Modifications should also be highlighted (bold and underline) in the text.	Added, added this ad hoc EP recommendation and modification	26