

INTERNATIONAL TROPICAL TIMBER ORGANISATION

ITTO

PROJECT PROPOSAL

TITLE:	EXPERIMENTAL COMMERCIAL PLANTATIONS OF CAOBA (<i>Swietenia macrophylla</i>) IN THE NORTHERN COASTAL AREA OF PERU
SERIAL NUMBER:	PD 948/25 Rev. 1 (M)
COMMITTEE:	ECONOMICS, STATISTICS AND MARKETS
PRESENTED BY:	GOVERNMENT OF PERU
ORIGINAL:	SPANISH

SUMMARY

Caoba (*Swietenia macrophylla* King), which is found in tropical rainforests, **has a high commercial value**, but is now listed as an endangered species under CITES due to illegal logging and the occurrence of endemic forest pests and diseases in the Peruvian forest region. Peru was a major exporter in the 1990s, but is now importing timber of this species.

This project proposal has stemmed from ITTO project PD 932/23 (F) whose objective was to identify and evaluate successful cases of small-scale plantations established as an initiative of private companies in the arid zone of the northern Peruvian coast. The previous initiative has shown there is great potential for this type of plantations. In biological terms, this species has demonstrated, in small plantations over 14 years old, that it perfectly adapts to the climate and soil and water conditions of the coastal region, with an average growth of 1.8 cm per year in DAP and 0.8 meters in total height. In addition, there are significant areas of land available for this purpose. Thirdly, private companies, rural communities, and the Peruvian government have shown keen interest in committing to an experimental commercial plantation project, which would establish technical guidelines and provide first-hand economic information, paving the way for large-scale plantations.

The general objective of the project is: **"the conservation and promotion of endangered forest species, such as Caoba, through their reproduction in *ex situ* commercial plantations"** with the specific objective of **"the establishment of experimental commercial plantations to lay the technical and economic foundations for large-scale initiatives"**.

The project envisages the planting of 50 hectares of Caoba (big-leaf mahogany) in the locality of Olmos, Department of Lambayeque, on the northern coast of Peru, in stands of 5 hectares each and under different site conditions, so that consistent technical and economic information can be obtained to justify large-scale investments in the future. To this end, previous project PD 932/23 (F) identified companies and communities that would be willing to participate in the project by contributing land and labour, with the project being responsible for the provision of selected plants, drip irrigation systems and ongoing technical assistance.

Main project stakeholders will be: a) Private sector entrepreneurs, who have taken the initiative to establish Caoba plantations in this area, b) Local communities owning lands suitable for plantations, and c) The public sector and conservation NGOs.

This project proposal is supported by the National Forest Administration (SERFOR), the Association of Forest Plantations of the Northern Coastal Region of Peru, the Regional Government of Lambayeque and several rural communities in this region, as well as academic and research institutions.

EXECUTING AGENCY:	COSTA VERDE INICIATIVA 20X20	
COLLABORATING AGENCIES:	DEPARTMENT OF FOREST MANAGEMENT / UNALM, NATIONAL FOREST AND WILDLIFE SERVICE (SERFOR)	
DURATION:	36 MONTHS	
BUDGET AND POSSIBLE SOURCE OF FINANCE:	Source	Contribution in US\$
	ITTO	<u>494,816</u>
	COSTA VERDE - <u>STAKEHOLDERS (ENTERPRISES AND COMMUNITIES)</u>	<u>498,572</u>
	TOTAL	<u>993,388</u>

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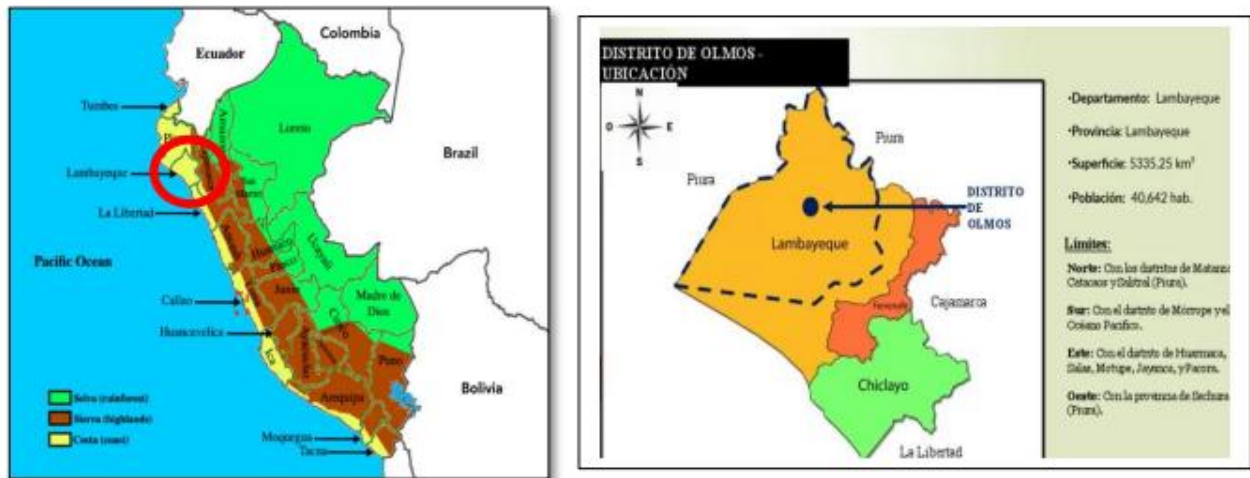
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LIST OF ACRONYMS

CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CN	Concept note
COVID-19	Virus pandemic declared in 2019
DSA	Daily subsistence allowance
INIE	Instituto Nacional de Información y Estadística (<i>National Institute for Information and Statistics</i>)
ITTO	International Tropical Timber Organization
NGO	Non-Governmental Organization
LSSC	Legal and sustainable supply chain
PH	Acidity and alkalinity index of soil and other organic materials
SDGs	Sustainable Development Goals - UN
SERFOR	National Forest Authority, Peru
UNALM	National Agrarian University - Lima Peru

Map of the project area

Figures 1.a and 1.b: Project area in Lambayeque (1.a) and Olmos District (1.b)



Images of soils (2.a) and agricultural business activities in Olmos (2.b)

PART 1: PROJECT CONTEXT

1.1 Origin

This project proposal stems from the results of project PD 932/23 (F) which identified and evaluated individual experiences of private and community enterprises in the establishment of small-scale Caoba (big-leaf mahogany) plantations, with a view to subsequently develop large-scale commercial plantations of this species on the northern coast of Peru, given the critical status of Caoba in its range area (the Peruvian Amazon).

As a result of the evaluations carried out under project PD 932/23 (F), it has been concluded that these initiatives are of great value and that the diverse and valuable experiences on **Caoba (*Swietenia macrophylla* King)** plantations in the arid coastal region of Peru, outside their natural environment, constitute a formidable effort and example that is worth extending and replicating over the entire northern coast of Peru, whose climatic conditions are broadly similar (average annual temperature of 22-23°C), although rainfall and soil conditions are quite different but perfectly manageable or adaptable to the requirements of the species. This could provide an excellent opportunity for the propagation and silviculture of this species, thus relieving pressure on the Amazon rainforest. In its natural range areas, Caoba is under great pressure with negative consequences on the degradation and undervaluation of biodiversity in natural forests, amidst a context of illegal logging.

Peru used to be the world's leading exporter of this timber, and is now forced to import Caoba in order to cover the deficit for the local and international markets. **Caoba is the most expensive wood, favoured 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 administered by public authorities. Most of the Caoba timber exported to the United States comes from illegal logging (90% of exports).**

It is difficult to plant young Caoba trees for economic or biodiversity conservation purposes in their native range areas because they are affected by *Hypsipyla*. This project will focus on localities that are far from the risk of *Hypsipyla*.

The possibility of planting Caoba in the coastal region of Peru (Department of Lambayeque), opens up a great perspective to solve the problem of biodiversity loss in the Amazon region while finding new opportunities for the plantation, logging and processing of this timber in a region that is the most important supplier of the demanding market and that offers better facilities for industrial processing and export.

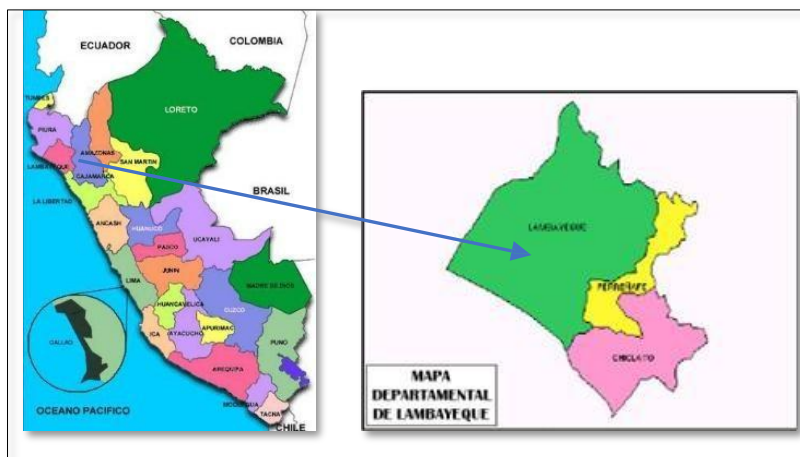


Figure 2. Map of Peru and the Departments of Lambayeque and Chiclayo

This project proposal is supported by the National Forest Administration (SERFOR), the Association of Forest Plantations of the Northern Coastal Region of Peru, the Regional Government of Lambayeque and several rural communities in this region, as well as academic and research institutions.

1.2 Relevance

1.2.1 Conformity with ITTO objectives and priorities

This project proposal is in line with ITTO's main objectives and priorities as set out in its strategic priorities and cross-cutting strategies for 2022-2026, namely:

Strategic priority 3: Resilience, restoration and conservation - Reducing tropical deforestation and forest degradation, enhancing forest landscape restoration and forest ecosystem resilience to climate change, and conserving forest biodiversity and ecosystem services.

Strategic Priority 4: Statistics and information - Improving 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 agendas

It is worth highlighting the importance and relevance of the project to the UN Sustainable Development Goals (SDGs) 2030, in particular, SDGs 1, 12, 13 and 15.

1. SDG 1 - No poverty: The project can help alleviate poverty among small farmers by providing them with a new, sound alternative to improve their livelihoods; SDG 12 - Responsible consumption and production: this initiative will contribute to the sustainable management of natural resources; SDG 13 - Climate action: The project will contribute to climate change mitigation and adaptation as ecosystems could be adapted to produce new resources for the benefit of the population; and SDG 15 – Life on land: Human life depends on the land as much as the ocean for our livelihood and existence. 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 of clean air and water, as well as being crucial for combating climate change.
2. Global Forest Goals (UNFF): 1, 3, 4, 5 and 6 - 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 victim and an important part of the solution. Sustainably resourced and well-managed forests can boost employment, disaster risk reduction, food security and social safety nets, to name a few. Forests can also protect biodiversity and support climate mitigation and adaptation. In terms of global health, safeguarding and restoring forests are among the environmental actions that can reduce the risk of future outbreaks of zoonotic diseases.

Regarding climate change aspects, it is important to point out that the project is closely related to climate change adaptation, as it will tap on the potential of the arid northern region of the country for the plantation of Caoba, which represents a real alternative for the conservation of the Amazon rainforest. Mitigation is also an important issue addressed in this project, considering the potential reduction of biodiversity loss and the control of illegal logging.

1.2.3 Relevance to the submitting country's policies

The Peruvian Government has declared the development of forestry and wildlife to be a national priority, translating it into the generation of opportunities for the well-being and development of the national population. It has also reaffirmed its respect for the environment and its will to maintain and enhance the natural capital contained in forest and wildlife resources. The National Forestry and Wildlife Policy recognises the promotion of research, innovation, training and technology transfer in the forestry and wildlife fields as strategic guidelines. Furthermore, the current Forestry and Wildlife Law (29763), in its article 137, declares forestry research to be of national interest.

In this regard, SERFOR, the National Forest Authority in collaboration with different stakeholders of the forestry and wildlife sector, has developed the National Plan for Forestry and Wildlife Research (*Plan Nacional de Investigación Forestal y de Fauna Silvestre* - PNIFFS) as a strategic instrument to promote the uptake of scientific knowledge and technologies that respond to the needs of the forestry and wildlife sector. Furthermore, the National Strategy for Forests and Climate Change (*Estrategia Nacional sobre Bosques y Cambio Climático* – ENBCC) (Supreme Decree N° 007-2016-MINAM) is a management document establishing standards for the design and implementation of public policies, programmes, projects and actions to reduce deforestation and forest degradation, seeking innovative/smart alternatives for sustainable land-use planning,

restoration of degraded ecosystems and sustainable forest management to stop illegal timber logging and trade.

With regard to the CITES and CBD conventions, Peru is strictly following all rules and provisions. In the case of Caoba, since the listing of the species in CITES Appendix III, Peru is closely monitoring logging and export procedures, having established an annual logging quota, which is currently about 2,500 m³ (less than 10% of the logging carried out during the 1980s and 1990s). In addition, Peru has developed two (2) projects in cooperation with ITTO/CITES with the objective of assessing the status of natural regeneration of Caoba in the Amazon region, and a strategy to ensure its conservation and reforestation.

1.2.4 Gender considerations

According to the country's policy, gender issues should always be considered. In this case gender considerations will be taken into account for the implementation of field activities, especially in nursery and reforestation activities. Women's participation in field activities will remain at above 40% throughout the implementation of the project.

1.3.1 Target area

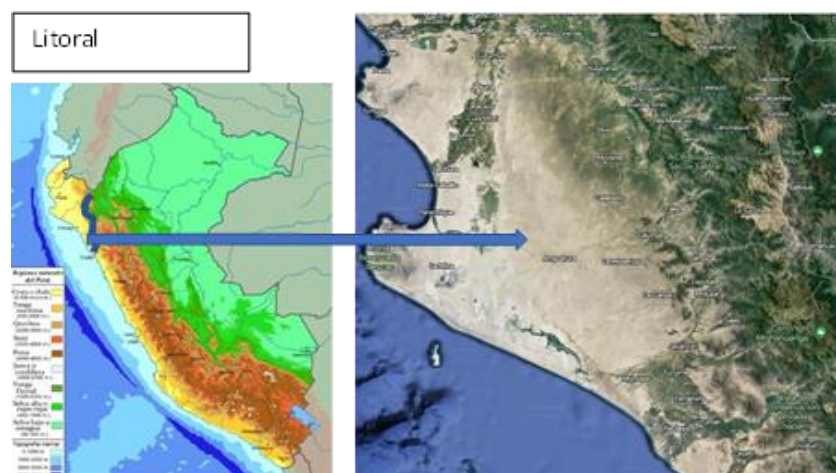
The project's area of influence is the northern coastal region of Peru, more specifically the departments of Lambayeque (where project headquarters will be located), Piura and Tumbes.

The coast of Peru is a bleak, often rocky and mountainous desert stretching from Chile to Ecuador, dotted with fifty-two small rivers that descend through rugged, arid mountains and flow into the Pacific Ocean. The *Costa* region is a harsh landscape of large dunes and rolling expanses of barren land, a desert, but with periods of humidity reaching 90 percent in the winter months from June to September, when temperatures average around 20°C. Temperatures along the coast rise near the equator in the north, where summer can be very hot, and drop to cooler levels in the south. If weather conditions are right, there can be a sudden burst of delicate plant life in certain places. This is made possible by dense fog. However, the fog is only enough to moisten the air, allowing it to condense in some specific areas, called "Lomas" (a unique ecosystem, where low and dense vegetation grows). These conditions greatly favour the preservation of delicate archaeological remains. The environment also facilitates human habitation and housing because the climate is mild and the lack of rain reduces the need for water-tight roofing.

In addition to the above description of desert areas, the northern coastal region is also known for the presence of the **seasonally dry Equatorial-Pacific dry forests of Northwestern Peru** (also known as the Tumbesian region) which are among the most unique and biodiverse forests on earth. These tropical deciduous forest habitats have evolved in isolation, in a relatively constant climate, maintained by the cold Humboldt ocean current.

The target area is the northern coastal region of Peru, particularly the **District of Olmos** in the department of Lambayeque, where a typical tropical dry forest ecosystem is dominant. This region has annual rainfall ranging from 150 to 350 mm/year and an average annual temperature of 22-23°C.

Figure 3. Partial view of Pampa de Mocan in the Olmos District



The District of Olmos has the largest land area in the Lambayeque region, with an area of 5,335.25 km², accounting for 51% of the territory of the province of Lambayeque and 33% of the Lambayeque region.

The Olmos District currently has a vast rural area and more than 165 duly recognized hamlets, meaning they have tenure or governance, and there are also other smaller villages that have not yet been recognized.

Among the most noteworthy villages are: Nitape, Imperial, La Pilca, La Orchilla, El Empalme (intersection of the Interoceanic Highway and the road to Lambayeque). Cascajal, Los Panales, La Choza, Callejón de Cascajal, Filoque, El Pueblito, San Isidro, Garbanzal, Sincapi, Mano de León, Racalí, El Tocto. Aliclá, Las Pampas, El Muerto, Pañalá, La Estancia, Laguna Larga, Sequión, San Cristóbal, El Pasaje, Pasábar, El Puente, El Abra, Escute, La Calera, Senquelo, San Pablo de Escurre, Boca Chica, Mocape, Insculás, Cerro de Falla, El Porvenir, El Mango, La Victoria, Tierra Rajada, El Progreso, Redondo, Vega del Padre, Santa Rosa, La Esperanza, Fícuar, Ancol, Chúncar, Cerro de Arena, Alto Roque, Las Pozas, Corral de Arena, Cerro Teodoro, Nichito, Las Sábilas, Querpón, El Progreso Badén. El Paraíso, La Capilla Central, Capilla, Ñaupe, Las Animas, El Virrey, and Hualtaca Chico, among others.

1.3.1.1 Potential conflicts over land use

As is the case throughout the country, land that is not formally designated for a specific use, in accordance with the National Land Classification Regulations and the national forest zoning program, is effectively available to third parties, and this is where most conflicts over land use and tenure arise. In the Department of Lambayeque, nearly 80% of the land is owned by rural communities, and land used for industrial crops that was originally classified as forest land has been granted change of use authorization by the national forest authority.

In any case, the selection of sites for the plantations planned in this project is within the lands officially assigned to private companies or rural communities, so it is understood that there will be no conflicts of use in any of the cases. In any event, the project will take the necessary precautions to ensure that this does not occur, considering this a priority issue.

Access to forest land in Peru on State-owned lands is granted through concessions for timber harvesting and other uses, as well as for reforestation, which will not be necessary in this case since the lands planned for this project are already allocated for that purpose.

1.3.2 Social, environmental and economic aspects

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

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

The total population is about 1,320,000, with an economically active population of 700,000, of which 96 are employed.

- Total poverty: 14%,
- Urban population: 84%,
- Area of rural communities: 448,000.00 ha - officially recognized

The Department of Lambayeque has an economy based on agriculture, commerce and services. At the socio-economic level, the region has a poverty rate ranging from 18.2% to 24.7%.

The **District of Olmos** is expected to be the central area for field activities, as it meets all the environmental conditions required for the successful implementation of this project. It is located in the northern region of Peru; it is one of 12 districts in the province of Lambayeque, located in the Department of Lambayeque, under the administration of the Regional Government of Lambayeque, in Peru. It is the district with the largest land area in the province of Lambayeque.

Among the country's regions, Lambayeque has the ninth highest Human Development Index (HDI) at the national level. However, the poverty rate in the region ranges between 18.2% and 24.7%, and the level of extreme poverty ranges between 1.1% and 3.0%.

By 2021, Lambayeque's GVA structure according to economic activity sectors in order of importance was as follows: other services (27.2%), trade (18.1%), construction (10.3%), agriculture (10.2%), manufacturing (9.6%), telecommunications (7.3%), public administration and defence ().

The Lambayeque region has a poverty rate ranging between 18.2% and 24.7%, and a level of extreme poverty between 1.1% and 3.0%.

Main economic sectors:

Agriculture (27.3%), Transport (22.1%), Other services excl. public utilities (18.9%)

PRIMARY SECTOR: Agriculture, Livestock, Hunting, Fishing, Forestry and Mining.

SECONDARY SECTOR: Manufacturing Industry and Construction.

TERTIARY SECTOR: Trade and Services.

Considering that the annual temperature in this region is similar to that of the Amazon, where Caoba grows naturally, a number of private entrepreneurs took the initiative to establish small-scale experimental plantations using drip irrigation systems, with reported successful results that need to be noted and collected to obtain the necessary information to establish a good benchmark on the outcomes and future prospects of new plantations of this valuable species, with the additional advantage that this region is apparently free of *Hypsipyla* and also close to demand markets, industrial centres and seaports for export.

These pilot Caoba plantations have been established on small plots of land in deforested areas or barren lands in the departments of Lambayeque, Piura, and Tumbes, with prior authorization from the National Forest Service.

The following figures show the areas where plantations were identified in the Department of Lambayeque (capital - Chiclayo).



Figure 4: Views of typical land-use landscapes in the Olmos District

Preliminary identification of areas available for forest plantations in the district of Olmos has been completed, with approximately 2,500 hectares found to be immediately available for a commercial-scale Caoba reforestation plan (see Table No. 1). These lands belong to the company *Arena Verde*, which is currently engaged in the production of blueberries and asparagus on an area of more than 5,000 hectares.

The area of land earmarked for forest plantations borders blueberry and asparagus crops, with the advantage of moist soil due to drip irrigation used on these crops. The company is also interested in promoting a forest belt to conserve the ecosystem and protect riverbanks. Similarly, there are several other companies interested in developing the same model, in addition to rural communities that have large tracts of land available for forest plantations.

Table 1. Identification of tentative areas for future Caoba plantations

SECTOR	Restoration (planting and protection of natural resources)	Reforestation with assisted irrigation	Total area in hectares
San Cristobal Grande	150.00	625.00	775.00
Querpon	250.00	1,450.00	1,700.00
Total area in hectares	400.00	2,075	2,475.00

1.3.3 Expected outcomes at project completion

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

Furthermore, the report will be distributed to relevant stakeholders, such as government agencies, NGOs and other interested parties, so that the information obtained through this project may be used to refine restoration handbooks and implementation guidelines for endangered species on the northern coast of Peru.

This would lead to a clearer scenario regarding the prospects of planting Caoba in the semi-arid region of the country rather than in the Amazon region, where growing conditions make it extremely difficult, and would at the same time help avoid unsustainable and illegal logging practices.

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

Expected outputs of this project are as follows:

Output 1 Organization of an interest group between companies and communities for the planting of 50.0 hectares of Caoba.

Output 1: Identification, structuring and organization of a business and community interest group for the planting of experimental commercial Caoba stands.

1.1 Planning and organization of the work plan

1.1.2 Development of protocols and terms of reference for technical and administrative activities

Output 2: Planting of ten 5-hectare experimental modules of Caoba.

2.1 Selection of 10 sites and qualified stakeholders for the establishment of 5.0-hectare stands.

2.2 Planting of 10 5-hectare stands amounting to a total 50.0 hectares of planted Caoba under a drip irrigation system.

Output 3: Training and development of a technical handbook for outreach, preparation of a technical handbook for dissemination of plantation results

Workshop 1 Organization of interest group, participation rules, and technical, logistical and administrative aspects

Workshop 2 Plantation management, follow-up and monitoring of field activities, economic control matrix

Workshop 3 Workshop for final validation of the information collected for the development of a technical handbook.

PART 2: PROJECT RATIONALE AND OBJECTIVES

2.1 Rationale

For several decades, Caoba planting and growing has been a real challenge full of discouraging experiences, except for a few isolated cases in small areas, giving little hope that it could be replicated on an economic scale in tropical rainforests. This is due, in particular, to the virtually impossible control of attacks by *Hypsipyla grandella* Zeller, known as the 'meliaceae borer', which affects almost 100% of young plants, both inside and outside the forest, despite enormous (biological, mechanical, genetic) efforts to control it.

Other factors that hinder Caoba reproduction include finding a favourable habitat for it to grow naturally i.e. soil texture, pH, humidity, annual temperature, etc. However, these factors can be accommodated without too much difficulty, meaning that soil conditions can be managed to obtain the right conditions, and humidity can now be controlled through drip irrigation or simply by providing the right amount of water to the plantation. The advantage of the north coast is the average annual temperature, which is very similar to that of Caoba's natural environment, or around 21 to 25 degrees Celsius.

An excellent example of successful planting of Caoba outside its natural environment is Fiji, where approximately 55,000 hectares of plantations of the valuable *Swietenia macrophylla* (Caoba) species are grown, and there are plans to continue expanding this area. Harvesting began in 2003. The management and marketing of Caoba resources will influence the future success of Fiji's timber industry. Temperatures vary seasonally: from June to October, which is the dry season, the temperature is 16°C, while in the rainy season (December to April), it can reach up to 32°C, and the sea temperature is usually around 30°C. Rainfall decreases from east to west: in the east rainfall reaches about 3,000 mm, while in the west it is only 1,800 mm. Other important entrepreneurial experiences have been implemented in Java, Indonesia, with promising results.

These experiences inspired several private entrepreneurs in Peru, who took the initiative to plant this species on the northern coast of the country, with apparently successful results.

Several attempts to plant Caoba in the Amazon region of Peru, as well as in the tropical rainforest of Latin America, have failed due to the extreme difficulties of its silvicultural management and attacks by *Hypsipyla*, which cause early branching of tree stems and a serious loss of commercial value. This has discouraged many private sector operators from continuing their efforts, leading them to switch to other native and exotic species that are less difficult to grow. At the same time, however, Caoba logging continues, steadily reducing the natural stock of this species and draining the biodiversity of the tropical forest.

The growth of Caoba in the conditions of the northern coast of Peru, Olmos, with an annual average of 1.8 centimeters in diameter and 0.8 meters in total height, which in general is almost equal to the yields obtained in the Amazon region, is a clear and encouraging indication of its perfect adaptation to these climate and soil conditions, despite the fact that these plantations have not received adequate treatment, such as thinning, pruning, and fertilization.

These average annual growth rates in diameter and height –considering an average DBH of 25.0 cm and an average height of 6.0 m– assuming that the necessary thinning is carried out to eliminate 50% of (small and poorly formed) trees, allow us to estimate an average volume growth of approximately 28-30 m³/ha/year, **ranking it as a plantation with good growth, with the addition of a bonus if fertilization and good silvicultural management are applied.**

2.1.1 Institutional structure

This project is of national interest and is within the priorities established by the government in the area of reforestation and restoration or rehabilitation of barren and degraded lands on the Peruvian coast, which includes an estimated 200,000 hectares of commercial plantations, preferably of native species, and 400,000 hectares of areas for the restoration/rehabilitation of degraded ecosystems. Therefore, it is expected that the State will play a prominent role in the organizational structure, especially at the regional level (Regional Government) in the political, technical, and logistical components.

The technical guidelines resulting from this project to promote and guide rehabilitation and commercial planting activities will be one of the most important expected outcomes. The participation of rural communities will also play a very important role, considering that almost 80% of the land in the Department of Lambayeque is part of community lands. Similarly, it is important to highlight the role of private enterprises as the leading players in investments in commercial plantations and land rehabilitation.

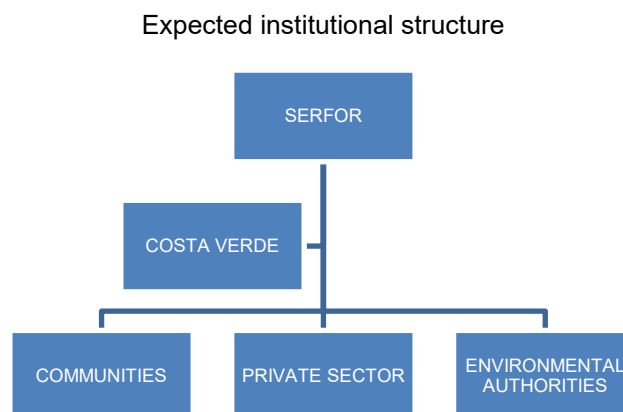
The NGO *Costa Verde*, as the promoter and leader of this project, will be responsible for inter-institutional coordination and project administration.

This will ensure that the institutional structure is well balanced, with responsibilities shared as follows:

- NGO *Costa Verde*: inter-institutional coordination and project administration
- Central and regional governments: rehabilitation and plantation policies
- Rural communities: promotion of restoration and reforestation
- Private sector: promotion of investment in commercial plantations

Based on this institutional framework, a Project Steering Committee will be set up, chaired by the government agency, with the NGO *Costa Verde* as technical secretary, the rural communities as beneficiaries and providers of logistical support, and the private sector as beneficiaries and promoters of investment.

Figure No.5: Project Organizational Structure



2.1.2 Stakeholder analysis

The project will improve information and assessment tools to identify conditions and locations for reforestation in the northern coastal region of Peru. Local governments and rural communities will also be important stakeholders in this project. The direct beneficiaries of the project will be small farmers and, in general, low-income rural communities 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 to establish experimental plantations in this part of Peru for the last 15 years, obtaining important and encouraging results that deserve to be used to collect more detailed information about their experiences.

The project is expected to visit and interview all relevant entrepreneurs, conducting a comprehensive survey of their experiences in the field, collecting data on the area, soil conditions, irrigation, and the origin of seeds and seedlings used for the plantations. The project will attempt to reconstruct the timeline with all the details in each case, and participants will be asked to collaborate, possibly by providing a detailed report of their findings during technical meetings and workshops.

In addition to experiences with Caoba planting, information will also be collected on experiences with other native species, with the aim of comparing results and lessons learned, particularly from the perspective of their contributions to biodiversity and the livelihoods of the local population.

- ii) Communities and small farmers who are interested and participate in reforestation initiatives in the semi-arid area will also be considered important stakeholders, given that they own more than 70% of the land in this region.

Interviews and field visits will be scheduled with them, as well as surveys to gather information on their interests, experiences, and availability of land for reforestation and forest ecosystem conservation.

Identification of leaders and their potential involvement in a broad reforestation and restoration program. If possible, they will be asked to provide a written report on their experiences.

- iii) The public sector, including forestry and environmental institutions and local authorities, is considered to be an important stakeholder in the provision of official and reliable information on reforestation and restoration initiatives, promotion and development. The participation of this sector in surveys, providing logistical and operational support, will be a key part of successful data collection and systematization.
- iv) NGOs working in the project's area of influence will be contacted to learn about their views and experiences in forest plantations and related issues.
- v) Academia (universities and research institutions) will play a crucial role in analyzing informative, technical and scientific elements that need to be taken into account. Their participation in workshops and technical meetings will be ensured. 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 such as: Pedro Ruiz Gallo University (Lambayeque) and the Research Institute of the Peruvian Amazon (IIAP).

2.1.3 Problem analysis, problem tree and solutions tree

The key problem is that Caoba is becoming extinct in the tropical rainforest, which is its natural range area, and as an alternative, there is the possibility of conservation and economic use through planting in the Peruvian coastal region, which is a semi-arid area, but there is a lack of information necessary for planting in this semi-arid region.

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

Over the past two decades, interesting but incomplete information has circulated about initiatives by private entrepreneurs and civil society to establish small plots of *Swietenia macrophylla* in the arid and semi-arid conditions of the northern coastal region of Peru. However, this information was not taken seriously by the public sector until recent years when, after visiting some of these stands, significant evidence of their existence and potential success was collected. Nevertheless, this information is still far from being complete and detailed. Therefore, a well-organized plan and project is needed for the formal collection and evaluation of these data in order to issue a serious and reliable report on the actual status of these experiences.

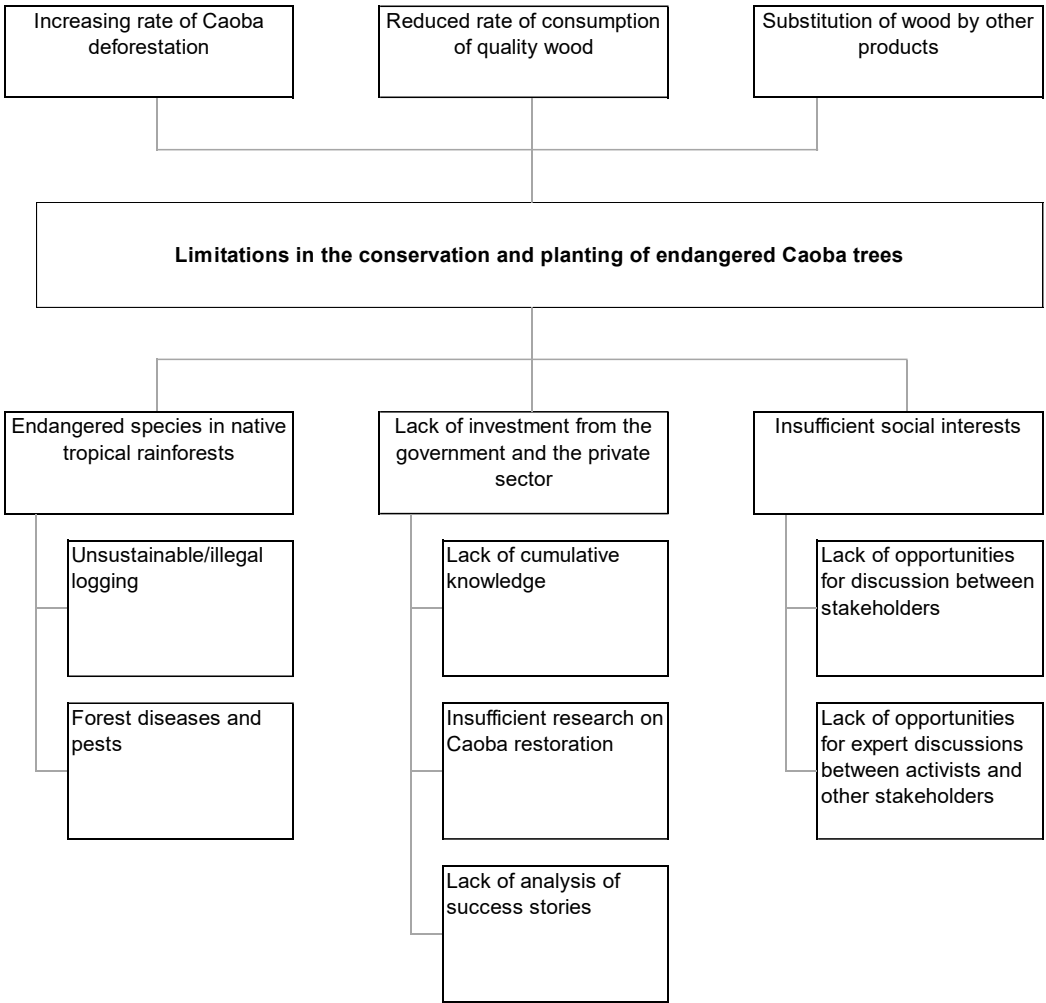
The lack of an integrated state forest research plan that promotes innovative solutions to halt deforestation and forest degradation in the Amazon and semi-arid regions is one of the problems that need to be addressed, with the aim of initiating a basic research plan for data collection and systematization on the potential opportunities of different strategies to halt deforestation in natural forests and seek alternatives that promote private sector investment, recovering huge areas of barren land for reforestation and alleviating the heavy pressure of logging and deforestation in the Amazon region. This could be done by taking advantage of new technologies for planting, propagation, irrigation, and soil improvement, also contributing to adaptation to climate change and opening up new income-generating alternatives for the improvement of the livelihoods of the local population.

The project will provide concrete and consistent data on socioeconomic and environmental aspects that will enable entrepreneurs to have more reliable information to make swift decisions in the context of this new opportunity, implementing high-quality and efficient forestry and agroforestry investments backed by technical and financial assistance, particularly for small forest operators.

The outcome, as expected, will be clear evidence that, even in the most challenging scenario, it is always possible to find appropriate and viable solutions and opportunities for the forest sector. The implementation of new forest plantation opportunities will be largely justified and compensated by environmental and socioeconomic benefits in the short, medium, and long terms.

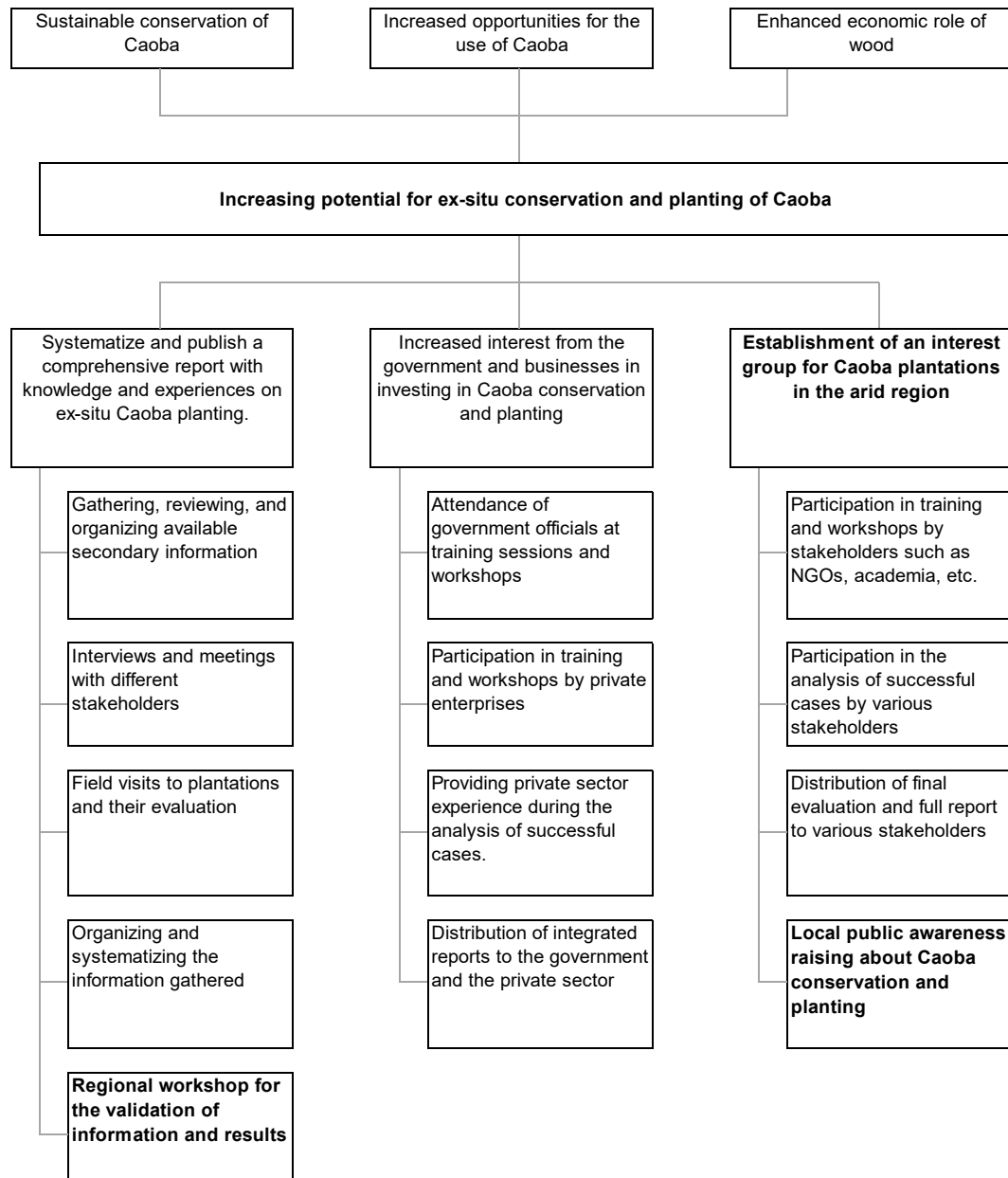
2.1.3.1 Problem tree

Figure 6. Problem tree



2.1.3.2 Solutions tree

Figure 7. Solutions tree



2.1.4 Logical framework

2.1.4.1 Logical framework matrix: objectives-outcomes

Table 2. Logical Framework Matrix: Objectives

OBJECTIVES	IMPACT INDICATORS	SPECIFIC OBJECTIVE	IMPACT INDICATORS	EXPECTED OUTCOMES	MEANS OF VERIFICATION	ASSUMPTIONS
OVERALL OBJECTIVE						
CONSERVATION AND PROMOTION OF ENDANGERED FOREST SPECIES, SUCH AS CAOBA, THROUGH THEIR REPRODUCTION IN <i>EX-SITU</i> COMMERCIAL PLANTATIONS	Demonstration of the technical possibilities and economic benefits of <i>ex-situ</i> Caoba planting	ESTABLISHMENT OF EXPERIMENTAL COMMERCIAL PLANTATIONS TO LAY THE TECHNICAL AND ECONOMIC FOUNDATIONS FOR LARGE-SCALE INITIATIVES	Establishment of successful demonstration stands for Caoba plantations.	Organization of an interest group between enterprises and communities for the planting of 50.0 hectares of Caoba.	Record of the formal agreement establishing the interest group, indicating commitments, responsibilities, and work plan (roadmap)	Voluntary expression of interest and registration of representatives of enterprises, communities, and NGOs to participate in the interest group. Criteria and conditions for participation
	Reduced logging pressure in the Peruvian Amazon.		Encouragement of government and business interest in investing in the conservation and planting of Caoba on barren and degraded lands in the coastal region.	Planting of 10 5-hectare experimental modules of Caoba	50 or more hectares of plantations with financial support from the project, in plots of 5.0 hectares each, with SERFOR plantation registration	Voluntary registration with a commitment to allocate 5.0 hectares or more for commercial Caoba plantations, with provision of irrigation water and labour for the duration of the project.
	Improved technical knowledge among stakeholders.		Interest groups' decision to invest in large-scale commercial plantations	Training and development of a technical handbook for dissemination	At least 50 people technically trained in Caoba plantations. Technical handbook of guidelines for forest plantations in coastal areas.	Organization and implementation of a training plan, technical workshops, and availability of training materials

2.1.4.2 Logical framework matrix: Outputs-Activities

Table 3. Logical Framework Matrix: Outputs-Activities

OUTPUTS/ACTIVITIES	MEANS OF VERIFICATION	ASSUMPTIONS
OUTPUT 1 ORGANIZATION OF AN INTEREST GROUP BETWEEN ENTERPRISES AND COMMUNITIES FOR THE PLANTING OF 50.0 HECTARES OF CAOBA.		
1.1 Identification, development and organization of a business and community interest group for the planting of experimental commercial Caoba stands	Record of establishment of the interest group certified by the regional authority.	Voluntary registration of participants in accordance with an established protocol.
1.2 Planning and organization of work plan	Record of approval of the work plan by the Steering Committee	Sufficient beneficiaries have registered with their corresponding contributions and commitments.
1.3 Development of protocols and terms of reference for technical and administrative activities	Regulation of protocols and terms of reference for the implementation of the operational plan, validated by the Steering Committee.	The EA will submit the proposal for approval by the SC.
OUTPUT 2: PLANTING OF TEN 5-HECTARE EXPERIMENTAL MODULES OF CAOBA.		
2.1 Preparation of sites for the establishment of experimental modules	Georeferenced location plans and formal commitments signed by participants with Steering Committee approval	Sites for the installation of modules with deficient plantations have been identified, validated, and approved.
2.2 Acquisition of materials, equipment, and supplies for plantations	Needs assessment for each stand, selection and acquisition of irrigation materials and equipment	All sites are validated to cover the full 50 hectares and commitments have been signed by all parties.
2.3 Planting of modules under a drip irrigation system	On-site verification of stands, with six-monthly reports on their management and progress. Technical document validated by the Steering Committee	Monitoring has been carried out, reports have been systematized and technical, economic and environmental experiences have been identified and validated.
PROGRESS REPORT 1	Report approved by the Steering Committee and ITTO	ITTO's progress report cycle is completed.
2.4 Ongoing monitoring and technical and economic evaluation of all activities	Bimonthly beneficiary reports and six-monthly project reports	All parties concerned submit their monitoring reports on time.
OUTPUT 3: TRAINING OF STAKEHOLDERS AND BENEFICIARIES		
3.1 Development and approval of the ongoing plantation monitoring and evaluation system	Workshop 1: Detailed workshop report with list of participants and results	The training plan and syllabus for the workshop have been developed, with sufficient number of participants.
3.2 Ongoing systematization of the information collected	Workshop 2: Detailed workshop report with list of participants	The training plan and syllabus for the workshop have been developed, with sufficient number of participants.
3.3 Preparation and dissemination of a technical newsletter on plantation progress	Workshop 3: Use of technical manuals for technological package	
FINAL REPORT	Project Completion Report approved by the Steering Committee and ITTO.	The dates and conditions for the final report are met.

Project objectives

2.2.1 Development objective and impact indicators

Development objective: **Conservation and promotion of endangered forest species, such as Caoba, through their reproduction in *ex situ* commercial plantations.**

Impact indicators

- 1.1 Demonstration of the technical possibilities and economic benefits for *ex situ* Caoba planting.**
- 1.2 Reduced logging pressure in the Peruvian Amazon.**
- 1.3 Improved technical knowledge among stakeholders.**

2.2.2 Specific objective and impact indicators

Specific objective: **Establishment of experimental commercial plantations to lay the technical and economic foundations for large-scale initiatives.**

Impact indicators

- 2.1 Establishment of successful demonstration stands for Caoba plantations.
- 2.2 Encouragement of government and business interest in investing in the conservation and planting of Caoba on barren and degraded lands in the coastal region.
- 2.3 Interest groups' decision to invest in large-scale commercial plantations

PART 3: DESCRIPTION OF PROJECT INTERVENTIONS

3.1 Expected outputs, activities and inputs

At the end of the project the following outputs are expected to be produced:

1. Organization of an interest group between enterprises and communities for the planting of 50.0 hectares of Caoba.

An interest group will be established between beneficiaries, enterprises and communities, which will identify the areas to be planted, for a total of 50 hectares in modules of 5.0 hectares each. The group will assume responsibility for planting and maintaining this area, with bimonthly and six-monthly controls.

2. Plantation of 10 experimental modules of Caoba of 5.0 hectares each.

The interest group together with the Steering Committee will select the most suitable sites for the plantations. The members of the group will be responsible for providing irrigation water and labour, while the project will provide technical assistance, as well as operating equipment and materials and equipment for the installation of drip irrigation systems.

3. Training and development of a technical handbook for outreach

The project will organize short training courses and two technical workshops with the participation of users and beneficiaries as well as an outreach program for the dissemination of experiences and results among the general public.

3.2 Activities and inputs

Table 4. Objectives, outputs and activities matrix

SPECIFIC OBJECTIVE:	OUTPUTS	ACTIVITIES	INPUTS
Establishment of experimental commercial plantations to lay the technical and economic foundations for large-scale initiatives	Organization of an interest group between enterprises and communities for the planting of 50.0 hectares of Caoba	1.1 Interview and select participants of the plantation interest group. 1.2 Field visits and evaluation of selected plantation sites 1.3 Establish protocols and guidelines for working with participants. 1.4 Briefing and working meetings with the selected group 1.5 Workshop 1 - organization of plantation	Registry of interested parties Evaluation form and selection of sites and participants Transport Meeting room
	Plantation of 10 experimental modules of Caoba of 5.0 hectares each.	2.1 Preparation of sites for the establishment of experimental modules 2.2 Procurement of materials, equipment and inputs for plantations 2.3 Planting of modules and establishment of drip irrigation system	Technical guide for the preparation of selected sites Purchase of irrigation equipment (hoses, drippers, pipes, valves). Inputs: compost, organic fertilizer Meeting room

SPECIFIC OBJECTIVE:	OUTPUTS	ACTIVITIES	INPUTS
	Training and development of a technical handbook for outreach	3.1 Development and approval of regular plantation monitoring and evaluation 3.2 Regular systematization of the information collected 3.3 Preparation and dissemination of technical newsletter on the progress of plantations.	Monitoring and systematization forms Access to media Meeting room

3.3 Implementation approaches and methods

The purpose of this project is to establish commercial plantation modules for successful afforestation of Caoba trees in semi-arid areas. To this end, the following strategies and methods will be established and promoted.

An interest group will be organized to participate directly in the plantations, after evaluation of skills, conditions and responsibilities. This interest group would tentatively be made up of the following enterprises and communities, which have confirmed their participation in the project, making available the necessary area as listed below:

Table 5. Committed land area for experimental commercial plantations

Enterprise/community	Available land area	Location	Details
Arena Verde Agricultural Company	20 ha	Morrope Lambayeque	
Agro visión Agricultural Company	10 ha	Olmos Lambayeque	In boundary hedges
SAkMICO SAC Consulting Firm	5 ha	Olmos Lambayeque	In small stands
Proyectos la Selva Consulting Firm	5 ha	Olmos Lambayeque	In small stands
San Pedro de Morrope Farming Community	10ha	Morrope Lambayeque	In small stands
Santo Domingo de Olmos Farming Community	10 ha	Olmos Lambayeque	In small stands
TOTAL	60 ha		

- A. Ten plantation modules of 5.0 hectares each will be established with selected nursery plants upon agreement and approval of standards. Each person responsible for a 5-hectare module will be required to provide: a) the land, duly cleared from a legal standpoint, b) sufficient water supply for irrigation (at least 2,000m³/ha/year), c) labour for the entire duration of the project (3 years) to carry out site preparation, planting, tending, irrigation, fertilization, cleaning, etc. d) a water reservoir with sufficient capacity to irrigate 5.0 hectares for one week, e) ongoing maintenance of the plantation for two years after project completion and assistance in the assessment of the relevant stand, and f) by the end of year 5 of plantation establishment, beneficiaries will be free to dispose of the stumpage value of their plantations, as well as all materials and equipment received.

The project will provide the following: a) materials for the installation of drip irrigation systems: watering hoses and fittings, drippers, valves, stopcocks, a 3.0 HP motor pump, b) compost and organic fertilizers according to plantation requirements, and c) ongoing technical assistance throughout the life of the project.

- B. The project will have an ongoing technical assistance program and plan for all participants and stakeholders, including technical sessions, work meetings and specialized workshops, as well as the systematization and ongoing evaluation of all activities for dissemination at the regional and national levels through various media.

3.4 Work plan - schedule of activities

Table 6. Work plan

	QUARTERS											
ACTIVITIES	1	2	3	4	5	6	7	8	9	10	11	12
Output 1. Organization of an interest group between enterprises and communities for the planting of 50.0 hectares of Caoba												
1.1 Identification, development and organization of a business and community interest group for the planting of experimental commercial Caoba stands												
1.2 Planning and organization of work plan												
1.3 Development of protocols and terms of reference for technical and administrative activities												
Output 2: Planting of ten 5-hectare experimental modules of Caoba												
2.1 Selection of 10 sites and qualified stakeholders for the establishment of 5-ha stands and establishment of nursery for the production of 60,000 caoba seedlings												
2.2 Planting of 10 5-hectare stands amounting to a total 50.0 hectares of Caoba planted under a drip irrigation system.												
2.3 Development of a technical information handbook for the dissemination of plantation results												
PROGRESS REPORT 1												
2.4 Ongoing monitoring and technical and economic evaluation of all activities												
Output 3: Training and development of a technical handbook for outreach.												
3.1 Development and approval of the ongoing plantation monitoring and evaluation system – Workshop 1												
3.2 Ongoing systematization of the information collected – Workshop 2												
3.3 Development and dissemination of a technical newsletter on plantation progress - Workshop 3												
FINAL REPORT												

3.4.1 Master budget schedule by activity

Table 7. Activity-based budget - Master schedule

Item	ITTO	EA	LOCAL CONSULTANTS	TECHNICAL ASSISTANTS	FIELD WORKERS	TECHNICAL ASSISTANTS	FIELD WORKERS	DSA	AIR TRAVEL	LAND TRANSPORT	WORKSH OPS	IRRIGATION EQUIPMENT	IRRIGATION MATERIALS	AGRIC. INPUTS	TOTAL
OVERALL EXPENSES															
Project Coordinator/Director	72,000.00														72,000.00
Accountant	18,000.00														18,000.00
Financial Audits	8,000.00														8,000.00
Technical Committee expenses	12,000.00														12,000.00
ITTO-Monitoring and administration	15,000.00														15,000.00
ITTO - Programme support (12% of budget)	53,016.00														53,016.00
Land cost		250,000.00													250,000.00
Irrigation water cost		50,000.00													50,000.00
EA Management Costs		129,572.42													129,572.42
Sub Total (Overall expenses)	178,016.00	429,572.42													607,588.42
ACTIVITY-BASED EXPENSES															-
1.1 Identification, development and organization of a business and community interest group for the planting of experimental commercial Caoba stands	7,600.00			4,000.00		4,000.00		1,200.00	1,200.00	1,200.00					7,600.00
1.2 Planning and organization of work plan	8,000.00		6,000.00						800	1,200.00					8,000.00
1.3 Development of protocols and terms of reference for technical and administrative activities		4,000.00	4,000.00												4,000.00
2.1 Selection of 10 sites and qualified stakeholders for the establishment of 5-ha stands and establishment of nursery for the production of 60,000 Caoba seedlings	12,400.00		6,000.00	4,000.00		4,000.00		1,200.00	600	600					12,400.00
2.2 Establishment of nursery for the production of 60,000 Caoba seedlings	17,600.00					6,000.00	4,000.00	7,600.00							17,600.00
2.3 Planting of 10 5-hectare stands amounting to a total 50.0 hectares of Caoba planted under a drip irrigation system	221,200.00	65,000.00	12,000.00			6,000.00	74,000.00		1,200.00	3,000.00		15,000.00	125,000.00	50,000.00	286,200.00
2.4 Development of a technical information handbook for the dissemination of plantation results	4,000.00			6,000.00		4,000.00									4,000.00
2.5 Regular monitoring and technical and economic evaluation of all activities	18,000.00			12,000.00		12,000.00		3,000.00		3,000.00					18,000.00
3.1 Workshop 1 Organization of interest group, participation rules, technical, logistical and administrative issues	8,000.00										8,000.00				8,000.00
3.2 Workshop 2. Plantation management, follow-up and monitoring of field activities, economic control matrix	8,000.00										8,000.00				8,000.00
3.3 Workshop 3. Final validation of the information gathered for the development of a technical handbook	12,000.00										12,000.00				12,000.00
TOTAL	316,800.00	69,000.00	28,000.00	26,000.00	0.00	36,000.00	78,000.00	13,000.00	3,800.00	9,000.00	28,000.00	15,000.00	125,000.00	50,000.00	385,800.00
ITTO TOTAL	494,816.00	498,572.42	28,000.00	26,000.00	0.00	36,000.00	78,000.00	13,000.00	3,800.00	9,000.00	28,000.00	15,000.00	125,000.00	50,000.00	993,388.42

3.4.2 Budget by component

Table 8. Budget by component

Item	Description	B	C	D	E	ITTO	EXECUTING AGENCY
		Unit	Total qty	Unit cost	TOTAL		
11.1	Project Coordinator/Director	month	36	2,000.00	72,000.00	72,000.00	
11.2	Accountant	month	36	500	18,000.00	18,000.00	
11.4	Local consultants	month	7	4,000.00	28,000.00	28,000.00	
12.1	Technical assistants	month	36	1,000.00	36,000.00	36,000.00	
12.2	Field workers	day	3,900.00	20	78,000.00	24,000.00	54,000.00
12.5	Technical Committee	quarter	4	3000	12,000.00	12,000.00	
SUB-TOTAL					244,000.00	190,000.00	54,000.00
15.1	Workshop 1 1:Identification of stakeholders and plantation sites	unit	1	8,000.00	8,000.00	8,000.00	
15.2	Workshop 2 : Database development	unit	1	8,000.00	8,000.00	8,000.00	
15.3	Workshop 3: Regional validation of results	unit	1	12,000.00	12,000.00	12,000.00	
SUB-TOTAL					28,000.00	28,000.00	
31.1	DSA	day	130	100	13,000.00	13,000.00	
33.1	Local air travel	unit	19	200	3,800.00	3,800.00	
33.2	Local land travel	unit	180	50	9,000.00	9,000.00	
SUB-TOTAL					25,800.00	25,800.00	
44.1	Irrigation materials				125,000.00	125,000.00	
44.2	Irrigation equipment	unit			15,000.00		15,000.00
44.3	Agricultural inputs				50,000.00	50,000.00	
44.4	Capital items (50 ha of land for plantations)				250,000.00		250,000.00
44.5	Irrigation water	m ³	50,000.00	0.1	50,000.00		50,000.00
SUB-TOTAL					490,000.00	175,000.00	315,000.00
62	Financial audits	unit	8,000.00	1	8,000.00	8,000.00	
SUB-TOTAL					8,000.00	8,000.00	
SUB-TOTAL (Activities)					795,800.00	426,800.00	369,000.00
81	PROJECT MONITORING AND REVIEW (ITTO staff participation in three PSC meetings)		3	5,000.00	15,000.00	15,000.00	3
82	ITTO Programme Support (12% of ITTO's budget)				53,016.00	53,016.00	
83	EA Management costs (15% of total budget)				129,572.42		129,572.42
SUB-TOTAL (Monitoring and Administration)					197,588.42	68,016.00	129,572.42
100	TOTAL PROJECT BUDGET				993,388.42	494,816.00	498,572.42

3.5 Assumptions, risks and sustainability

3.5.1 Assumptions and risks

The project will start upon the first disbursement of ITTO funds, following the submission of the inception report and an updated work plan.

Desk research and interviews will be conducted partly online, with reasonable travel to key locations in the country. Contacts between consultants and relevant stakeholders will be facilitated and coordinated through existing links with administrative bodies in selected areas and other groups as recommended by the stakeholders involved in project implementation.

Overall, the project does not pose 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 highly degraded ecosystems that would otherwise be irreversibly lost. In this respect, the project can only bring multiple benefits. However, when assessing areas planted or suitable for reforestation, the project must take serious account of the need to avoid conflict with existing natural ecosystems, particularly dry forest formations with a significant presence of valuable native species.

There is always a potential risk of extreme droughts affecting the region, but this problem could be reversed by providing adequate water reservoirs for drip irrigation. Another problem could be insect infestation, but pest control is an important part of the Caoba propagation strategy.

An additional risk is that illegal logging in the Amazon region will persist despite *ex-situ* Caoba plantations. However, the project aims to work together with governmental organizations to address this issue by promoting better conditions for Caoba timber supply in the northern coastal region.

All of this is based on the assumption that subsequent government administrations will continue to give the same or even greater importance and political support to the rehabilitation of degraded lands and reforestation in the coastal region of Peru.

3.5.2 Sustainability

The project will be implemented within the framework of the national land restoration and rehabilitation program and the national forest plantation plan, which are national policies. This will ensure the sustainability of the project, with the government's commitment to promote and develop degraded land restoration programs throughout the country, as set out in the international agreement that framed the 20x20 Initiative.

In addition, the project outputs i.e. the technology package and guidelines on sustainable forest management and land rehabilitation, will be policy tools ready for implementation in the field, although they may be subject to future revisions and/or improvements to keep them up to date.

A key component of the project is the training of beneficiaries and users in general in forest plantations on the Peruvian coast, which will ensure that all participants have the conditions necessary to continue activities beyond the operational life of the project. In addition, the investments to be made by participating private companies and communities are a guarantee of continuity.

PART 4. IMPLEMENTATION ARRANGEMENTS

4.1 Organization structure and stakeholder involvement mechanisms

4.1.1 Executing Agency and Steering Committee

The project will be managed by the NGO *Costa Verde Iniciativa 20x20*, an institution of high national and international standing, and the Project Coordinator will be responsible for the technical implementation of the project.

This organization has more than 20 years of experience working in the semi-arid region of Peru, engaging in a variety of project activities in the field, such as dry forest stock and biodiversity assessment, reforestation and agroforestry in this region, and implementation of several projects with financial support from ITTO, as well as the Ministry of Agriculture and Irrigation, APFNet, the Asia-Pacific Forestry Network (IPSI), and other national and international organizations.

Costa Verde's main objective is to promote the conservation, restoration and rehabilitation of biodiversity in degraded ecosystems and barren lands in the semi-arid region of Peru.

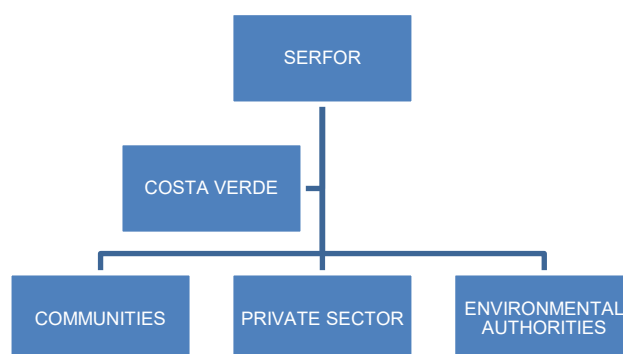
Participating bodies:

SERFOR, as the national forest and wildlife authority, will be responsible for monitoring and supervising project operations and will chair the project's Steering Committee.

Private companies and rural communities involved in the project will participate as co-financers of the project and will play an active role in the Steering Committee.

The Project Steering Committee will be the highest authority in the project's policy and administrative structure and will be made up of a representative from ITTO, a representative from SERFOR (MIDAGRI), a representative from the executing agency (Costa Verde), and a representative from the Regional Government of Lambayeque.

The committee will meet twice a year to review project progress and provide guidance for improving project implementation, and a second time at the end of the project. The technical committee will be the highest authority on the technical implementation of the project and will be responsible for monitoring, evaluating, proposing improvements or solutions, and making decisions on project implementation. This committee will also be responsible for preparing all technical and financial reports, managing project staff, and other tasks or activities as required.



4.1.2 Project Technical Committee

At the same time, a Project Technical Committee (PTC) will be set up to support the Project Steering Committee (PSC), particularly in relation to field work. This Committee will provide technical support to the PSC, especially for the implementation of field activities. It will be a permanent body and will be made up of the Project Coordinator, a representative from INIA (National Institute of Agricultural Research of Lambayeque), a representative from UNALM's Faculty of Forestry, and a representative from the private sector. Its activities will be carried out through field visits and virtual meetings, and it will be required to produce technical reports on the progress of project activities on a quarterly basis.

4.2 Reporting, monitoring and evaluation

Project progress and completion reports

At project start-up, 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 applicable to ITTO projects. A project completion report and a final financial audit report shall be submitted within 3 months and 4 months after the end of the 12-month implementation period, respectively.

4.3 Dissemination and mainstreaming of project learning

The main objective of the project is to generate knowledge and capacity among users and the general public about the advantages of forest plantations on the Peruvian coast and to disseminate practices, experiences, and results using conventional media and social networks, so that forest plantations can be replicated and expanded. The workshops and training courses to be organized will also aim to disseminate planting and management techniques as widely as possible, detailing the comparative advantages of forest plantations.

Where feasible, outreach brochures will be prepared and distributed as widely as possible.

ANNEXES

ANNEX 1: Profile of the Executing Agency

1. Background

COSTA VERDE INITIATIVA 20X20, FOUNDED IN 2007, IS A NON-PROFIT CIVIL ASSOCIATION WITH NO POLITICAL OR RELIGIOUS AFFILIATIONS, GOVERNED BY THE PRESENT STATUTES, TITLE II, SECTION II, OF BOOK I OF THE PERUVIAN CIVIL CODE AND OTHER APPLICABLE LEGAL PROVISIONS IN FORCE, AND SHALL ALSO BE SUBJECT TO THE COURTS OF PERU.

2. Mission

THE MAIN ACTIVITIES CARRIED OUT TO ACHIEVE ITS OBJECTIVES ARE DETAILED BELOW:

- 2-1. PROMOTE AND MANAGE INTERNATIONAL TECHNICAL AND FINANCIAL COOPERATION ACTIVITIES FOR HOLISTIC AND SUSTAINABLE HUMAN DEVELOPMENT IN PERU IN THE CONTEXT OF CLIMATE CHANGE AND DEGRADED FOREST LANDSCAPE RESTORATION.
- 2-2. DEVELOP PROJECTS, PROVIDE CONSULTING OR ADVISORY SERVICES AND, IN GENERAL, ESTABLISH ALL KINDS OF COOPERATION AND COLLABORATION LINKS, IN ACCORDANCE WITH THE LAW, WITH NATIONAL OR FOREIGN PUBLIC AND/OR PRIVATE ENTITIES THAT CONTRIBUTE TO THE FULFILLMENT OF ITS GOALS.
- 2-3. PROVIDE TRAINING, ADVISORY SERVICES AND CAPACITY-BUILDING FOR PROFESSIONAL AND BUSINESS ASSOCIATIONS LINKED TO THE FORESTRY, AGROFORESTRY, AGRICULTURE, EDUCATION, AND ENVIRONMENTAL SECTORS IN PERU, CONTRIBUTING TO THE IMPROVEMENT OF LIVING CONDITIONS FOR THE GENERAL POPULATION.
- 2-4. CONTRIBUTE TO THE EDUCATION AND TRAINING OF ADULTS IN THE USE OF NEW TECHNOLOGIES IN ORDER TO INCREASE THEIR EMPLOYABILITY BY IMPROVING THEIR PROFESSIONAL QUALIFICATIONS, INCLUDING FOR UNEMPLOYED OR INACTIVE OLDER PEOPLE AND PEOPLE WITH DISABILITIES.
- 2-5. ORGANIZE AND DISSEMINATE STUDIES AND RESEARCH RELATED TO PUBLIC ADMINISTRATION REFORM, STATE MODERNIZATION, DECENTRALIZATION, LOCAL GOVERNMENTS, TRANSPARENCY IN PUBLIC MANAGEMENT, GOVERNANCE, CITIZEN PARTICIPATION, GENDER ISSUES, AND THE FIGHT AGAINST CORRUPTION AND OTHER ISSUES.

3. Experience

SINCE ITS FOUNDATION, COSTA VERDE HAS BEEN VERY ACTIVE IN IMPLEMENTING PROJECTS, STUDIES, RESEARCH, AND PROMOTION OF SYSTEMS FOR THE RESTORATION AND REHABILITATION OF DEGRADED ECOSYSTEMS, ESPECIALLY IN THE DFE REGION OF THE SOUTHERN COAST OF PERU, HAVING CARRIED OUT A VARIETY OF PROJECTS WITH NATIONAL AND INTERNATIONAL AGENCIES, SUCH AS ITTO PROJECTS PD 724/14 (F) AND PD 852/17 Rev. 4 (F), PROJECTS FOR THE PLANTING OF TARA (*Caesalpinea spinosa*) IN THE CAMANÁ DESERT, A STUDY OF THE BIODIVERSITY OF LOMAS DE ATIQUIPA WITH IPSI, AS WELL AS PARTICIPATION IN MANY NATIONAL AND INTERNATIONAL EVENTS RELATED TO THE ENVIRONMENT, THE FOREST SECTOR, AND CLIMATE CHANGE.

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 staff and consultants to be funded by ITTO

PROJECT COORDINATOR / DIRECTOR

Forestry professional with extensive experience in project administration, forest management, land-use management and field production activities.

Main duties:

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

Duration: 12 months

ACCOUNTANT (Part-time)

Accounting professional with at least 3 years of experience in project account management.

Main duties:

- Project bookkeeping, including contributions from ITTO and the executing agency, the co-executing agency and other sources.
- Prepare monthly accounting reports to be submitted to ITTO through the ITTO online monitoring system.
- Attend Steering Committee meetings to report on and/or clarify project financial and economic issues as required.

Duration: Throughout the 12 months of the project implementation period.

LOCAL CONSULTANTS AND TECHNICAL ASSISTANTS (short-term assignments, according to project activities and needs)

Local consultants: Forestry professionals, 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 outputs 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: 1 to 6 months as required to meet project needs and in accordance with the schedule of activities and budget availability.

Technical assistants: Young professionals or final-year university students in forestry and other related fields.

Main duties:

- Assist the local consultants and the project coordinator in organizing the different activities of the work plan.
- Collect information in the field and in the office (libraries).
- Assist in stakeholder interviews.

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

ANNEX 3: Caoba (*Swietenia macrophylla* King) technical fact sheet

Tree factsheet

Swietenia macrophylla King

Martha Chaves, edited by Leo Goudzwaard

taxonomy	
author, year	King, 1886
synonym	<i>Swietenia candollei</i> Pittier ; <i>Swietenia tessmannii</i> Harms ; <i>Swietenia krukovi</i> Gleason ; <i>Swietenia belizensis</i> Lundell ; <i>Swietenia macrophylla</i> var. <i>marabaensis</i> Ledoux & Lobato.
family	Meliaceae
Eng. Name	Big-leaf mahogany; Honduras mahogany
other names	aguano, mogno, caoba
Dutch name	Honduras mahonie
subspecies	
varieties	<i>S. humilis</i> proposed as an ecotype by Helgason et al. 1996
hybrids	Hybrids of <i>S. humilis</i> x <i>S. macrophylla</i> (Costa Rica); <i>S. mahagoni</i> x <i>S. macrophylla</i> (Caribbean islands)
references	
	CAB International. 2005. The Forestry Compendium. www.cabcompendium.org/1c
	Conabio. www.conabio.gob.mx/conocimiento/info_especies/arboles/doctos/37-melia5m.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 silviculture 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 or 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 axillary 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 becoming 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 depend 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-transpiration 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: <i>Botryodiplodia theobromae</i> (stem rot), <i>Corticium koleroga</i> (thread blight), <i>Fusarium</i> spp. (damping-off fungus), <i>Pellicularia</i> spp. (thread blight), <i>Rhizoctonia solani</i> (damping-off fungus), <i>Sclerotium</i> spp.

insects	Young trees attacked by the shoot borer <i>Hypsipyla grandella</i> (common pest). Other pests reported affecting seedlings in nurseries are: <i>Acrocerops auricilla</i> (leaf miner), <i>Diaprepes abbreviatus</i> (sugarcan weevil), <i>Helopittis antonii</i> (leaf bug), <i>Xyleborus abrup-toides</i> and <i>X. caffeeae</i> (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 panelling, 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 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. Response to Expert Panel's comments and recommendations

RECOMMENDATION No. 1: In Section 3.2 Work Plan, clarify the difference between "Technical Information Guide" under Activity 2.3 and "development of a technical handbook" under Activity 3.3.

Solution:

In fact, both cases involve the preparation of a technical manual. In activity 2.3, the word "handbook" has been removed to avoid any confusion. Consequently, activity 2.3 now reads as follows:

2.3 Development of a technical information handbook for the dissemination of plantation results

And OUTPUT 3 reads as follows: "TRAINING OF STAKEHOLDERS AND BENEFICIARIES" with the following corresponding activities:

3.1 Workshop 1 Organization of interest group, participation rules, technical, logistical and administrative issues

3.2 Workshop 2. Plantation management, follow-up and monitoring of field activities, economic control matrix

In addition, the text has been improved and the activities and their numbering have been organized.

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COMMENT No. 2: In Section 4.1.3 Project Steering Committee (PSC), given the technical nature of the project, establish a Project Technical Committee (PTC) that supports the conduct of the PSC with technical information as well as field data information. Technical committee task will include field trip to project site.

Solution:

Item 4.1.2 has been added as follows:

"At the same time, a Project Technical Committee (PTC) will be set up to support the Project Steering Committee (PSC), particularly in relation to field work. This Committee will provide technical support to the PSC, especially for the implementation of field activities. It will be a permanent body and will be made up of the Project Coordinator, a representative from INIA (National Institute of Agricultural Research of Lambayeque), a representative from UNALM's Faculty of Forestry, and a representative from the private sector. Its activities will be carried out through field visits and virtual meetings, and it will be required to produce technical reports on the progress of project activities on a quarterly basis."

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A total of US\$12,000.00 has been added to the ITTO budget, considering US\$4,000.00 per year for travel costs and expenses for this Committee, and revisions and total adjustments have been made to the budget tables, resulting in a total of USD 494,816.00 for ITTO, USD 498,752.42 for counterpart funding, and a grand total of USD 993,388.52 for the overall project budget.

EXCEL budget tables are attached separately in editable format.

COMMENT No. 3

Referring to the attached ITTO environmental and social screening checklist questionnaire, amend the project proposal as necessary, particularly in Principle 5 Section: Security of tenure to forest land and access to forest resources.

Solution:

Item 1.3.1.1 has been added to address potential land-use conflicts as follows:

"As is the case throughout the country, land that is not formally designated for a specific use, in accordance with the National Land Classification Regulations and the national forest zoning program, is effectively available to third parties, and this is where most conflicts over land use and tenure arise. In the Department of Lambayeque, nearly 80% of the land is owned by rural communities, and land

used for industrial crops that was originally classified as forest land has been granted change of use authorization by the national forest authority.

“In any case, the selection of sites for the plantations planned in this project is within the lands officially assigned to private companies or rural communities, so it is understood that there will be no conflicts of use in any of the cases. In any event, the project will take the necessary precautions to ensure that this does not occur, considering this a priority issue.”

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