INTERNATIONAL TROPICAL TIMBER ORGANIZATION

ITTO

PROJECT DOCUMENT

TITLE:	PROMOTING THE REHABILITATION, MANAGEMENT AND SUSTAINABLE USE OF TROPICAL BAMBOO FORESTS IN THE NORTH-WESTERN REGION OF PERU
SERIAL NUMBER:	PD 428/06 Rev.2 (F)
COMMITTEE:	REFORESTATION AND FOREST MANAGEMENT
SUBMITTED BY:	GOVERNMENT OF PERU
ORIGINAL LANGUAGE:	SPANISH

SUMMARY

This project proposal has been developed in response to the requirements of the national competent authority in the field of natural resources and of small producers and local leaders from the north-western region of Peru. Its main objective is to ensure the rehabilitation and sustainable management and utilization of degraded or endangered tropical forests with bamboo stands and effectively contribute to poverty alleviation in an area with a high level of unmet basic needs (an average of 62% of the population is classified as poor) and hence with a high level of deforestation (185,000 ha/year) in Peru. Thus, it is expected to restore degraded forest soils, improve environmental conditions in general, and provide sustainably harvested raw materials for their direct use or their processing into quality handicraft products. The native communities and poor rural populations will be the main beneficiaries of this project, as their income levels will increase through the sale of sustainably harvested and used products.

Demonstration plots will be selected and established through a broad-based participatory process in order to provide training to poverty-stricken rural communities in intermediate techniques for the rehabilitation of degraded forests, management of forests with bamboo stands, implementation of forest nurseries, and drying and preservation of bamboo culms. A pilot centre will be established for the handcrafted manufacturing of bamboo products of competitive commercial quality by local communities participating in the respective production chains.

EXECUTING AGENCY:	PERUVIAN ASSOCIATION FOR BAMBOO – PERUBAMBU in cooperation with the NATIONAL INSTITUTE FOR NATURAL RESOURCES – INRENA
COOPERATING GOVERNMENTS:	---
DURATION:	36 MONTHS
APPROXIMATE STARTING DATE:	UPON APPROVAL

BUDGET AND PROPOSED SOURCES OF FINANCE:

Source	Contribution in US$
ITTO	**502,978**
GOVERNMENT OF PERU	140,000
PERUBAMBU	146,400
TOTAL	**789,378**

ABBREVIATIONS

ADEX	Asociación de Exportadores (Exporters' Association)
AG	Agriculture
CITE	Centro de Innovación Tecnológica (Technological Innovation Centre)
FTA	Free Trade Agreement
GIS	Geographic Information System
INBAR	International Network for Bamboo and Rattan
INRENA	National Institute for Natural Resources
ITTC	International Tropical Timber Council
ITTO	International Tropical Timber Organization
LFFS	Forestry and Wildlife Law No. 27308
MINAG	Ministerio de Agricultura (Ministry of Agriculture)
MINCABAMBU	Mini Bamboo Crafts Centre
NC	Native community
NGO	Non-governmental organisation
NTFP	Non-timber forest product
PERUBAMBU	Asociación Peruana del Bambú (Peruvian Association for Bamboo)
PEU	Project Executing Unit
PRODUCE	Ministerio de la Producción (Ministry of Production)
PROMPEX	Comisión para la promoción de las exportaciones (Commission for the Promotion of Exports)
SD	Supreme Decree
SR	Supreme Resolution
SUNAD	Superintendencia Nacional de Aduanas (National Customs Authority)
TUUA	Tarifa Unificada de Uso de Aeropuerto (Consolidated Airport Tax)
URKU	URKU Estudios Amazónicos (URKU Amazon Studies)

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PART I: CONTEXT

1. BACKGROUND

Bamboo is a non-timber forest product (NTFP) found in many areas of the country. It is distributed in varying densities (10 – 50%), mainly throughout the extensive primary forests of difficult access found in Ucayali (19,035 km^2), Madre de Dios (16,114 km^2), Cusco (3,868 km^2) and Junin (960 km^2). Bamboo resources are also found in large areas of the Valleys of Ceja de Selva and Selva Alta in the nothern (San Martín, Amazonas, Cajamarca, Piura and Lambayeque) and central (Huanuco and Pasco) regions of the country, and to a lesser extent in some valley areas of the northern and central coastal region of Peru, where harvesting under no management plans and with no value added threatens the sustainability of tropical forests, hence their limited contribution to the local economy.

Bamboo grows from sea level to 4000 m.a.s.l.. A total of 8 genera and 40 species of bamboo have been identified, including *Ch. aspera; Ch. polyclados; Ch. scandes; Ch. serrulata; Ch. peruviana; Ch. tessellata; Apoclada sp.; Aulonemia haenkei; A. queko; A. parviflora; A. hirsuta; A. longiaristata; Elytrostachys sp.; Neurolepsis weberbaueri; Ripidocladum harmonicum; Guadua sarcocarpa; G. paniculata; G. aff. angustifolia; G. superba; G. weberbauri*; *Rhipidocladum* sp., in addition to several introduced species (See Annex 1: Map of Bamboo Distribution in Peru). Some of these species have formed special ecosystems which support endangered endemic bird and mammal species, such as the grey-headed ant-eater (*Myrmeciza griseiceps*), "Incan cockroach trapper" (*Thryothorus eisenmanni)* and "hemispingo parodi" (*Hemispingus parodii)*, as well as endemic birds associated to *Chusquea* sp., *Aulonemia queko* and *Guadua* spp. forests.

Native and introduced species with greatest potential in the project area include: *Guadua affin angustifolia*, *Guadua sarcocarpa spp purpurea*, *Guadua weberbaueri*, *Chusquea* sp. *Neurolepsis weberbaueri*, *Rhipidocladium racemiflorum*, *Bambusa vulgaris* and *Bambusa tulda*.

The first signs of bamboo utilisation in this continent date back to more than 8,000 years ago, with evidence of bamboo use found in construction and in the manufacturing of various products in the peoples of Chavin de Huantar, Moche and Paracas. Nowadays, it is mostly used for the construction of housing and the manufacturing of furniture and household products. In all cases, bamboo is used with limited basic technological knowledge and limited value added to the resource.

Bamboo resources are a key element in the construction sector. Since colonial times, bamboo has been used in the construction of churches and houses, to build walls (quincha) and subsequently to reinforce concrete given the breaking strength (1,800 to 2,700 lb/p^2) shown by the "marona" species (*G. affin angustifolia* and *G. angustifolia*) (or "Guayaquil cane"), as well as in the furniture industry, in the manufacturing of exclusive products made of *Ch. coleou* imported from Chile and geared to the middle and upper class markets. However, no evidence has been found of the commercial production of furniture and other products with Peruvian native bamboo species. The export of these products is negligible and their contribution to the economy is very limited.

The Global Partnership Programme[1] on Non-Timber Forest Products for the Basic Development of Rural Communities, based on economically, socially and environmentally sustainable solutions, considers bamboo as a priority resource, having been listed in second place among the top ten (10) non-timber forest products that because of their potential may alleviate the world's poverty and should therefore receive increased financial support.

At the global level, more than one billion people live in bamboo houses and more than two billion dollars are generated through foreign trade in bamboo products such as construction components, furniture, household and office utensils and fixtures, textile fibres, fungicides and bactericides for the agricultural, pharmaceutical and cosmetics sectors, and filters for the mining sector.

A project on "Paca (*Guadua sarcocarpa*) Management and Utilisation" (PD 2/98 Rev.2 (F,I) was implemented in Iñapari (Madre de Dios) with financial support from ITTO and the Government of Peru. **Some of the most important outputs of this project include:**

[1] Global Partnership Programme – GPP, Marrakech Workshop 30 - 11 - 2005.

1. Establishment of an experimental model for the sustainable management and harvesting of "Paca" in a 2000 ha concession, where a comprehensive evaluation of bamboo stands in this region was carried out assessing their potential, particularly in identified associations with a predominance of *Guadua sarcocarpa, G. weberbaueri (Paca) and G.affin angustifolia (Marona)* species, which are the most abundant species and can be found in concentrations of up to 15.3 m^3/ha, with an average of 2,186 culms/ha. This activity has led to the compilation of regional information on the Guadua genus and to the formulation of a Management Plan which constitutes an important reference point for the formulation of bamboo technical fact sheets and management plans in other regions of the country.
2. Promotion and training on the management and utlization of "Paca". Promotional activities were implemented in the Madre de Dios region and in neighbouring countries, as the Project's team of professionals and technical staff (second team) participated in trade fairs and specialized workshops in Ecuador, Brazil and Bolivia.
3. Construction and fitting out of pilot plant for the processing of "Paca" handicrafts and industrial products.
4. The project also launched a training program for the local communities on basic bamboo propagation, management and primary processing techniques, aimed at ensuring that the local communities and local authorities are aware of and value the environmental and economic potential of bamboo, turning the area into a promotion and training centre in bamboo management and processing for the many new communities who are settling along the so called "trans-ocean roadway", which links Brazil to the south Pacific coast, with the resulting environmental impact in the immediate surroundings of this region.

However, the experiences or factors that had a negative impact on the smooth implementation and, consequently, on the full achievement of the objectives of Project PD 2/98 Rev.2 (F,I) should be taken into consideration when formulating strategies for the implementation of similar projects, the most important being the following:

- Deficiencies in the physical and biological diagnosis of the project's area of influence (location of bamboo forests, taxonomy, etc.) for the project design and start-up phases.
- Acquisition of machinery and equipment with a level of complexity and characteristics that were far superior to the existing general infrastructure and biological resources in the region, as well as limited technical capacity of direct project beneficiaries.
- Insufficient budget to carry out training and institutional strengthening activities for project beneficiaries.
- Changes in Government half way through the Project's implementation period resulted in changes to the INRENA management and the Project Implementation Unit (PIU) staff, who had been trained in Colombia and China in bamboo management and processing techniques. The people who replaced them participated in workshops and related events, but did not take part in specialized courses in these areas.
- Poor communication and identification between the members of the PIU and INRENA (the institution to which they belonged) and a very low level of coordination with their head-office counterparts, resulting in delays in meeting the project's financial and technical and administrative support requirements.
- Delays in the implementation of specialized consultancies, such as those of international experts: Ximena Londono (taxonomy) and Jorge Moran (bamboo construction), which were only finalised in the last year of project implementation[2], with the resulting delays to the implementation of some of the project activities.
- The area that had been selected by the project for the management of bamboo was located more than 180 km from project headquarters and was only accessible by pedestrian trails or by river, thus limiting the implementation of training and harvesting activities. Furthermore, it did not meet the legal requirements needed for harvesting in that area and this resulted in long and complicated procedures for approvals, thus delaying the implementation of this project component.
- Insufficient technical-legal support for the organization of direct project beneficiaries prevented the transfer of infrastructure and equipment by INRENA as planned.
- Increases in the demand and prices in the international market for valuable timber species, especially for "mahogany" *Swietenia macrophylla*, which is commonly found in the project area, diverted the attention of locals (mainly migrants from the Andean region) to the

[2] Report of the visit to the Paca project, July 1-11, 2001.

exploitation of this timber resource or prompted them to take part in conflicts promoted by interests of third parties.

- Weak level of commitment by the local and regional authorities with project objectives, accentuated by the aforementioned timber problem.

The information and knowledge gained from these negative experiences together with the positive results obtained by Project PD 2/98 Rev.2 (F,I) have been extremely important in the formulation of the strategy for this project (section 2.3). The project strategy has been formulated on the basis of: the compilation of detailed geographic information, through both office and field based studies; the active participation of local communities (mainly native communities), local and regional authorities and professionals; the identification of native communities with bamboo forests who were interested in the sustainable management and utilization of their forests; the evaluation of the social and economic characteristics of the area of influence in general; the identification of the basic equipment required for the pilot processing centre using primary techniques; the strengthening of strategic partnerships with different stakeholders carrying out activities in these areas and/or willing to participate in ensuring their sustainability; and the commitment of sectoral authorities, regional governments and local authorities to support the implementation of the project and participate by providing support in terms of infrastructure, human resources and indirect financial resources.

The Peruvian Government promotes the sustainable utilisation of forest resources and their industrial and non-industrial processing, particularly when these activities are aimed at generating increased employment and sustainable socioeconomic development for poor rural communities. However, more financial and technological resources are needed to have a significant socioeconomic and environmental impact so as to benefit the majority of the most disadvantaged communities in the country.

There is currently a significant number of forest concessions for timber production purposes which cover areas with large bamboo concentrations, but unfortunately these resources are not adequately harvested due to the lack of knowledge of both forest concession holders and local communities on management techniques for the use of timber and non-timber resources, including bamboo, despite the growing demand for the latter.

Over the last few years, there has been an increase in the use of bamboo as a structural and decorative component in the construction of upper middle class housing. This is a significant factor that should be used for the promotion of bamboo resources and their incorporation into social housing construction programmes for low-cost earthquake resistant housing, especially in a country that is frequently affected by earthquakes.

In order to meet local market demand, over US$1 million in "Guayaquil cane" (*Guadua angustifolia*) is imported from Ecuador and a lower volume of *Chusquea coleou* from Chile. In both cases, variations in availability and resource quality in the country of origin lead to variable results in product performance for construction and production of quality furniture, which has a negative impact on the country's industrial development.

Bamboo products, with a growing demand in the developed countries' market throughout the world, will have free access to the United States of America within the framework of the Free Trade Agreement (FTA). In this context, the country's existing large areas of natural and planted native and introduced bamboo stands become particularly important given their significant potential to contribute to socioeconomic development in Peru.

The Government Plan of Peru's President Elect for 2006-2011, in its Objective 4 on "Economics for Social Justice", section B: Agriculture and Rural Development, item 242, states the following: **"the promotion and development of bamboo plantations shall be declared as a priority of national interest".**

Against this background, this project proposal has been developed identifying the following as limiting factors in the mitigation of tropical forest degradation and alleviation of extreme poverty conditions of the population:

1. Limited or non-existing training and dissemination of intermediate techniques for tropical forest rehabilitation and reforestation;
2. Lack of training and promotion of know-how for the sustainable management and non-industrial processing of bamboo resources;

3. Almost complete lack of viable alternatives for sustainable socioeconomic development in the Amazon Region.

2. SECTORAL POLICIES

Over the last decade, the Government of Peru has given special priority to the sustainable management of tropical forests in consonance with ITTO's Objective 2000, incorporating in its Agenda 21 and national policies the commitment to establish mechanisms aimed at ensuring the sustainable development of rural communities through forest concessions and permits for the integrated utilisation of forest resources under management plans, as well as the promotion of afforestation and reforestation with timber and non-timber species for rehabilitation and land-use change in degraded areas. All of this is established in SD No. 003-2005-AG, stressing the importance of reforestation, and SR No. 002-2006-AG, approving the National Reforestation Plan.

There is a significant body of policies and legislation directly related to the management, harvesting and processing of forest products such as bamboo.

Forestry and Wildlife Law No. 27308 (LFFS) stipulates that forest resources are publicly owned and its regulations establish standards for their conservation and harvesting, and for the processing and marketing of by-products. According to Article 7 of the LFFS, forest resources in their source and both forested and unforested State-owned lands that are mainly suitable for forestry, are all part of the National Forest Heritage. They cannot be used for agricultural purposes or any other activities that may affect the vegetation cover and the sustainable use and conservation of forest resources, regardless of their location in the national territory, unless otherwise stated by the law and its regulations. The LFFS created the National Plan for Deforestation Prevention and Control in the Amazon Region. An important element of this Plan is the rehabilitation and management of protected, deforested and degraded areas, which are increasing in the high forest region of the north-west of the country. In this context, bamboo resources have a significant potential to contribute to the achievement of these objectives.

Sustainable Natural Resource Utilisation Law No. 126839 clearly establishes INRENA as the national forest authority responsible for the management and commercial harvesting of timber and non-timber resources, including bamboo from natural and planted forests.

Since bamboo is a NTFP, a permit from the relevant authority is required for its harvesting and utilisation. Reference is also made to forest product processing plants, which use as their main raw material forest products that are harvested in their natural state from primary forests or plantations. The implementation of these policies and regulations is based on the concept of sustainable use of resources[3] and on the recognition that these resources provide economic benefits to the communities that use them.

Policies for the internal regulation and control and international trade in bamboo products are established by S.D. No. 068-91-EF, which stipulates the total liberalisation of foreign trade operations, as well as SUNAD Resolution No. 1005 91-93, approving the manual of automated procedures for the Exports Regime.

The most significant legal instruments in this field, in order of importance, are as follows:

Political Constitution of Peru: establishes that renewable and non-renewable natural resources are part of the national heritage and it is the responsibility of the State to promote their preservation, conservation and rational and efficient management.

Environmental Code: establishes that both companies and individuals are required to use appropriate technologies; encourages the use of environmentally-friendly traditional technologies; promotes the conservation and use of genetic resources in their environment; and states the obligation of public and private institutions to promote and support technological research and development to assess the potential of natural resources and ensure their sustainable utilisation.

Sustainable Natural Resource Utilisation Law No. 126839: regulates the sustainable natural resource use regime, establishing the conditions and modalities of access for users.

[3] Regulations relating to bamboo need to be developed.

Biodiversity Conservation and Sustainable Use Law No. 26839: regulates the conservation of biodiversity and the sustainable use of its components in accordance with Article 68 of the Political Constitution of Peru. All principles and definitions of the Convention on Biological Diversity are applied within the scope of this law.

Forestry and Wildlife Law (No. 27308) – of 15 July 2000, recognises and regulates management practices for the utilisation of forest resources and promotes reforestation, afforestation and rehabilitation of degraded ecosystems with species that may contribute to the sustainable socioeconomic development of local communities, particularly in the struggle to alleviate poverty.

Regulations of the Forestry and Wildlife Law (SD No. 014-2001-AG): promote sustainable utilisation, afforestation and reforestation, and processing and marketing of forest resources.

National Reforestation Plan (SD No. 02-2006-AG): aimed at promoting forest plantations with timber and non-timber resources at the national level.

PART II: THE PROJECT

1. PROJECT OBJECTIVES

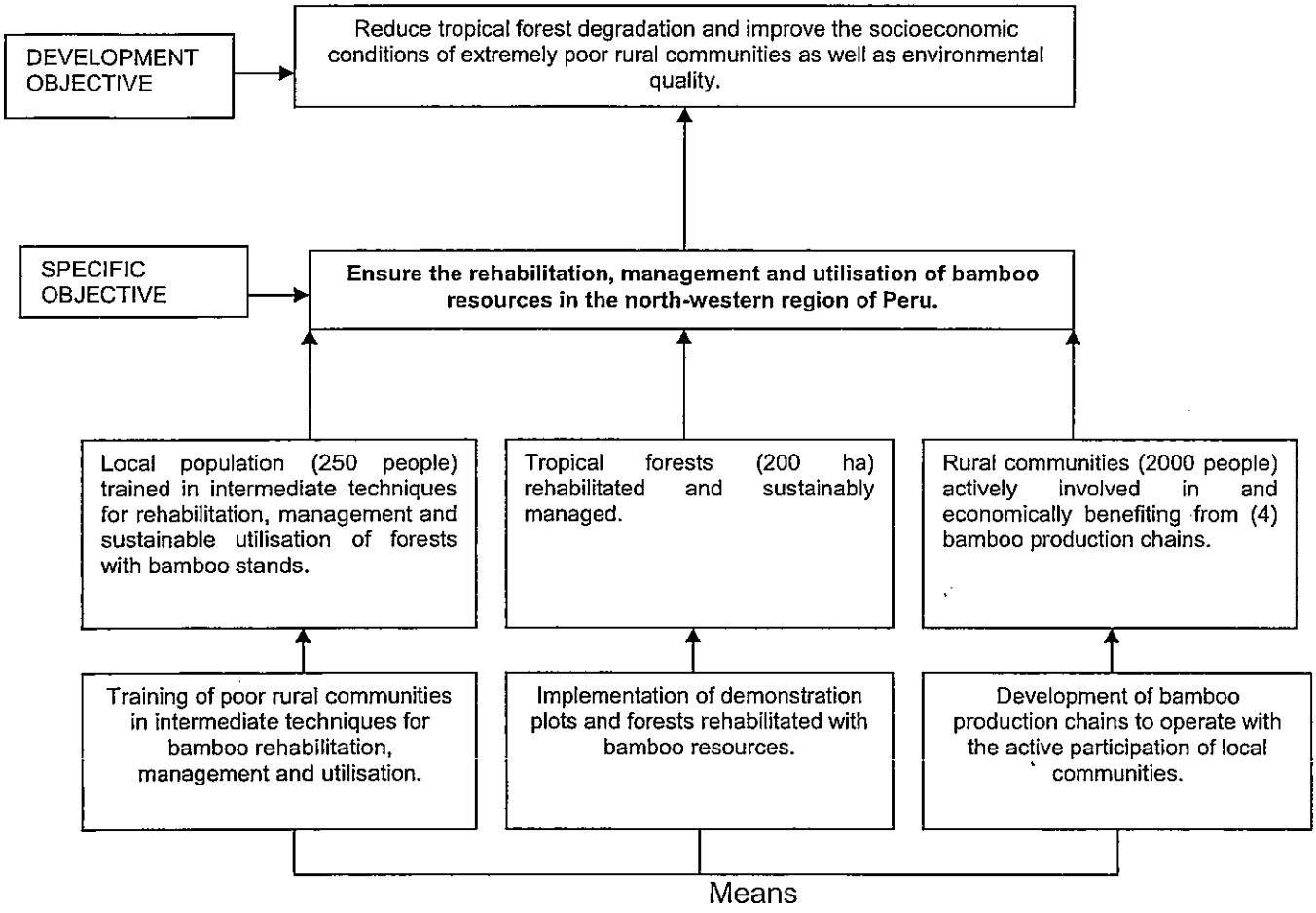
1.1 DEVELOPMENT OBJECTIVE

Reduce tropical forest degradation and improve the socioeconomic conditions of extremely poor rural communities as well as environmental quality.

1.2 SPECIFIC OBJECTIVE

Ensure the rehabilitation, management and sustainable utilisation of bamboo resources in the north-western region of Peru.

PROJECT OBJECTIVES TREE



2. JUSTIFICATION

2.1 JUSTIFICATION AND PROBLEMS TO BE ADDRESSED

Peru is a mega-diverse country with an area of 1,285,215.60 km^2 and a population of approximately 27,546,574[4], with approximately a third of the population living in rural areas in conditions that could be described as ranging from poverty to extreme poverty. These communities depend to a great extent on the harvesting of timber resources and subsistence agricultural activities, causing environmental degradation and, consequently, the deterioration of the quality of life of the communities themselves.

The main production activities of the communities living in the project area are agriculture (rice, corn, coffee and others) and timber logging, with very limited or no management or value-added processing activities being implemented. This contributes to a continuous increase in the deforestation rate, which is approximately 260,000 ha/year at the national level, or in other words, the equivalent of 0.45% of the total area of moist tropical forests in the country, causing the loss of biodiversity, soil degradation and a reduction of the quantity and quality of the water supply, among others. (See Annex 2 – Photos)

The forest concessions system that is being implemented in Peru in accordance with the legal framework that came into force in the year 2000, is heavily centred on timber harvesting activities, mainly of high commercial value forest species, which, because of the limited availability of these species in natural forests and their excessive logging, are seriously endangering the stability or economic viability of forest concessions.

However, the simultaneous harvesting of non-timber forest products, like for example bamboo (which is totally compatible in legal, technical and economic terms), will create very important alternative opportunities for the generation of skilled manpower and for a substantial improvement in the economic situation of the rural communities and in the sustainability of forest concessions in general.

The rapid depletion of tropical forests with bamboo stands, particularly in the easily accessible areas of the inter-Andean valleys of Selva Central (Central Forest Region) and the northern region of the country, where a high percentage of the local communities live in poverty conditions (mainly due to excessive extraction of resources using inappropriate harvesting methods), can be reversed with the implementation of a training program on intermediate forest rehabilitation and management techniques; which, considering the extent of the tropical forests found in the project's area of influence (66.3%), represents a very important activity both at the economic and environmental levels.

The increased use of bamboo in the country in semi-permanent constructions (fences, terrace roofs, etc.) and in the building and decoration of upper middle class housing, reinforces the need to have secure and permanent sources of raw materials sourced from managed areas, so as to ensure the sustainability of their harvesting and the development of the building industry, as both are important economic activities that can significantly contribute to the generation of employment and poverty alleviation.

In view of its widely recognised socioeconomic and environmental importance, and given that it has been clearly demonstrated that the propagation of bamboo is a relatively simple process and its non-industrial processing into quality products does not require complex technology or costly investments, it is imperative to promote the adaptation, and if necessary the improvement, of existing technologies developed in other countries.

Some of the key issues to be considered include the need for promotion and training in intermediate bamboo processing, for the handcrafted manufacturing of quality bamboo products in sufficient quantity and quality and with designs adapted to the dynamic changes of the national and international markets.

Several natural bamboo formations in the project area are also being eliminated as a result of an aggressive and irrational process that is being implemented for the expansion of the agricultural frontier[5]. However, there are still significant forest areas in good conservation status, especially in the territories of: the native communities of Huascayacu, San Rafael, Shanao, Chazuta, Shampuyacu, Alto Mayo, Bajo Naranjillo, Shimpiyacu, Morroyacu and El Dorado; the Associations for Agricultural Production

[4] INEI 2004

[5] Native community leaders and small-scale owners of areas with natural forests, rent out their lands for small cash payments. The forest mass is clear-cut to establish papaya plantations which when they lose productivity after 5 to 6 years, are abandoned so they can establish them elsewhere.

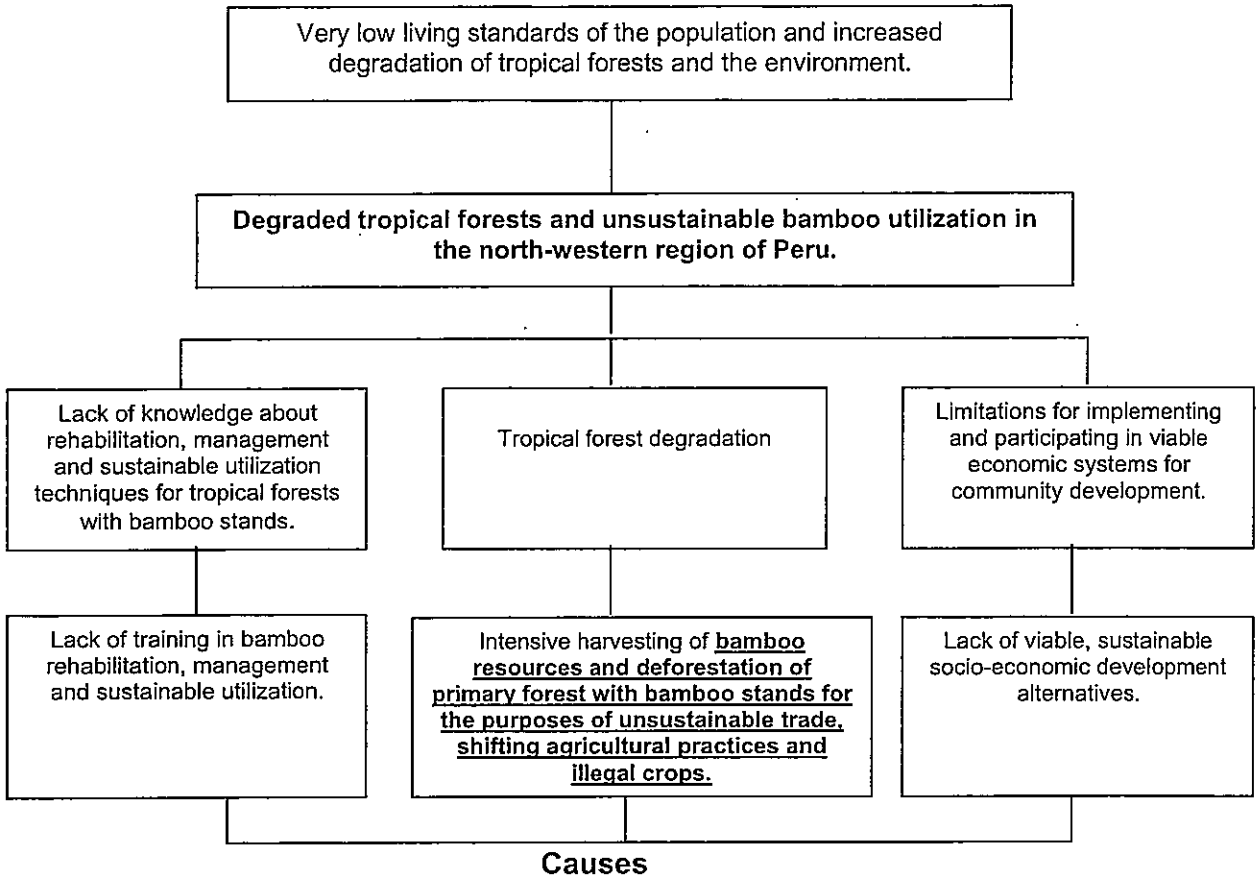
Development of the native community in the Monitor River sector and Agro-Ecological and Cattle Raising Producers; in the territories of the communities that make up the Ethnic Council of the Kechwas People of the Amazon Region, in the Department of San Martin in the Muyo region, and the communities of Nazaret, Wawas, Yupicusa and Huahuas in Bagua Chica-Amazonas; as well as the towns of Florida in Cajamarca and Tunal in Piura, where the local communities have been duly informed and motivated in relation to the project and have been pre-selected as project beneficiaries (See Annex 2 - Photos).

Because it is a perennial plant that is easily managed, bamboo constitutes a renewable natural resource of great potential, which trained local communities can easily use to rehabilitate degraded forests and can sustainably manage and utilise. However, the harvesting and sustainable use of bamboo, as with other highly heterogeneous tropical forest resources that are also found in the project area, will depend to a great extent on the value added that poor communities living in the area are able to give to the resources harvested from their forest.

The authorities and leaders of local private and public organizations, as well as a growing number of rural communities, in particular native communities living in the project area, have directly informed the members of PERUBAMBU or their strategic partners (INRENA and regional NGOs) about their interest in participating in a project that will provide them with the appropriate training to rehabilitate forests and sustainably manage and harvest bamboo resources. Furthermore, they have also expressed an interest in learning simple techniques to process bamboo into articles that can be introduced into the market. Because of their proximity and communication links with the valleys of the coastal region, where the "*Guayaquil cane*" is geared to, they are conscious of the fact that local bamboo resources could be a new income-generating alternative. However, they also recognise their technical limitations for the sustainable management and utilization of this species, because their current practices affect the sustainability of natural forests and the quality of the materials obtained, as has been the case in the current harvesting areas where the bamboo cover has been reduced, the quality of the culms is poor and the prices of products are low (See Annex 5).

Therefore, one of the actions required in the project area to improve the management of Amazon forest resources is to support the utilisation of bamboo from natural forests and/or plantations under sustainable management, with the use of appropriate technology for the production of quality handicraft products to meet the requirements of national and international markets, as proposed in this project. Thus, it will be possible to significantly contribute to the generation of employment and the improvement of economic incomes of the majority of rural communities living in poverty conditions, as well as curbing deforestation rates and impacts caused by the overexploitation of timber trees in fragile tropical montane forests.

PROBLEM TREE[6]



2.2 INTENDED SITUATION AFTER PROJECT COMPLETION

It is expected that this project will contribute to the implementation of sustainable management practices in natural and planted forests, the promotion of plantations and the efficient processing of bamboo, particularly in Ceja de Selva (moist hill forests) and Selva Alta (moist mountain forests) in the northern region of the country. The intended situation after project completion is, therefore, as follows:

- Information will be available on the biology, marketing and national and international markets for the main bamboo species found in the project's area of influence.
- Simple intermediate technologies will have been adapted for the efficient non-industrial processing of bamboo species found in the project's area of influence.
- Technical documents will be available for the dissemination of information about the rehabilitation and management of tropical forests with bamboo stands.
- Natural forests with bamboo stands that have been rehabilitated in the project area will be appropriately managed and sustainably harvested, both individually and in combination with other timber and non-timber forest resources.
- The rehabilitation of degraded forests will have been promoted in accordance with the relevant ITTO guidelines.
- Stakeholders in the bamboo production chain, who are highly motivated and participating in the achievement of project objectives, will have been duly trained in intermediate rehabilitation, management and/or utilization techniques, and will be sustainably harvesting tropical forests and producing articles that satisfy market demand.

[6] Averages statistics in the project area for the year 2004
Deforestation: 260,000 ha/year; Poverty: 62%; Increase in coca plantations: 12% (as compared to 2003).

- The income levels of local communities, particularly those who are living in poverty conditions and depend on forests resources for their livelihood, will have substantially increased as a result of the sustainable management and utilization of bamboo.

Because of the characteristics of the project and the similarities of the ecosystems in the montane tropical forests of the Selva Alta (High Tropical Forests) region of the country, which includes the departments of Huanuco, Pasco and Junin, the expected outputs and the communication strategy to be implemented by this project could have a positive impact throughout a wide-ranging and highly fragile socio-environmental area.

The information generated on bamboo biological, physical-mechanical and market aspects, will be very useful in improving the knowledge base on bamboo resources in Peru and other neighbouring countries.

The recognition of the environmental and economic value of bamboo will help to ensure the sustainability of moist tropical montane forests containing these resources.

2.3 PROJECT STRATEGY

In order to achieve the Project's planned development objective, i.e. to reduce the degradation of tropical forests, improve the socio-economic situation of the extremely poor local rural communities and improve the quality of the environment, the project strategy consists in strengthening the capacity of these local communities and committing them to actively participate in the rehabilitation of degraded forests, the sustainable management of forests with bamboo stands and the production of quality bamboo products.

This strategy will take into account the experiences of the Paca Project [PD 2/98 Rev.2 (F,I)], which has provided valuable information on bamboo species in this context and has identified the key factors for the harvesting of this resource and the corrective measures that must be taken so as not to limit its implementation. All of these issues have been taken into account in the formulation of this project proposal and/or will be applied during its implementation. The most important of these are:

- The technical team will be motivated, committed and involved in the achievement of project objectives, and under contract to a private organization, with work independence and stability.
- The integrated thematic (bio-physical, socio-economic and cultural) diagnosis will be available at project start up so as to facilitate the planning of specific activities.
- Demonstration plots will be located in duly cleared and easily accessible areas, with simple administrative mechanisms for their utilization and with specific agreements signed with those responsible for their management and harvesting.
- Knowledge will be acquired about the factors that could distract the attention of the main project beneficiaries, and mechanisms will be made available to counteract them.
- Appropriate and timely management of financial resources will be ensured, as well as permanent coordination with all parties involved and directly or indirectly related to the project.
- Simple and user-friendly equipment and tools will be available for the production of crafts using local bamboo.
- In order to ensure the sustainability of the project, PERUBAMBU, in coordination with the competent government organizations, both at the local and national levels, will keep project beneficiaries well informed on business opportunities available to meet the requirements of quality raw materials of other bamboo projects being implemented in the country, such as the Project for Popular Anti-Earthquake Constructions (quincha = bamboo + clay) and the construction of popular housing and social establishments (medical clinics and single-teacher public schools) being coordinated by the Government and the private sector (cooperating sources and PERUBAMBU), in addition to being actively involved in the "National Integrated Development Plan for the Bamboo Industry", sponsored and coordinated by the Vice-Ministry of Industry with the technical support of PERUBAMBU.

In order to strengthen the commitment, involvement and participation of the various stakeholders of the production chain (small producers, crafts-persons, traders and public servants), several activities will be implemented such as:

a) Initial meeting by region[7] on project objectives and scope.

[7] PERUBAMBU (12/2006) will organize an event with the participation of the main regional and local authorities elected in November of this year, to inform them about the objectives and scope of the project so as to ensure their support and participation.

b) Specific agreements will be signed with the holders of the lands where demonstration plots will be established as well as with other project beneficiaries and stakeholders interested in participating in the production chains, so as to ensure their commitment and participation.
c) Workshops to inform participants about the results of the integrated diagnosis and to coordinate activities to be implemented by each participant with a view to achieving the main project objective.
d) Promotion of interactive discussion among project beneficiaries from the different communities, so as to share experiences and knowledge, develop mechanisms for better mutual understanding and create a mutual support network among them.
e) Promote participation and excellence through group evaluations and internal competitions.
f) Permanent strengthening of participation mechanisms for all project stakeholders, especially local communities, local and national forest authorities, and participating non-government organizations.
g) Interactive theoretical/practical training courses on the establishment of demonstration plots, propagation methods and sustainable bamboo management, harvesting and utilization.
h) Regular meetings at the regional level with project stakeholders to evaluate the progress made, discuss potential problems, propose the necessary corrective measures and discuss other matters of interest to the participants that are directly linked to the implementation of the project. Annual meetings will also be held with the Project Steering Committee to evaluate project progress and, if necessary, to approve changes or re-orientation of activities.

The strategy to strengthen local capacities for the rehabilitation of degraded forests and forestlands will be to raise the awareness of the communities and authorities on the role and functions of the ecosystem in their economic activities and in the present and future environmental well-being of the communities. Some of the mechanisms to be used include the mass media and highly participatory training workshops.

Training and technology transfer will also include the empowerment of communities in the recovery and implementation of ancestral sustainable forest management techniques, taking into account the different cultures of each group of project beneficiaries, both in the design of the participatory planning and in the theoretical/practical training courses to be implemented. An essential element of this approach will be the ongoing participation and involvement of community leaders in all project activities, especially those related to planning and interventions within each individual community.

New strategic partnerships will be promoted and free-flowing communication channels will be maintained with local and regional private organizations, like those already established with URKU Estudios Amazonicos (Amazon Studies), Paz y Esperanza (Peace and Hope) – with headquarters in San Martin – and the Agricultural Service for Research and Economic Development (SAIPE) – with headquarters in Amazonas – among others, as well as with the leaders of native communities[8], local and regional organizations and academic organizations in the project's area of influence. This will facilitate the development and accumulation of knowledge, experiences, contacts and capacities for a better and more extensive parti cipation of the target population, thus ensuring the achievement and sustainability of project objectives.

In order to ensure greater and more effective participation of rural communities in the project's area of influence, a demonstration plot for the rehabilitation of tropical forests and the sustainable management of bamboo resources will be established in each of the departments as well as in the pilot centre "Mini Bamboo Crafts Centre – MINCABAMBU"[9], in a neutral and easily accessible location and with improved management capacity and access to national and international markets for its products[10].

The exact location and area of demonstration plots within each site will be determined after analysing the results of the participatory planning work to be carried out with the local communities, including the evaluation of the results of the integrated diagnostic study for the area and the identification of rehabilitation priorities, so as to subsequently determine the site that would allow the greatest number of people to benefit from the training provided and from the outputs of this activity.

The project will develop and strengthen cooperation mechanisms with relevant national and international public and private organizations, such as the Ministry of Production-Industry – Vice Ministry of Industry, the Export Promotion Commission (PROMEX), the Centre for the Technological Innovation of Timber CITE Madera, centres for technological development and training in forest resources management, as well as the corresponding regional and local governments and organizations. The project will also ensure the active

[8] The signing of agreements or MOUs with some communities will only be possible when project activities begin, which is understandable if we consider the different cultures and past experiences of some of these ethnic groups.
[9] MINCA: Community or group work in the native languages.
[10] The Sipan Museum and other historical sites are found in the city of Chiclayo.

participation of organized rural communities through Forest Management Committees as envisaged in the Forestry and Wildlife Law of Peru (No. 27308) and the technical support of the International Network for Bamboo and Rattan – INBAR, the Chinese Forestry Academy and the Colombian Bamboo Association, among others.

The transfer of technology required to support the sustainable socioeconomic development of local communities should be aimed at meeting the requirements of the target population, which will be selected during the initial workshops for the dissemination of project objectives and expected outputs, with the participation of representatives of local governments and native communities, especially those that have indicated an interest in the implementation of the project, with whom the project will undertake dissemination activities.

In order to strengthen the extension capacity of project stakeholders, meetings will be held regularly at the community and local levels, in addition to specific workshops, which will be mainly aimed at discussing project progress, answering any questions that may arise from farmers and local communities, and promoting the establishment of production chains with the participation of local producers and craftsmen, so as to ensure economic benefits for the largest possible number of people. The selection of participants for these events will be based on their own interests and vision about bamboo resources, without any gender or cultural distinctions, but preference will be given to those with the least employment opportunities in other activities.

The *ex ante* and *ex post* socio-economic evaluations will help to more precisely identify project beneficiaries and evaluate the socio-economic impact of the completed project.

The strategy to be followed is consistent with the principles established in the ITTO Guidelines (ITTO, 2002) for the restoration, management and rehabilitation of degraded and secondary forests.

2.4 TARGET BENEFICIARIES

The objective of this project proposal is to provide direct and indirect benefits to the various stakeholders in the departments covered by the project area. In this regard, the direct beneficiaries in the rural communities will be small farmers, small forest concession holders, independent bamboo producers and, in general, the rural communities living in the project's direct area of influence.

Producers of handicrafts, including farmers or persons from rural communities or human settlements in urban centres, will also benefit from the project as they will be able participate as members of production chains for the production and processing of these forest resources. However, the main project beneficiaries will be the women and young people currently living in poverty conditions, who will actively participate in the training activities envisaged by the project, as they will be given preferential treatment to participate in the bamboo production chains that will receive technical support from the project.

Given that the project will train at least 250 people in the project area, the number of direct and indirect project beneficiaries in the immediate future could be more than 5,000 people taking into account direct family members (an average of 2,000 people), community members who use bamboo instead of traditional timber species for their housing, household utensils and agriculture (2,000), the manufacture of bamboo crafts for commercial purposes (150), timber loggers who will receive information on tropical forest management techniques (250), bamboo distributors (50), builders (50), and other local farmers and craftsmen (250).

Other important project beneficiaries will be INRENA's technical staff and the professional staff of partner NGOs and institutions involved in forest and/or natural resources research, as they will be able to participate directly in research activities and contribute with their local knowledge and experience to the attainment of the project's specific objectives, and will benefit from having direct access to training on techniques for the rehabilitation and sustainable management of forests with bamboo stands.

The local, regional and central governments will all benefit from the project, because it will contribute to the achievement of the objectives of the National Plan for sustainable forest utilisation, conservation of natural resources and forest rehabilitation and management. Indirect project beneficiaries will also include all other persons who, based on the information disseminated through the internet (web page), the media (radio and television) and technical manuals prepared by the project, will be able to apply intermediate techniques for the rehabilitation and management of forests with bamboo stands, thus contributing to the sustainability of tropical forests in other regions of the country.

In brief, the project beneficiaries will be:

- Rural communities (natives and mestizos),
- Traders, craftsmen and other production chain stakeholders,
- Community leaders,
- Local private, non-profit organizations,
- Local and regional academic institutions,
- Local and regional forest authorities,
- Local and regional governments,
- INRENA,
- PERUBAMBU.

Some of the benefits to be derived from the project include:

- Rehabilitation of degraded forests,
- Forest management,
- Valuation of the potential of the country's tropical forests,
- Valuation of the utilization of non-timber forest products as a sustainability mechanism,
- Valuation of value-added forest resources,
- Curbing of the expansion of the agricultural frontier,
- Reduction in the growing of illegal crops,
- Creation of new sustainable development alternatives,
- Generation of employment opportunities for both men and women,
- Alleviation of poverty,
- Reduction of rural-urban migration,
- Rural socioeconomic development.

TABLE No. 2 - Summary of project stakeholders

STAKEHOLDERS	CHARACTERISTICS	PROBLEMS	SKILLS/CAPACITIES	INVOLVEMENT IN PROJECT	BENEFITS
Native communities and population centres	Main activity based on the non-sustainable harvesting of forest resources.	Very poor, marginalized from the benefits of modernization and from economic development opportunities.	Knowledge of the environment.	Main project beneficiaries.	Improved knowledge about the environment and significant improvement of their socio-economic and environmental levels.
Semi-urban and urban dwellers	Poor craftsmen with low levels of training and small informal merchants	Lack the capacity to identify mechanisms that will guarantee an increase in and/or the sustainability of their income.	Willingness and interest to improve themselves through training in matters pertaining to their economic activities.	Project beneficiaries in activities related to the processing of forest resources.	Personal and environmental development, substantial improvement of their socio-economic level.
Retailers	Generally not from the region, gatherers of forest resources.	Limited vision of the future, lack of knowledge about the importance of ensuring the sustainability of their forest resource sources and no environmental involvement whatsoever.	Open to new opportunities.	Indirect project beneficiaries.	Strengthened capacity in environmental matters. Improved economic conditions.
Local leaders	Leaders of native communities, leaders of population centres and leaders of local organizations.	Limited capacity to plan and to identify sustainable development alternatives in accordance with their culture and customs.	They are the authority in their population centre or community, with the capacity to exert a great deal of influence.	Main stakeholders in matters related to coordination and planning at the local level.	Beneficiaries of project impact in their communities.
Local and regional NGOs and regional academic institutions	Actively involved in activities aimed at strengthening local capacities and in agricultural and timber based silvicultural projects.	Lack of experience in the implementation of environmentally sustainable, socio-economic development projects.	They have experience working in the region and have gained the trust of local communities.	In relation to the experience, scope and implementation of development activities.	Beneficiaries of project impact and specialised extension activities.
Forestry and Fauna Technical Administrators (Local and Regional)	Actively involved with the local reality and with their institution.	Insufficient financial and human resources and limited opportunities to strengthen the capacity of their personnel.	Open to opportunities of rural extension and training activities.	Directly involved in the implementation of the project together with the executing agency.	Accomplishment of their duties in this field and strengthening of their technical capacity.
Regional and local governments	Politicians who will begin a new mandate from January 2007 to 2011.	Newly implemented decentralization process, limited capacity for the integrated planning of regional and local development.	Increasingly involved in environmental matters.	Potentially highly motivated to improve local and regional environmental and socio-economic conditions.	Accomplishment of their duties and beneficiaries of project impact on their communities.
Other State agencies	Limited knowledge about the potential of forest resources for the development of the national industry and tourism.	Poor coordination with forest authorities and limited technical and financial capacity at the local level.	Open to new alternative opportunities of economic development.	Partially involved in non-industrial processing activities.	Improved development alternatives in their areas of competence.
INRENA	National organization responsible for the implementation of the national forest policy.	Limited financial capacity and, therefore, technical capacity to implement forest development activities.	National authority with very experienced professionals in environmental matters.	Directly involved in project coordination and monitoring activities.	Performance of their duties and training of their officers.
PERUBAMBU	Directly responsible for the project, with experience in conservation, management and renewable natural resource utilization projects, particularly bamboo-related projects.	Private, non-profit organization, with the financial limitations that are to be expected during the initial stage of institutional development.	Capacity to generate and multiply the effects of inter-sectoral partnerships and to carry out integrated planning exercises.	Directly involved and responsible for the full implementation of the project.	Compliance with institutional objectives and strengthening of their capacity.

2.5 TECHNICAL AND SCIENTIFIC ASPECTS

Latin America[11] is the richest region in the world in terms of diversity and number of woody bamboo species, with 20 genera and 429 species, and Peru is one of the countries with the highest diversity[12] and potential for the development of this resource (Annex 2: Map of Distribution of Main Native and Exotic Bamboo Species).

The physical and mechanical properties of the mature culms of some woody bamboo species from South American tropical forests are similar or superior to some timber species[13], thus constituting an important source of materials for the construction and laminates industries, and for the production of craft furniture, among other uses.

The predominant species in the Amazon region are *Guadua affin angustifolia, G. sarcocarpa* and *G. weberbaueri.* These species grow in association with tree species such as cedar *(Cedrela odorata)*, cetico *(Cecropia sp.)*, palms *(Iriartea spp.)*, ojes *(Picus sp.)*, siringas *(Hevea sp.)*,lagarto *(Weistenia macrophylla)*, pashaco *(Macrolobiun acaciafolium), Erytrina spp.,* bolaina *(Guasuma trinita)* and lupuna *(Bombacaceae),* among others, while *G. superba* is characterised by its capacity to grow in areas of palm swamps (aguajales) in association with palma pona, shiringa, Maranthaceae and Olyras.

The native and introduced species with the greatest potential in the project area are: *Guadua sarcocarpa spp purpurea, Guadua weberbaueri, Chusquea sp. Neurolepsis weberbaueri, Rhipidocladium racemiflorum, Bambusa vulgaris* and *Bambusa tulda.*

As a partial output[14] of Project PD 2/98 Rev.2 (F;I), the first Management Plan for bamboo species in the region has been formulated for an area of more than 2000 ha. The industry has started to produce bamboo laminates for the production of furniture and handicrafts, using wood strips prepared with the project's machinery; however, it is still necessary to complete the product preservation, drying and finishing processes.

Even though the facilities and equipment available are adequate for training and dissemination of bamboo processing technologies, there are still many difficulties faced in the provision of ongoing and safe communications and transport services, and this is currently the main limitation for the efficient use of this resource.

In this context, from Antioquia in Colombia to Huaquilla in Ecuador - areas that have similar characteristics to many localities in Peru - substantial progress has been made in the management, harvesting and sustainable utilization of "guadua" (*G. angustifolial,* Kunt), particularly after the earthquake that took place in the region of Quindio (Colombia) and the "El Nino" Phenomenon, which affected the coastal region of Ecuador. These two natural disasters, which occur frequently in many areas of Peru, have demonstrated the strength, flexibility, beauty and low-cost properties of bamboo species when compared to other materials.

The Pilot Project on Bamboo implemented by INBAR in Ecuador from 2003 to April 2006 with the financial support of the European Union, whose objective was to contribute to the alleviation of poverty and to a decrease in deforestation through different uses of bamboo, has carried out pioneer activities in the areas of the propagation, management of plantations and natural clusters, and the associated harvesting, processing and marketing of *Guadua angustifolia.*

In ITTO-financed Project PD 56/99 Rev.1 (I) "Promotion of the Utilization of Bamboo from Sustainable Sources in Thailand", successful research has been carried out on management and processing techniques for 5 bamboo species for the production of furniture, handicrafts and charcoal. The project has also developed the capacity of the local communities for the efficient and diversified utilization of bamboo,

[11] American Bamboos, 1999, Judziewicz E.J., Clark L.G., Londono X. & Stern M.J.
[12] X. Londono, 1999
[13] Jules. J. A. Janssen (@INBAR, 2000): Comparative studies undertaken at the Eindhoven Technical University on different materials (steel, concrete, timber and bamboo) for structural uses, where bamboo came in second in stress resistance and first in twisting resistance.
[14] During the project implementation period, intense logging of mahogany in this area led to the implementation of strict control measures with the consequent reaction of the parties involved. A climate of violence and constant upheaval predominated in the region, seriously affecting regular activities in the region and, as a result, the attainment of project objectives. Currently, mahogany resources are scarce and the authorities are well aware of the value of the resource and its potential for the generation of employment and income, thus making it imperative to support its reactivation.

providing income-generating alternatives to the rural communities grouped in trained and strengthened organizations.

Over the past few decades (1975 to 2003) China has been the one Asian country that has had the most significant increase in the production of bamboo culms, with a growth in the production of industrial products that went from US$ 600 million in 1990 to US$ 3.5 billion in 2003. In some regions of the country there has been a yearly increase in household incomes of US$ 900.00 per family over and above their non-bamboo related earnings, a greater number of employment opportunities have been created, particularly for women, through the use of new technology, and new products have been developed and improved on the basis of the research and extension programs implemented in different areas related to the resource.

In the district of Anji, in the province of Zhejiang, 100% of the plant is used for the production of a variety of products, based on a development model that ensures the participation of the bamboo producing farmers, the communities from the village where the primary processing is carried out, the "entrepreneurs" who use different parts of the primary processed material to produce high value added articles, and the researchers who contact and liaise with the entrepreneurs and rural communities for the development of machinery and the conduction of research that responds to their needs in the field.

INBAR[15] is an international organization based in China. It has wide-ranging information about different bamboo development models techniques for its industrial and non-industrial utilization, that is transferred to interested parties through specialised international courses run every year in conjunction with the Forestry Academy of China and other local organizations, as well as through different articles it provides for individuals and companies affiliated to the institution and to its network of expert consultants.

This knowledge could be used to formulate a customized development model that, by adapting existing know-how, could generate appropriate technologies for the sustainable management and processing of bamboo resources found in the tropical forests of Peru and thus ensure the sustainable development of the rural populations.

2.6 ENVIRONMENTAL ASPECTS

Natural bamboo stands in Peru cover approximately 39,978 km^2, which accounts for 3.1% of the national territory, and it is estimated that there are approximately 3.6 million hectares with high bamboo concentrations. The plant composition and morphological structure of these natural associations and the local soil and physiographic conditions of the sites they are found in are characteristic of a type of forest that, according to the Forestry Map of Peru Guide (INRENA, 1996), correspond to bamboo forest known as "pacales". These formations are found in a diversity of ecosystems including flat meanders, alluvial terraces, hills and mountains, at altitudes that range from sea level to almost 2,000 m.a.s.l., in areas of high rainfall levels and alluvial soils.

The project area covers approximately 17,400,000 ha, of which 57.3% (9,970,200 ha) are moist tropical forests and 9% dry tropical forests (1,566,000 ha), both of which have been subjected to unsustainable timber logging practices, deforestation for agricultural purposes and, in some areas, deforestation for the production of illegal crops.

According to estimates from the National Institute for Natural Resources – INRENA, deforestation activities in Peru have been mainly implemented to extend the agricultural frontier on lands that are not suitable for agricultural purposes, with the most affected region being Selva Central (Central Forest Region), where the rate of deforestation is 182,133 ha/year, or 0.66% and an annual increase of 9.9%. If this deforestation rate were to continue, by the year 2020 the region would be classified as being under a desertification process, and would be subjected to the disastrous consequences that this entails, including the accelerated loss of biodiversity that is endemic to this region and the loss of water sources that feed the lowland areas.

This region has the road infrastructure and other facilities required to ensure easy access and smooth communications for the majority of rural communities, native communities, small-scale farmers and small-scale forest concessionaires, among others, who are interested in participating in the production chains for the sustainable harvesting and processing of bamboo. The Pan-American Highway links the cities of Piura and Chiclayo with the capital. These two cities, situated on the Pacific Coast, are in turn linked to the cities of Huancabamba, Jaen, Bagua, Chachapoyas, Moyabamba, Tarapoto, Santa Maria de Nieva and Yurimaguas, among others, which constitute the northern road network that interconnects the Pacific and Atlantic Coasts and cross the Amazon river and its tributaries.

[15] PERUBAMBU is affiliated to INBAR

However, the environmental impact that has resulted from the development of this important road network, the increase in timber logging activities, the shifting agricultural practices and the areas that have been planted with illegal crops, all require immediate remedial action so as to curb their expansion and mitigate their impact, in order to contribute to the economic development of the poorest communities in this region of the country.

Furthermore, it should be pointed out that, over the last few years, there has been an alarming increase in deforestation activities for the growing of coca and poppy crops. These deforestation activities have resulted in a shortage of timber and other forest products, given the ever-increasing distance of production forests to the processing plants and major consumption centres, as well as supply problems to the installed forest industry, a lack of employment opportunities and greater levels of poverty.

In addition, the fertile inter-Andean valleys that are supplied with water from the rivers that flow from the western slopes of the Andes and are situated between 3° and 7° Latitude South and between 77° and 80° Longitude West, are being extensively used for the cultivation of rice, with the resulting salinisation and deterioration of existing soils. However, the presence of healthy bamboo stands on these lands demonstrates the suitability of these soils and the potential that exists for the establishment of bamboo plantations, either as a single crop or in combination with others of similar ecological value, thus contributing to the rehabilitation of these lands and to an increase in the area covered by permanent tropical forests.

In the village of Florida, situated in the catchment area of the Zaña River, there are still important clusters of bamboo resources, whose area and potential harvestable volumes have not yet been determined, but that because of their easy access, geographic location and agricultural activities they are being subject to, they are being rapidly exploited without the application of management techniques to ensure their conservation and sustainable utilisation.

In the departments of Cajamarca (Jaen, San Ignacio, Saña), Amazonas (Bagua and Sta. Maria Nieva) and San Martin (Moyabamba and Chachapoyas) among others, there are large natural stands of *Guadua spp.*, including *G. affin angustifolia* (marona) and *G. angustifolia* (guadua or Guayaquil cane) which are used in a small scale in rural constructions and marketed in small volumes to satisfy the demand in the coastal region. In the city of Piura to the north of Chiclayo, which has areas that are suitable for bamboo development, there is an intensive trade of the species known as "Guayaquil cane", which mainly comes from Ecuador and, in lesser volumes, from plantations that have been established on rural plots in the moist tropical forests of Huancabamba.

The development of appropriate technologies for bamboo management and processing of value-added bamboo products will allow Peru to ensure the conservation of moist tropical forests and, as a result, the conservation of the biological diversity found in these ecosystems.

In areas with reforestation potential, bamboo resources will produce environmental and ecological benefits such as the rehabilitation of eroded soils, increased carbon sequestration, prevention of landslides in highly dissected hillsides, and an improvement in soil quality. The studies undertaken to date have shown that the contribution of bamboo to the conservation of soil and water resources is much higher than that of other forest species. Its rate of growth (increasing in biomass by up to 30% annually) makes bamboo a very valuable species for carbon sequestration, especially large woody bamboo species which can grow by up to 10cm a day.

2.7 ECONOMIC ASPECTS

Economic development is one of the most important project objectives, directly linked to the increased potential of the rehabilitated and reforested areas for the sustainable harvesting of bamboo and the value added processing of handcrafted bamboo products, which will improve the income levels of the local communities.

The economically active population by department is as follows: Amazonas: 56%, of which 47% are women; Cajamarca: 56%, of which 49% are women; Lambayeque: 62%, of which 50% are women; San Martin: 60%, of which 45% are women; and Piura: 59%, of which 50% are women.

According to the Peru Forestry Yearbook (Anuario Peru Forestal[16]), in 2004 timber exports accounted for a total of US$ 160,841,134.04 and non-timber products for a total of US$ 54,206,264.28, or in other words, 33.7% of timber exports, with less than 1% of this figure corresponding to bamboo and other weaving materials of plant origin. In 2000, however, timber exports accounted for a total of US$ 100,235,473.08 and non-timber products for a total of US$ 14,207,241.03, or 14.17% of timber exports, with bamboo and other weaving materials amounting to only 0.03% of this total.

The increase in bamboo exports is inversely proportional to the production of bamboo in these two periods, because in 2004 only 33,796 units were produced in the department of San Martin, a much lower figure than in the year 2000, when 130,082 units were produced. In other words, in 2004 there was a decrease in bamboo production of approximately 75% at the national level compared to the year 2000.

According to data from the Exports and Investment Promotion Corporation (Corporación de Promoción de Exportaciones e Inversiones – CORPEI) of Ecuador, Peru is the main destination (90%) for *Guadua angustifolia* (Guayaquil cane) culms produced in the neighbouring country and come into Peru through Aguas Verdes in volumes that amount to US$ 1 to 2 million. Peru also imports smaller volumes of *Chusquea coleu* culms from Chile. In other words, imported bamboo already has a significant national market in Peru, particularly in the holiday housing construction and high quality furniture industries, while nationally produced bamboo is used in rural construction and in the manufacture of products of low value added and low economic value.

It has been estimated that there is a total of nearly 4 million hectares (with an average density of 30%) of areas of tropical forests with bamboo stands in the Selva Central and south-eastern tropical forest regions of the country. This represents approximately 50,000 m^3 of harvestable raw materials, without even including the bamboo volumes present in the north-western region of the country, which are found in smaller areas but are nevertheless important.

Taking into account the potential of bamboo resources in Peru, to date only used exclusively for local household use, it is clear that their sustainable harvesting and processing constitutes an excellent opportunity to improve the economic situation of rural communities, firstly to satisfy the requirements of the national market and secondly as a new export alternative, especially when considering existing markets and the commitments for the international trade of this species.

In general, forests with sustainably managed medium (40%) to high (70%) density bamboo stands can generate an annual production of 1,400 to 3,500 culms/ha respectively[17]. In the natural forests of the project area containing bamboo stands with an average density of approximately 70%, it is possible to achieve an average harvesting rate of 50 - 65% of the total number of culms present, or an annual total of 1,750 - 2,275 culms/ha, which can be sold at US$ 0.75 to 1.00[18]/8-m culm. In other words, the communities could get an additional income of US$ 1,312 – US$ 2,012/ha/year. The value of these culms increases with the application of appropriate drying and preservation techniques, using environmentally friendly products[19]. The other parts of the stems can also be sold for different purposes for US$ 0.25 to 0.30/stem.

Thus, the income that the local communities could receive as a result of the direct utilization of bamboo resources could be more than US$ 2,000/ha/year, an amount that could increase with the restoration of the forest through the rehabilitation of degraded areas, as well as with the value added in the production of craft products, surpassing the US$ 3,000/ha/year mark, which is close to the investment of this project per hectare.

Considering the volumes of the so called "Guayaquil cane" and the export of bamboo products exported from China, mainly to Japan, USA and Europe, Peru has an enormous potential to satisfy the market demand in the countries of the Northern Hemisphere, because the physical and mechanical properties, (hardness, flexibility and strength) of Peruvian bamboo species is probably very similar to those of other Latin American bamboo species, thus making it possible to successfully compete in the international market.

[16] INRENA, 2000 and 2004, Forest Administration, Forest Information Centre.
[17] INBAR 2004: Natural Guadua forests in Colombia have average densities ranging from 3,500 to 5,000 culms per hectare. The vertical distribution structure of individuals makes the stands sustainable in both space and time.
[18] Currently, some communities sell complete culms of 15 to 18 m at US$ 0.45-0.50 and generally harvest immature culms, thus weakening the plant.
[19] Borates

Justification for the resources requested:

Because of the above reasons, the resources requested from ITTO are very important to finance the following budget items:

- The remunerations of a reduced group of professionals and selected assistants responsible for the direct implementation of the project and of national and international consultants that will carry out the biological and socioeconomic diagnostic studies, as well as for the strengthening of local capacities in bamboo management techniques and non-industrial utilization of bamboo, as required to ensure the success of this project.
- The construction of the basic infrastructure required for training in intermediate techniques for the non-industrial utilization of bamboo[20].
- The purchase of equipment, tools and basic inputs required for bamboo rehabilitation, management and non-industrial utilization.
- The purchase of a vehicle to transport project personnel and materials[21] and facilitate their activities throughout the project area.
- The cost of dissemination and training events, transport and DSA in general, for project personnel, consultants, strategic partners and project beneficiaries.

PERUBAMBU, the agency responsible for the implementation of the project through a Project Executing Unit (PEU), is a non-profit organization with the financial limitations that this entails. However, the organization will cover all administrative costs of the project (acquisitions, accounting). The GIS expert will provide support for the preparation of a Thematic Diagnosis report, technical reports and other technical documents. Using his/her professional and project management experiences, the professional assistant to the Executive Director, will participate during the initial stage, providing support to the external consultants, preparatory activities, and diagnosis and evaluation activities, thus contributing to the reduction of the contractual duration of consultants and professionals to be financed by ITTO. Furthermore, he/she will provide administrative support to the PEU. PERUBAMBU will also contribute with capital goods and consumable items.

Furthermore, even though the officers employed by the Peruvian Government receive comparatively low remuneration levels – despite the fact that they carry out highly responsible duties of excellent quality – the Government will contribute to the project by financing the participation of the officers responsible for forest management activities in the project area and at the headquarters of forest project specialists, and it will also contribute with capital goods (lands), which will all contribute to the achievement of project objectives.

2.8 SOCIAL ASPECTS

The project's direct area of action and influence has been selected after taking into consideration not only the presence of natural and planted bamboo stands in different areas of the departments covered by it, but also the cultural, social and economic characteristics of the region (Table No.1) such as the relatively high percentage of population in relation to the national total (20%, or 5,580,797 inhabitants), the high percentage of the population classified as poor (3,476,978 inhabitants = 62%; 32.5% poor + 29.5% extremely poor), and the gender and age composition of the population with nearly 50% of the total population being females and 37% being under 18 years of age, most of whom live in rural areas.

There are approximately 146 legally recognised native communities of the Aguaruna Huambisa ethnic group (Jibaros) living in the project area. Most of these communities are located in the department of Amazonas and a smaller number in the departments of San Martin and Cajamarca.

The most important economic activities of these communities are agriculture and the utilisation of renewable natural resources, especially timber and wildlife species. The shifting agricultural practices that these communities use are the cause of a high level of deforestation, particularly in hill and mountain tropical forests in the watershed areas of the Marañon, Huallaga and Santiago rivers.

[20] Training in intermediate techniques for the non-industrial production of round-cane furniture, wickerwork and small accessories.

[21] Passenger transport, which is only available between major population centers, is informal and irregular. Most vehicles (cars and microbuses) belong to operators who provide the service without established timetables over relatively short routes. The hiring of these vehicles is very costly and only suitable in exceptional cases. To go from Chiclayo to Moyobamba (375 km), one needs to take 3 to 4 vehicles and the trip takes 16 to 18 hours due to the waiting times at each stop. Furthermore, a vehicle is necessary to travel through forest tracks (forest access: 10 to 20 km from the main road).

The departments with the highest poverty levels are Cajamarca (73.4%), Amazonas (70.5%) and San Martin (62.9%), with an average monthly income of US$ 113 and US$ 156 for rural and urban dwellers respectively. The majority of the population does not have access to drainage and sewerage systems and almost half the population does not have access to public drinking water services (>40%). The average infant mortality rate stands at 4% (under 1 year of age).

The city of Chiclayo, the capital of the department of Lambayeque, where the Pilot Centre for the handcrafted processing of bamboo products will be located, has been selected on the basis of its location, the road network that connects it to the main areas where the demonstration plots will be established, the infrastructure and services available to ensure the implementation and continuity of training programs, and the support of government authorities and private organisations operating in this area.

There are approximately 146 legally recognised native communities of the Aguaruna Huambisa ethnic group (Jibaros) living in the project area. Most of these communities are located in the department of Amazonas and a smaller number in the departments of San Martin and Cajamarca.

Table 1 – Socioeconomic profile of the project's area of influence[22]

No.	Description	North Western Region
1	Area of influence (Departments)	Lambayeque, Amazonas, Cajamarca, San Martin, Piura
	Total area	173,943.77 km^2
2	Total population (5 Departments)	5,580,797
	Poor and extremely poor population (average in 5 Departments)	3,476,978 (35.2% + 26.8% = 62.0%)
	Poor population by Department • Amazonas • Cajamarca • Lambayeque • Piura • San Martin	 320,750 (70.5%) 1,123 599 (73.4%) 506,705 (44.4%) 1,055,418 (62.6%) 466,874 (62.9%)
	Total population /Women	5,580,797 / 2,738,714 (49%)
	Total population /Under 18 years of age	5,580,797 / 2,034,288 (36%)
	Most important sources of income	Mining; Agriculture; Forestry; Fishing
	Average yearly income/urban areas	US$ 1,878.00
	Average yearly income/rural areas	US$ 1,353.00
3	Number of primary schools	8,635
	Number of secondary schools	1,776
	Public universities	7
	Airports/ports	3 airports category II 1 airport category III 2 airports category IV 14 Maritime ports 5 river ports category IV
	Paved roads	Main road: Pan-American Highway (North)
	Distance between major cities in the project area	Piura – Chiclayo = 213 Km Piura – Tunal = 200 km Chiclayo – Bagua = 334 km Chiclayo – Florida = 97 km Bagua- Moyabamba = 278 km Moyabamba – Tarapoto = 118 km Bagua – Sta. María de Nieva = 408 km Chiclayo – Lima = 757 km Chiclayo – Iñapari = 2653 km Moyobamba – Iñapari = 3,609 km

[22] Source: National Institute of Statistics – (Instituto Nacional de Estadistica – INEI, 2004)

2.9 RISKS

The main risks associated with the implementation of this project are:

1. That the main project stakeholders (local communities, participants of the production chain and authorities of the different levels of government) limit their participation or do not get involved in the implementation of project activities.
2. That the national and local authorities limit the participation of their technical experts in the project or do not participate in project activities.
3. That factors beyond the control of the project or project personnel (e.g. drug trafficking, terrorism and illegal logging) hamper the normal development of scheduled activities aimed at achieving expected project outputs.
4. That ethnic/cultural differences obstruct adequate and smooth communication processes and, as a result, prevent the active participation of native communities and/or other production chain stakeholders in project activities.
5. That the expectations of the local communities are greater than the scope of project outputs.
6. That the market does not respond favourably to the bamboo products produced.

In order to mitigate the risks linked to a lack of participation and involvement in the project, a strategy will be implemented to ensure ongoing communication and participation in meetings at all government levels, as well as all production chain stakeholders, especially native and mestizo forest communities, so as to jointly evaluate project progress and identify alternatives to reduce risks and ensure the success of the project. The project will thus ensure that all participants are clearly aware of the true scope of project activities and, therefore, of the benefits that they can derive through their participation.

The participation of government bodies, which will facilitate inter-sectoral relations, will depend to a great extent on the stability of the guidelines of the current government policy (2006-2011), which at present guarantees the participation and support of government authorities in the implementation of the project, and the government has sent a very important message in this regard to local authorities, forest industrialists and local communities in general. Furthermore, it will also be necessary to maintain ongoing communications with all relevant stakeholders, so as to provide them with the necessary information and/or clear up any doubts that may emerge in relation to project outputs.

The implementation of the project under a government that has only recently begun its mandate (2006-2011) but that has already established that bamboo is a national priority, that is promoting stability and strengthening the capacity of technical experts directly involved with project activities, that has initiated an integrated campaign to fight against drug-trafficking and terrorism and is promoting coordinated actions with the formal private sector, local communities and authorities against illegal logging and poverty alleviation, minimizes to a great extent the risks related to these aspects. However, coordination and ongoing dialogue based on specific project outputs and the active participation of local communities throughout the whole process will be the main guarantees to ensure the success of the project, because all stakeholders concerned, including target beneficiaries, their relevant government authorities and project executors, will be well aware of the risks involved and will all be prepared to face up to these risks.

The participation of international experts from neighbouring countries and from INBAR in activities related to biological aspects and bamboo management and non-industrial crafts production will help to strengthen the capacity of project technical staff and enhance their participation and performance. PERUBAMBU and its strategic partners with experience in the development of projects with native communities in this area of the country, and with the assistance of the social expert, will provide support for the development and implementation of a specific communications strategy for each group.

Training activities for the local communities will focus on intermediate techniques, ensuring that they are easily understood and can be used by the greatest number of people possible, regardless of their gender or level of basic education. To this end, bamboo processing technologies will be aimed at the production of simple but good quality products, using simple, small and multiple-use tools and equipment, which will cost significantly less than those acquired by the Paca Project but will still meet the requirements to achieve project objectives with minimum investment risks.

With reference to economic and commercial aspects, the project will seek to minimize marketing risks by coordinating activities and receiving support from PRODUCE and PROMPEX, so as to ensure that the products meet market demand and/or encourage market growth.

3. OUTPUTS

3.1 Specific objective

Ensure the rehabilitation, management and sustainable utilisation of bamboo resources in the north-western region of Peru.

Output 1.1

Local population (250 people) trained in intermediate techniques for rehabilitation, management and sustainable utilisation of forests with bamboo stands.

Output 1.2

Tropical forests (200 ha) rehabilitated and sustainably managed.

Output 1.3

Rural communities (2000 people) actively involved in and economically benefiting from (4) bamboo production chains.

4. ACTIVITIES

Activity 1.1.1
Thematic diagnostic assessment.

This activity will include a literature review and a general desk evaluation of physical, biological (forest types, vegetation), socioeconomic and ethnic-cultural characteristics of the project area, a rapid field assessment to be supplemented with knowledge from local communities and GIS analysis, development of thematic maps for specific sites within the project area, and identification of forest areas to be rehabilitated with precise location of demonstration plots.

Data collection, identification and evaluation of taxonomic, physiological and morphological characteristics of bamboo species in the project area will be carried out with the support of Latin American experts and specialists from international organisations such as INBAR. This study will facilitate the identification of species to be used for the rehabilitation and management of permanent production forests with suitable morphological characteristics and physical-mechanical properties for sustainable utilisation.

The study on physical-mechanical properties of 1 bamboo species with development potential in each of the project areas will be carried out by a specialised technical institution in accordance with international standards (ISO/DIS 22157 "Assessment of physical-mechanical properties of bamboo").

Community and local meetings will be held with the community of each locality to discuss the characteristics of demonstration plots and degraded permanent production forest lots for rehabilitation, to define boundaries and final area, and to identify, on the basis of the available information, the activities required in each specific case for implementation and achievement of outputs.

Experimental technological tests developed in other countries for the processing of bamboo to be used in the construction industry and in the manufacturing of household and office accessories, including in particular laminated and/or round bamboo for furniture manufacturing, bamboo mats for walls and/or flooring, and handicraft products, will be assessed in detail by the project technical team with the support of the international expert in association with research institutions such as CITE Maderas of the Vice-Ministry of Industry, Ministry of Production.

The project will coordinate a study on the current status, potential demand for bamboo products in the national and international markets, and possible marketing channels, with the participation of direct project beneficiaries. This study will evaluate potential (current and future) markets for the marketing of bamboo products in the United States and in the European Union. This activity will be implemented in association with the industrial, trade and export sectors through relevant public and private bodies.

Activity 1.1.2
Mini Bamboo Crafts Centre - MINCABAMBU equipped and operational.

Facilities will be built in a government-owned site of approximately 400 m^2 situated in the city of Chiclayo, Department of Lambayeque, within the framework of inter-institutional cooperation between PERUBAMBU and INRENA, the Ministry of Production – PRODUCE and the Regional Government of Lambayeque – GOREL.

Given the location and objectives of the centre, bamboo will be the main material used, as well as other materials preferably from the region. The Centre's infrastructure will be simple and will include, restrooms, inputs warehouse, and workshop area. The construction of the Centre will be under the responsibility of a subcontractor with wide international experience in this type of buildings, who will follow the design developed by PERUBAMBU.

The Centre will be equipped with basic equipment for bamboo utilisation and processing, following the recommendations of the technical team and experts in non-industrial bamboo processing hired by the project, as well as recommendations from INBAR experts.

The basic equipment for the production of bamboo products will be preferably acquired in the country and will only be imported from overseas when absolutely necessary, in accordance with identified technological specifications and the report of international experts to be hired by the project.

MINCABAMBU will focus on the production of round-bamboo furniture, bamboo mats, and utility and decorative bamboo handicrafts for home and/or office use.

During the second half of the first year of the project, after completing the construction and equipping of the Pilot Centre, the project executing agency will convene a workshop with the participation of selected local community representatives and rural development experts from the Ministries of Agriculture (MINAG), Production (PRODUCE) and Foreign Trade (PROMPEX), INRENA and Regional Governments in the project area, so as to explain to the local communities the various technical and legal aspects of its establishment, operational mechanisms, and benefits and obligations of members, among others.

Activity 1.1.3
Strengthening of project technical team's capacities and training of project's target communities:

Training of project team members (4 people) in tropical forest rehabilitation techniques, nursery planning and implementation, and management of forests and plantations with bamboo stands. The training will be conducted by experts in the field and will include theoretical and practical sessions. INRENA technical staff (10 people) in charge of promotion and training activities in the area of tropical forest management with forest concessions and rural communities in general, will also participate in the training workshops, thus ensuring project sustainability.

Training on plantation management will include bamboo seedling propagation and management and harvesting systems. The training component will be strengthened with the participation of project management in workshops or internships offered by Andean countries with more experience in the management and utilisation of the bamboo species "Guadua" (*Guadua angustifolia*) (Colombia and Ecuador).

Project technicians will visit the Integrated Bamboo Centre, managed by small producers in Carlos Julio Arosemera, Province of Guayas, Ecuador. This centre was established within the framework of a Bamboo Pilot Project financed by the European Commission and implemented by INBAR, with the aim of monitoring the progress made in that country regarding the development of the bamboo production chain, including nurseries, plantations, management, primary processing and manufacturing of furniture and crafts; as well as collecting information on the experience of local communities in each of the phases of the bamboo production and utilisation process.

Selected poor local communities (250 people) will actively participate in workshops and training sessions on intermediate techniques for rehabilitation and management of degraded forests with bamboo stands and handcrafted manufacturing of quality bamboo products.

The training workshops on silvicultural techniques will comprise theoretical lectures as well as practical field work. Furthermore, this activity will involve the identification of beneficiaries to work on demonstration plots. These beneficiaries, who will be selected among concession holders or land owners (native communities and/or small farmers with production forests), will be trained in rehabilitation and management techniques in the actual demonstration plots and forests to be rehabilitated.

According to the requirements of local and regional governments and local associations, the project management, at no additional cost to the project in terms of participants' travel and DSA costs, will organise courses/workshops which have not been scheduled within the framework of this project. These workshops will seek to promote the rehabilitation of degraded forests and sustainable forest management in the project area, and will also attract the participation of public officers and community members from other departments at the national level.

The MINCABAMBU Centre will provide training on non-industrial utilisation of bamboo for the manufacturing of bamboo mats, laminates and furniture. This training will be addressed to local community members, who will be pre-selected on the basis of their individual skills. The Centre's training activities will be coordinated by an international expert consultant and the project technical team.

Activity 1.2.1
Establishment of demonstration plots.

Four (4) 20-hectare demonstration plots will be established in previously identified sites (see Annex 1, Map 2 – Project Area), including basic infrastructure for the nursery propagation (approximately 300 m^2) of bamboo seedlings through the method known as "chusquines". These facilities will be mostly under the responsibility of women. In addition, each plot will contain a pond for bamboo culm preservation.

Plots will be established in Huancabamba (Piura), Florida (Cajamarca), Bagua (Amazonas) and Moyabamba (San Martín), in areas with natural bamboo stands or bamboo plantations located in permanent production forests or in small farms under forest harvesting permits. Target areas will be previously identified in Activity 1.1.1 through a selection process carried out by the community members themselves with the support of non-technical personnel of the project team.

Activity 1.2.2
Rehabilitation and management of forests with bamboo stands.

Degraded forest lands and permanent production forests (covering a total of approximately 120 ha, or 30 ha /department) will be rehabilitated and sustainably managed, with the direct and active participation of duly trained local communities following ITTO Guidelines[23] and other technical documents specialised on bamboo.

Local communities, concession holders and owners of forest areas to be rehabilitated and/or managed will actively participate in silvicultural and tendering operations under the technical guidance of the project team.

The project executing agency will prepare a guidelines proposal to develop a Management Plan for forests with bamboo stands, which will be submitted to the relevant authority for consideration as appropriate. Evaluation visits will be carried out on a regular basis (at least every 3 months) to monitor the rehabilitation and management of forests in the project area. Visits will also be made at the request of local community members for the purposes of identifying any weaknesses, recommend necessary corrective measures and strengthen project beneficiaries' skills. The second evaluation will be carried out with the participation of a consultant specialised in management of Amazon bamboo species.

[23] ITTO – Policy Development Series No. 13. Developed in cooperation with CIFOR, FAO, IUCN and WWF.
ITTO – Restoring forest landscapes: an introduction to the art and science of forest landscape restoration. ITTO – IUCN Technical Series No. 23.

Activity 1.3.1
Establishment of production chains.

Working in partnership with PRODUCE, the project will promote the establishment of micro and small enterprises. Even though this activity is not directly linked to the project's main objective, it is considered to be necessary to ensure the sustainability of sustainable forest management and rehabilitation activities, which are the focus of the project's specific objective.

Training will be provided by experts in the relevant fields within the framework of the workshops to be implemented under activity 1.1.3. The Project Coordinator, with the support of competent bodies, will provide guidance to community members interested in setting up production chains during the establishment process and corresponding legal registration. This process will continue during Year 2 of the project for the formalisation of at least 4 production chains, preferably one (1) per bamboo producing department.

Activity 1.3.2
Promotion, dissemination and evaluation of project impact

In order to encourage the participation of local community members, both in rehabilitation and in management and processing activities, local and regional competitions (2) will be conducted to reward the best contribution to the achievement of project outputs as well as the design and quality finishing of products by project beneficiaries. The assessment will be done by a panel of judges designated by PROMPEX, the School of Fine Arts, and ADEX, among others.

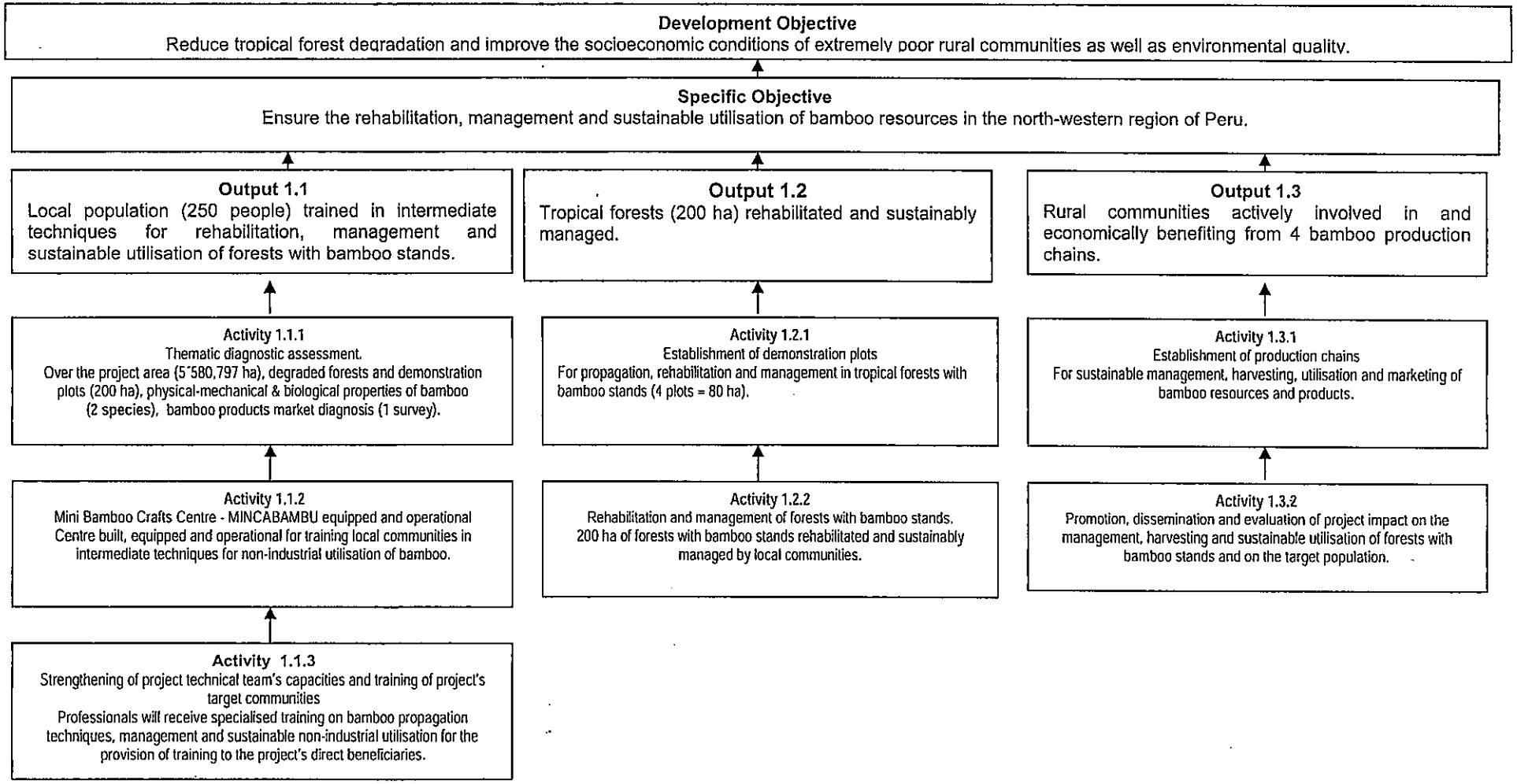
All bamboo products selected for their quality and design will be promoted on the Internet through the web pages of the various organisations involved in the implementation of the project. The development of the relevant pages will be under the responsibility of the competent agencies – PRODUCE and PROMPEX.

A manual will be produced on intermediate techniques for degraded forest rehabilitation[24], and sustainable management and harvesting of forests with bamboo stands[25] (1000 copies) for training of and dissemination among project participants. The manual will be written in plain language and will include charts and adequate examples of the culture and language of the project's target population. The manual will also describe ITTO's Objective 2000 using simple language, and will also contain a description of certain aspects of the forestry legal framework so as to contribute to the prevention of illegal logging and to sustainable forest management.

Project technicians will seize every opportunity to appear in radio and TV programs to promote project activities, particularly its objectives and its significant contribution to environmental conservation and local socioeconomic development, as well as explaining simple technical aspects of the rehabilitation and sustainable management of tropical forests with bamboo stands.

An external consultant will carry out a final evaluation of the impact of rehabilitation, management and utilisation activities implemented in forests with bamboo stands on the socioeconomic level of direct beneficiaries and on the status of environmental rehabilitation in the project area.

[24] Based on the ITTO/IUCN Manual.
[25] Based on INBAR's TOTEMs and grey information from various Latin American professionals.


Development Objective
Reduce tropical forest degradation and improve the socioeconomic conditions of extremely poor rural communities as well as environmental quality.
Specific Objective
Ensure the rehabilitation, management and sustainable utilisation of bamboo resources in the north-western region of Peru.
Output 1.1
Local population (250 people) trained in intermediate techniques for rehabilitation, management and sustainable utilisation of forests with bamboo stands.
Output 1.2
Tropical forests (200 ha) rehabilitated and sustainably managed.
Output 1.3
Rural communities actively involved in and economically benefiting from 4 bamboo production chains.
Activity 1.1.1
Thematic diagnostic assessment.
Over the project area (5'580,797 ha), degraded forests and demonstration plots (200 ha), physical-mechanical & biological properties of bamboo (2 species), bamboo products market diagnosis (1 survey).
Activity 1.2.1
Establishment of demonstration plots
For propagation, rehabilitation and management in tropical forests with bamboo stands (4 plots = 80 ha).
Activity 1.3.1
Establishment of production chains
For sustainable management, harvesting, utilisation and marketing of bamboo resources and products.
Activity 1.1.2
Mini Bamboo Crafts Centre - MINCABAMBU equipped and operational
Centre built, equipped and operational for training local communities in intermediate techniques for non-industrial utilisation of bamboo.
Activity 1.2.2
Rehabilitation and management of forests with bamboo stands.
200 ha of forests with bamboo stands rehabilitated and sustainably managed by local communities.
Activity 1.3.2
Promotion, dissemination and evaluation of project impact on the management, harvesting and sustainable utilisation of forests with bamboo stands and on the target population.
Activity 1.1.3
Strengthening of project technical team's capacities and training of project's target communities
Professionals will receive specialised training on bamboo propagation techniques, management and sustainable non-industrial utilisation for the provision of training to the project's direct beneficiaries.

5. LOGICAL FRAMEWORK MATRIX

PROJECT ELEMENTS	INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
Development objective Reduce tropical forest degradation and improve the socioeconomic conditions of extremely poor rural communities as well as environmental quality.	Degraded forests and forest lands in the project area have been rehabilitated, are being sustainably managed and the local communities have improved their socioeconomic and environmental conditions.	Forests rehabilitated, managed and sustainably utilised. Improved income levels for the communities. Project final technical report. INRENA's institutional report.	Ongoing support from local, regional and national governments for the development of the forest sector with a view to alleviating poverty and promoting the development of rural communities. Involvement and active participation of rural communities in the sustainable management, use and processing of bamboo resources.
Specific objective Ensure the rehabilitation and management of degraded or endangered tropical forests and improve the socioeconomic and environmental conditions of local communities living in poverty in the north-western region of Peru.	Number of hectares of rehabilitated and sustainably managed forest and number of local communities utilising and successfully marketing value-added bamboo products.	Demonstration plots have been established and are being managed by local communities using and/or marketing bamboo products from sustainable sources. Technical progress reports.	Active participation of all project stakeholders /beneficiaries, technicians and policy-makers. Timely availability of required inputs.
Output 1.1 Local population (250 people) trained in intermediate techniques for rehabilitation, management and sustainable utilisation of forests with bamboo stands.	Number of local community members trained in rehabilitation and sustainable management of forests with bamboo stands and number of people trained in intermediate techniques for utilisation of bamboo in value added processing.	Technical progress reports. 250 local community members trained. 1 Pilot Centre and 4 demonstration plots established and operational.	Timely availability of required inputs. Timely acquisition of materials and equipment.
Activity 1.1.1 Thematic diagnostic assessment.	Thematic diagnosis report for the project area. Results of biological, physical-mechanical evaluation, market and marketing survey, and ex-ante socioeconomic evaluation.	Copies of reports. Location of demonstration plots and identified degraded permanent production forests. Bamboo species to be used in the project have been identified and their properties are known. Evaluation reports.	Timely disbursements and availability of required inputs.
Activity 1.1.2 Strengthening of project technical team's capacities and training of project's target communities.	Number of technical team members trained in techniques relevant to the project.	Copies of reports on training events.	Training courses are implemented according to schedule.

PROJECT ELEMENTS	INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
Activity 1.1.3 Mini Bamboo Crafts Centre - MINCABAMBU built, equipped and operational.	Pilot Centre built, equipped and operational.	Report on centre building and equipping.	Timely acquisition of materials and equipment.
Output 1.2 Tropical forests (200 ha) rehabilitated and sustainably managed.	Area of rehabilitated tropical forests.	Technical progress report.	Physical and biological characteristics of degraded forests.
Activity 1.2.1 Establishment of demonstration plots.	Number of demonstration plots established and operational.	Reports documented and four 20-ha demonstration plots established and operational.	Complete technical information available. Active participation of local communities.
Activity 1.2.2 Rehabilitation and management of forests with bamboo stands.	Total area of rehabilitated tropical forests.	Reports on rehabilitation of 120 ha of tropical forests with bamboo stands. Guidelines proposal for Bamboo Management Plan. INRENA's official reports.	The communities implement suggested guidelines for the rehabilitation and sustainable management of bamboo resources.
Output 1.3 Rural communities actively involved in and economically benefiting from 4 bamboo production chains.	Number of production chains operating and number of people directly and indirectly benefiting from them.	Number of local community members participating in the project who have improved their socioeconomic conditions.	Timely availability of financial and technical resources.
Activity 1.3.1 Establishment of production chains.	Number of production chains established.	Reports on the establishment of legally validated production chains. 4 production chains operating.	Prompt adoption of intermediate technology by "beneficiaries". Support from relevant public institutions.
Activity 1.3.2 Promotion, dissemination and evaluation of project.	Project's beneficiary population is equal to or exceeds the target for this activity. Local and regional authorities support and disseminate project objectives. Project beneficiaries have improved their income levels.	Report on promotion events (2 trade fairs and 1 regional competition). Bamboo products made by project beneficiaries are marketed. Reports of project impact in other regions of the country.	Support from local and regional public and private institutions. Active participation of project beneficiaries. Positive market response to bamboo products produced by project beneficiaries. The communities that are not direct project beneficiaries are receptive to project results.

6. QUARTERLY AND MONTHLY WORK PLAN BY OUTPUT/ACTIVITY

		Year 1 (in quarters)				Year 2 (in quarters)				Year 3 (in quarters)			
OUTPUTS/ACTIVITIES	Responsible Party	1	2	3	4	1	2	3	4	1	2	3	4
OUTPUT 1.1 Local population (250 people) trained in intermediate techniques for rehabilitation, management and sustainable utilisation of forests with bamboo stands.													
Activity 1.1.1 Thematic diagnostic assessment.	C/PEU/PB												
Activity 1.1.2 Strengthening of project technical team's capacities and training of project's target communities.	PEU/PB												
Activity 1.1.3 MINCABAMBU built, equipped and operational.	SC/PEU/PB												
OUTPUT 1.2 Tropical forests (200 ha) rehabilitated and sustainably managed.													
Activity 1.2.1 Establishment of demonstration plots.	PEU/INRENA												
Activity 1.2.2 Rehabilitation and management of forests with bamboo stands.	PEU/INRENA												
OUTPUT 1.3 Rural communities actively involved in and economically benefiting from 4 bamboo production chains.													
Actividad 1.3.1 Establishment of production chains.	PROD/EA												
Actividad 1.3.2 Promotion, dissemination and evaluation of project.	PEU/PB												

Abbreviations:

C/PEU/PB:	Consultant with PERUBAMBU's support and under EA's supervision
SC/EA:	Subcontractor with PERUBAMBU (PB) and EA support and participation
PEU/SC:	Project Executing Unit with support from subcontractor
PEU/C:	Project Executing Unit with support from consultant
MINCABAMBU:	Mini Bamboo Crafts Centre

7. BUDGET

7.1 CONSOLIDATED BUDGET BY FINANCING SOURCE

BUDGET COMPONENT	Unit	US$ /Unit	ITTO	PERUBAMBÚ	INRENA
PERSONNEL					
Project Personnel					
1 General Coordinator, 36 months	month	1,900	68,400		
1 Forest Management Expert, 34 months	month	1,400	47,600		
1 Forest Industry Expert, 24 months	month	1,200	28,800		
2 Field Assistants, 34 months	month	400	27,200		
1 Pilot Centre Assistant, 24 months	month	400	9,600		
8 Unskilled field staff, 24 months	month	80	15,380		
1 Specialist PERUBAMBU, 36 months	month	1200		43,200	
1 GIS Expert [26] PERUBAMBU, 12 months	month	1000		12,000	
1 Accountant /Administrator PERUBAMBU, 36 months	month	800		28,800	
1 Administrative Assistant PERUBAMBU, 36 months	month	300		10,800	
4 Forest Management Experts INRENA, 36 months	month	500			72,000
1 Forest Projects Expert INRENA, 12 months	month	1200			14,400
			196,980	**94,800**	**86,400**
Specialised Consultants					
Consultant in Bamboo Biology, 1 month	month	3,000	3,000		
Consultant in Socioeconomics, 3 months	month	2,500	7,500		
Consultant in Bamboo Management, 1 month	month	5,000	5,000		
Consultant in Bamboo Crafts, 1 month	month	5,000	5,000		
Consultant in Marketing and Trade, 1 month	month	4,000	4,000		
			24,500		
Fellowships and training					
		2,500 [27]			
Overseas training, 4 technicians	technician		10,000		
Training workshops, 8 events	event	1,500	12,000		
			22,000		
SUBCONTRACTS					
Physical-mechanical evaluation, 24 samples	sample	150	3,600		
Communications and publications, 1000 copies/2 docs	document	7,000	7,000		
Design of MINCABAMBU, 1	document	3,000		3,000	
Construction of MINCABAMBU, 1	site	10,000	10,000		
			20,600	**3,000**	
DUTY TRAVEL [28]					
National air travel, Consultants (6)	**fares**	**200**	**2,400**		
National air travel, Consultative Committee (6)	**fares**	**20**	**10,000**		
Land transport, 40 beneficiaries x 10 trips	**fares**				
Land transport, 4 technicians/INRENA x 25 trips	**fares**				
Other transport costs: 144 tolls	**ticket**				
National DSA/1000 days: 400/40 beneficiaries					
400/6 Team and Committee, 200/4 INRENA in 34 months	**day**	**22**	**22,000**		
International travel: 3 Consultants x 4 trips	**fares**	**2,000**	**6,000**		
International DSA: 3 Consultants x 90 days	**day**	**80**	**7,200**		
			49,040		
CAPITAL ITEMS					
Forest plots for management	80 ha	200			16,000
Site/land for Pilot Centre	400 m2	40			16,000
Bamboo processing equipment	1 set	15,000	15,000		
Vehicle - 4x4 truck, DC, Diesel	**1 vehicle**	**28,000**	**28,000**		
Computer equipment	2 sets	2,000	4,000	2,000	
Projector	2 units	500	1,000		
Photographic cameras	2 units	400	400		
GPS	2 units	200	400		
Computer Workstation GIS/Admin., scanner & printer	1 unit	12,000		12,000	
Satellite images	30 units	500		15,000	
			48,800	**29,000**	**32,000**

[26] The GIS Expert from PERUBAMBU and the Forest Projects Expert from INRENA will only provide support to the project when their services are required during the project implementation period.

[27] Average cost of fares, training and DSA in Asia and Latin America.

[28] Average cost of national and international travel and DSA.

BUDGET COMPONENT	Unit	US$ /Unit	ITTO	PERUBAMBÚ	INRENA
CONSUMABLE ITEMS					
Seedlings				3,000	
Tools and inputs for propagation and management			12,000		
Material and inputs for preservation			2,000		
Materials for processing			3,000		
Spares			3,000		
Fuel and other			12,000		
Office supplies			6,000	2,200	
Telephone and other services	36 months	300	10,800		
Office space	36 x 2	300			21,600
			48,800	**5,200**	**21,600**
MISCELLANEOUS					
Auditing	1 audit	10,000	10,000		
Sundry	36 months	400	14,400	14,400	
			24,400	**14,400**	
ITTO SUB TOTAL			**420,720**		
EXECUTING AGENCY SUB TOTAL				**146,400**	**140,000**
ITTO ADMINISTRATION, MONITORING & EVALUATION					
Monitoring			30,000		
Evaluation			**15,000**		
ITTO programme support costs			37,258		
			82,258		
ITTO TOTAL (A) US$	**502,978**			**146,400**	**140,000**
EXECUTING AGENCY/INRENA TOTAL (B+C)	**286,400**				
GRAND TOTAL (A+B+C) US $	**789,378**				

JUSTIFICATION OF ITEM 30: (Annex 6A)

31. NATIONAL DSA: for project beneficiaries (travel for purposes other than participating in workshops), technical team, national consultants, INRENA technical personnel and members of the Project's Steering Committee, during the 36 month period of project implementation.

An average DSA of US$ 22,00[29]/day has been estimated throughout the whole project area of influence; despite the fact that the average cost of DSA (accommodation + meals) in the main cities where the most important meetings will be held is US$ 30,00, or US$ 30,00/night for accommodation (3 star hotel) and US$ 15,00/day for meals, in the local communities the average DSA is only US$ 15,00/day/person. An average of 250 trips for 2 persons and 2 days each will be taken in the project area of influence and other places as required at the national level.

32. INTERNATIONAL TRAVEL

The cost of international travel for 3 consultants taking 4 trips, including airfares, air travel in their country of origin, airport taxes in their country of origin and transport to and from airports will be an average of US$ 2,000 each, as shown in the following table:

Handicrafts Consultant	**Sichuan-Lima-Sichuan**	**3,600.00**	**1**	**3,600.00**
Management Consultant	**Cartagena-Lima-Cartagena**	**800.00**	**2**	**1,600.00**
Taxonomy Consultant	**Pereira-Lima-Pereira**	**800.00**	**1**	**800.00**
				6,000.00

INTERNATIONAL DSA: The average DSA cost for the International consultants and the Technical Team during international trips is US$ 80,00/day (accommodation US$ 50,00 and meals + local transport US$ 30,00).

33. TRANSPORT COSTS: (Annex 6 B)

LAND TRANSPORT: Average cost: US$ 20,00/each

This item includes land transport costs for community leaders and women who will participate in the coordination meetings, meetings for the transfer of experiences between beneficiaries, visits to MINCABAMBU, coordination meetings for the formalization and registration of the project beneficiaries' organization to which the project will transfer the facilities and equipment,

[29] US$ 1 = 3.10 New Soles

participation in fairs in the cities of Chiclayo and Lima, and trips for different purposes to the 8 training workshops in management, rehabilitation and primary processing techniques listed in subcomponent 10.14.

The land trip Chiclayo-Lima-Chiclayo costs an average of US$ 63.00 per person, or approximately 3 times the cost of travel inside the project's area of influence. The professional officers in the Technical Team (Coordinator, Management Expert and Industry Expert) will need to travel to the Capital every 3 months to participate in the annual meeting with the ITTO officer responsible for project monitoring and evaluation and to coordinate technical-administrative matters with the relevant authorities in the Capital. The craftsmen selected by the project (approximately 6 people) will travel to Lima to participate in a crafts fair.

JUSTIFICATION OF ITEM 40 (Annex 6 C): Vehicle

The project area covers more than 100,000 km^2, with ecosystems situated from 200 m.a.s.l. to more than 2,800 m.a.s.l. Paved roads are only found between major cities and there are some dirt roads and transitable tracks or forest tracks leading to population centres and forests with bamboo stands, which are generally located at 10 to 40 km from the main road. Rainfall is intense during the 6 months of summer, making it impossible to access the work area with a single traction vehicle. Rental of 4x4 vehicles is very costly and in any case it is not available in the region. Public transport (motor vehicles) only provide services between major cities and have irregular timetables. The trip can take anywhere between 1 hour and 1 day, depending on the destination, route taken and date, making it very difficult to comply with any sort of schedule. Furthermore, these vehicles transport more people than their normal capacity, thus endangering the lives of passengers.

The price quoted for the vehicle, a 4x4 Mitsubishi DC Diesel, was US$ 29,899.94, with an option of converting it to natural gas (natural gas costs 50% less than fossil fuel). Additional quotes were requested and the selected vehicle is a Toyota four-wheel drive truck, with similar characteristics, a lower price and technical service guaranteed throughout the whole project area. The total cost of US$ 28,000 includes the current cost of conversion to natural gas. Four wheel drive vehicles of other manufacturers do not offer technical services and spare parts in the project area.

7.2 YEARLY PROJECT BUDGET BY SOURCE – ITTO

Code	Budget Components	US$ TOTAL	US$ YEAR 1	US$ YEAR 2	US$ YEAR 3
10	**Project Personnel**				
	11. National Experts	181,600	48,600	68,400	64,600
	12. National Consultants	11,500	9,000		2,500
	13. Other labour	15,380	6,835	6,835	1,710
	14. Fellowships and training	22,000	16,000	3,000	3,000
	16. International Consultants	13,000	8,000	5,000	
	19. Component Total	**243,480**	**88,435**	**83,235**	**71,810**
20	**Subcontracts**				
	21. Subcontract (with A) – Physical properties	3,600	3,600		
	22. Subcontract (with B) – Publications	7,000	1,000	3,000	3,000
	23. Subcontract (with C) – Construction of Pilot Centre	10,000	10,000		
	29 Component Total	**20,600**	**14,600**	**3,000**	**3,000**
30	**Duty Travel**				
	31 National DSA, 36 months	22,000	6,000	11,000	5,000
	32 International travel (fares and international DSA)	**13,200**	**12,000**		**1,200**
	33 Transport costs (land travel, airfares, toll fees)	13,840	3,840	6,000	4,000
	39 Component Total	**49,040**	**21,840**	**17,000**	**10,200**
40	**Capital Items**				
	43. Vehicle - 4x4 truck, DC, Diesel	**28,000**	**28,000**		
	44. Processing equipment	15,000	15,000		
	45. Office equipment	5,800	5,800		
	49. Component Total	**48,800**	**48,800**		
50	**Consumable Items**				
	51. Materials and tools	17,000	10,000	5,000	2,000
	52. Spares	3,000	500	1,500	1,000
	53. Fuel and utilities	12,000	4,500	4,000	3,500
	54. Office supplies	6,400	4,000	1,000	1,000
	56. Telephone and other services	10,800	3,600	3,600	3,600
	59. Component Total	**48,800**	**22,600**	**15,100**	**11,100**
60	**Miscellaneous**				
	62. Auditing	10,000			10,000
	70. Component Total	**10,000**			**10,000**
	Subtotal - Components 10 to 70				
80	**ITTO Administration, monitoring & evaluation**				
	81. Monitoring costs	30,000			
	82. Programme support costs	37,258			
	83. Evaluation costs	**15,000**			
	89. Component Total	**82,258**			
100	**ITTO GRAND TOTAL**	**502,978**			

7.3 YEARLY PROJECT BUDGET BY SOURCE – EXECUTING AGENCY /PERUBAMBU

Code	Budget Components	US$ TOTAL	US$ YEAR 1	US$ YEAR 2	US$ YEAR 3
10	Project Personnel	94,800	31,600	31,600	31,600
20	Subcontracts	3,000	3,000		
30	Duty Travel				
40	Capital Items	29,000	29,000		
50	Consumable Items and Services	5,200	5,200		
60	Miscellaneous	14,400	4,800	4,800	4,800
	EXECUTING AGENCY TOTAL - PERUBAMBU	**146,400**	**73,600**	**36,400**	**36,400**

7.4 YEARLY PROJECT BUDGET BY SOURCE – HOST GOVERNMENT /INRENA

Code	Budget Components	US$ TOTAL	US$ YEAR 1	US$ YEAR 2	US$ YEAR 3
10	Project Personnel	86,400	28,800	28,800	28,800
20	Subcontracts				
30	Duty Travel				
40	Capital Items	32,000	32,000		
50	Consumable Items and Services	21,600	7,200	7,200	7,200
60	Miscellaneous				
	HOST GOV'T - INRENA TOTAL	**140,000**	**68,000**	**36,000**	**36,000**

7.5 PROJECT BUDGET BY ACTIVITY AND COMPONENT – ITTO CONTRIBUTION (US$)

OUTPUT /ACTIVITIES + Non-activity based expenses	10. Project Personnel	20.Sub-contracts	30. Duty Travel	40. Capital Items	50. Consumable Items	60. Miscellaneous	70. Management Costs.	GRAND TOTAL	QUARTER /YEAR
Output 1.1 Local population (250 people) trained in intermediate techniques for rehabilitation, management and sustainable utilisation of forests with bamboo stands.									
Activity 1.1.1 Thematic diagnostic assessment.	14,374	3,600	5,800	**28,000**	1,450			73,198	Q1-2/1
Activity 1.1.2 Strengthening of PEU capacities and training of local communities	121,616		**25,760**	5,800	12,180			167,356	Q2 to Q4/1 & Q3/1 to Q4/2
Activity 1.1.3 Pilot centre equipped and operational.	18,300	10,000	1,200	15,000	3,270			47,770	Q4/1 & Q1/2 to Q3/3
Subtotal:	154,290	20,600	34,760	50,800	16,900			288,324	
Output 1.2 Tropical forests (200 ha) rehabilitated and sustainably managed.									
Activity 1.2.1 Establishment of demonstration plots.	33,290		4,140		10,270			47,700	Q2/1 to Q2/2
Activity 1.2.2 Rehabilitation and management of forests with bamboo stands.	28,400		4,140		9,247			41,787	Q3/1 to Q2/3
Subtotal:	61,690		14,080		19,517			89,487	
Output 1.3 Rural communities (2000 people) actively involved in and economically benefiting from (4) bamboo production chains.									
Activity 1.3.1 Establishment of production chains.	7,100		2,900		2,500			12,500	Q1/2 to Q4/2
Activity 1.3.2 Promotion, dissemination and evaluation	20,400		4,100		4,340			28,840	Q4/1 to Q3/3, Q1/1 & Q3/3
Subtotal:	27,500		7,000		6,840			41,340	
AUDITING						10,000		10,000	Q4/3
Components Total	243,480	20,600	**49,040**	**48,800**	48,800	10,000		**420,720**	
ITTO Monitoring and evaluation							30,000		
ITTO Ex-Post Evaluation							**15,000**		
ITTO Administration (Programme support costs)							**37,258**		
GRAND TOTAL	**243,480**	**20,600**	**49,040**	**48,800**	**48,800**	**10,000**	**82,258**	**502,978**	

PART III: OPERATIONAL ARRANGEMENTS

1. PROJECT MANAGEMENT STRUCTURE

The project executing agency will be the Peruvian Association for Bamboo (Asociación Peruana del Bambú) – PERUBAMBU, a non-profit organisation with expertise in environmental and rural development projects related to bamboo and other timber and non-timber forest species. Even though this organisation was established a relatively short time ago, its Executive Director[29] has extensive experience in the field; has participated in specialised courses on rural development policies based on non-timber resources with special emphasis on bamboo, non-industrial production of high value-added bamboo products, and sustainable management of bamboo resources, convened in the Peoples Republic of China; has been a speaker at several international events on bamboo; has coordinated participatory planning and Amazon rural development projects; and has conducted consultancies on environmental issues at the international level. Since 2002, she has been a member of INBAR's Board of Directors, and her appointment has recently been renewed up to the year 2008.

PERUBAMBU has signed an inter-institutional cooperation agreement with the National Institute for Natural Resources – INRENA of the Ministry of Agriculture and will receive support from the Ministry of Production, the Ministry of Foreign Trade and Tourism, Regional and Local Governments, and non-governmental organisations in the project area.

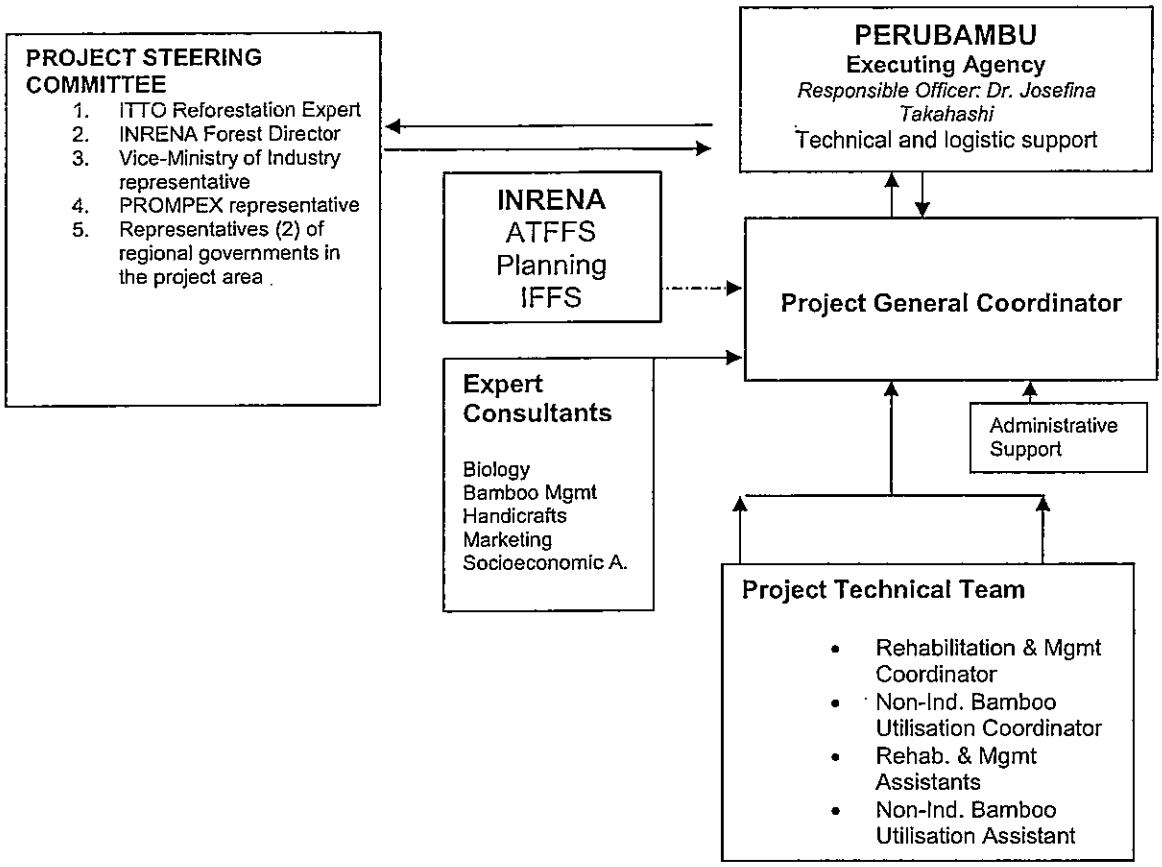
A Project Steering Committee will be established to evaluate and guide all activities geared to the achievement of project objectives. This Committee will be made up of representatives from the main institutions involved in the project. The PSC should guide and consult with the executing agency from the project proposal development phase and should meet at least twice a year to evaluate project progress.

INRENA is the public body responsible for renewable natural resources and ITTO's focal point. After having signed a cooperation agreement with PERUBAMBU for the implementation of projects related to non-timber forest species, particularly bamboo, INRENA has entrusted PERUBAMBU with the implementation of this project. In addition to the regular evaluation and monitoring of achievement of project objectives and goals, the Institute, through its local Forestry and Wildlife Administrations, will provide support for the implementation of training and technology transfer activities addressed to rural communities and will also provide information on concession holders, native communities and agroforestry farm owners that may participate in project activities.

PERUBAMBU, as the agency responsible for the technical and administrative implementation of the project, will coordinate with INRENA and all other relevant organisations at the national, regional and local levels to ensure the achievement of project objectives. The Project General Coordinator will be appointed by PERUBAMBU subject to ITTO's approval ("no objection"). The Project Coordinator will be responsible for the implementation of the project and will ensure the achievement of its objectives with the support of a specialised technical team who should have proven experience in project-related issues. The Experts in Management and Industry will be responsible for activities aimed at the achievement of outputs related to the project's specific objective with the support of expert consultants in the relevant fields during both the diagnosis and implementation phases.

[29] Josefina Takahashi Sato, PhD in Biological Science.

PROJECT ORGANISATIONAL CHART



2. FUTURE OPERATION AND MAINTENANCE

INRENA and the Regional Governments will include project follow-up and monitoring costs in their future annual operational plans and budgets so as to ensure the continuity of project activities and thus guarantee their sustainability. To this end, PERUBAMBU will provide technical assistance to the relevant government agencies for a period of up to 3 years after project completion.

With regard to the direct beneficiaries of the project's capital items, it is expected that demonstration plots including forest species propagation nurseries will be transferred to local organisations of trained women who would have actively participated in the implementation of the project. These organisations will be responsible for the administration of these assets for their own benefit and for the benefit of the local communities living in poverty. The relevant government agency will be in charge of this transfer.

The equipped Pilot Centre will be transferred, under an administration contract with the competent authorities, to project beneficiary craftsmen, who will establish a legal association for this purpose. They will be responsible for the maintenance and future sustainable operation of the Centre and will guarantee its availability for the training of other community members in the region as required.

The Project Executing Agency will keep all other capital items to be used as established by its By-Laws and the Agreement signed with INRENA.

3. Key Staff

The project key staff will include three professionals – a National Consultant (General Coordinator), a Forest Management Expert and a Forest Industry Expert. The qualifications and duties of these 3 professionals are briefly described in Annex 2. In addition, the project will be assisted by International Consultants in Bamboo Management, Bamboo Crafts, Bamboo Biology, Socioeconomics and Marketing, as well as support staff from PERUBAMBU and INRENA.

The following table shows project personnel requirements:

POSITION	US$ /MONTH	DURATION	TOTAL (US$)
01 General Coordinator	1,900	36 months	68,400
01 Forest Management Expert	1,400	34 months	47,600
01 Forest Industry Expert	1,200	24 months	28,800
02 Management Assistants /Driver	400	34 months	27,200
01 Pilot Centre Assistant	400	24 months	9,600
01 PERUBAMBU Liaison Assistant	1,200	36 months	43,200
01 GIS Specialist	1,000	12 months	12,000
01 Administrator /Accountant – PERUBAMBU	800	36 months	28,800
01 Administrative Assistant – PERUBAMBU	300	36 months	10,800
04 Forest Management Technicians – INRENA	500	36 months	72,000
01 Projects Expert – INRENA	1,200	06 months	7,200
08 Unskilled field staff	80	24 months	15,380
TOTAL			**363,780**

4. Prior obligations and pre-requisites

PERUBAMBU, in conjunction with INRENA as the representative of the Peruvian Government before ITTO, will be responsible for all preliminary activities and for the conclusion of a Project Implementation Agreement. PERUBAMBU will assign key and support personnel to the project.

The Project General Coordinator will be recruited subject to ITTO's approval ("no objection"). The members of the Technical Team will be recruited directly by the Project General Coordinator with the approval of PERUBAMBU's Executive Director.

At the beginning of each year, the Project General Coordinator, with the support of the Project Technical Team, will prepare yearly plans of operation (YPO), which will be submitted to the Steering Committee for evaluation and approval.

5. Possible future actions

Upon project completion, PERUBAMBU and INRENA will continue disseminating project achievements in the rehabilitation and sustainable management of bamboo resources, as well as in bamboo non-industrial processing techniques. To this end, the institutions will use their own resources as well as funding from other sources.

The Project Executing Unit (PEU) will provide INRENA with the necessary information to replicate its achievements and contribute to the solution of future problems that project beneficiaries may face in technical aspects related to project objectives.

INRENA and PERUBAMBU will use different means of communication to continue disseminating the techniques used in the project but will particularly focus on the promotion of partnerships between local NGOs, communities and/or small farmers groups involved in the Project and similar organisations in the region or other regions of the country, with a view to developing a network of bamboo stakeholders. Therefore, project beneficiaries will become trainers and promoters of the benefits of rehabilitation, management and sustainable utilisation, thus contributing to strengthening the results obtained and their sustainability.

PERUBAMBU and the Vice-Ministry of Industry will continue promoting and coordinating the implementation of the "National Plan for Integrated Bamboo Development", with the support of agencies such as PROMPYME (Promotion of Micro and Small Enterprises of the Ministry of Labour); PROMPEX (Promotion of Exports); and ADEX (Exporters' Association). PERUBAMBU and the Ministry for Housing and Construction,

in coordination with other agencies in the health and education sectors, will continue promoting and coordinating the construction of housing and social service facilities (medical centres and rural schools) with bamboo in various areas of the country.

6. Monitoring, reporting and evaluation

a) Bimonthly and yearly project progress reports

The Project Executing Agency will submit reports to ITTO on a six-monthly and yearly basis in accordance with the ITTO Manual for Project Formulation. These reports will be assessed by the Project Steering Committee before their submission to ITTO. The reports should contain information on progress made in each project activity and should be prepared at least 4 weeks before the date of each scheduled monitoring visit. Report documents will be prepared following the format established for progress reports in the ITTO Manual for Project Formulation (1999), Annexes B and C.

PART IV: THE TROPICAL TIMBER FRAMEWORK

1. Compliance with ITTA 1994 objectives

This project is consistent with ITTO Objectives and Criteria, Action Plan and ITTA 1994 and the new Agreement approved in February 2006, which recognises the role of the Organisation in supporting member countries for the implementation of programs aimed at development of research so as to improve the management of tropical forests and efficient utilisation of their timber and non-timber forest resources in order to increase the capacity for conservation and efficient utilisation, processing and trade of forest products on a sustainable basis and thus contribute to equitable socioeconomic development and sustainable forest management.

The International Tropical Timber Council – ITTC has adopted Action 3, Goal 2 of the Libreville Action Plan in the field of Reforestation and Forest Management as well as Decision 7(XXV) on the 1999 ITTO Work Programme for the Reforestation and Forest Management Committee, which in its item (ii) stipulates the development of guidelines for the rehabilitation of degraded forests and forest lands, including guidelines for secondary forest management. Based on this resolution, ITTO has developed guidelines for the rehabilitation and management of secondary forests and degraded primary forests in the tropics. These guidelines are aimed at providing a knowledge base on key policy, socioeconomic, legal, institutional and ecological issues that should be taken into consideration when planning and implementing valid and viable strategies for the rehabilitation of degraded primary forests, the sustainable management of secondary forests, and the rehabilitation of degraded forest lands.

The International Tropical Timber Agreement approved in 2006, in its Article I on Objectives, establishes the need to promote the sustainable management of timber producing forests by: c) Contributing to sustainable development and poverty alleviation; j) Encouraging members to support and develop tropical timber reforestation, as well as rehabilitation and restoration of degraded forest land, with due regard for the interests of local communities dependent on forest resources; q) Promoting better understanding of the contribution of non-timber forest products and environmental services to the sustainable management of tropical forests with the aim of enhancing the capacity of members to develop strategies to strengthen such contributions in the context of sustainable forest management, and cooperating with relevant institutions and processes to this end; and r) Encouraging members to recognize the role of forest -dependent indigenous and local communities in achieving sustainable forest management and develop strategies to enhance the capacity of these communities to sustainably manage tropical timber producing forests. Article 15 on "Cooperation and Coordination with Other Organizations" stipulates that in pursuing the objectives of the Agreement, the Organization shall, to the maximum extent possible, utilize the facilities, services and expertise of intergovernmental, governmental or non-governmental organizations, civil society and the private sector in order to avoid duplication of efforts and to enhance the complementarity and the efficiency of their activities.

2. Compliance with the ITTO Yokohama Action Plan (2002-2006)

This project is consistent with the following goals established for the Reforestation and Forest Management Committee:

GOAL 1: Support activities to secure the tropical timber resource base.

Actions

4. Promote the conservation, rehabilitation and sustainable management of threatened forest ecosystems, *inter alia* mangroves, in collaboration with relevant organizations.
5. Assess opportunities for, and promote development of, non-timber forest products and forest services which can improve the economic attractiveness of maintaining the forest resource base.
7. Encourage members and assist them, where appropriate, to:
    - Develop innovative mechanisms and relevant legislative frameworks, including incentives and market-based instruments, to secure and expand, where appropriate, the forest resource base;
    - Secure the forest resource base through the implementation of forest policy, legislation and associated strategies, revised and updated where appropriate, which address:
        - Land use planning which defines forests appropriate for production and provides sufficient representation through protected, reserved and conservation areas to ensure biodiversity conservation and watershed protection;
        - National guidelines and regulations for forest utilization which ensure local stakeholder rights and secure conservation and environmental services.

GOAL 2: Promote sustainable management of tropical forest resources.

Actions

2. Promote the implementation of sustainable forest harvesting, including RIL.
5. Monitor and assess the environmental, social and economic costs and benefits of forest plantation development and utilize that information to promote, where appropriate, new plantations within the ITTO Guidelines for the Establishment and Sustainable Management of Planted Tropical Forests.
10. Encourage members and assist them, where appropriate, to:
    - Improve the formulation and implementation of plans for sustainable forest management, with particular emphasis on harvesting limits;
    - Implement appropriate forest harvesting, including RIL, as a component of sustainable forest management;
    - Improve the productive capacity of natural forests, where appropriate, through intensified silvicultural practices, better utilization of lesser-used species, the promotion of non-timber forest products, guided natural regeneration, enrichment planting and reforestation;
    - Implement research and development activities in the management of secondary tropical forests, restoration of degraded tropical forests and rehabilitation of degraded forest land, taking into consideration ITTO guidelines;
    - Establish and manage forests for multiple uses in close cooperation with local forest owners and communities living in forest areas;
    - Promote and support research in forest dynamics (growth and yield studies) in different forest types and under various management schemes;

Furthermore, the project is also consistent with the following goals established for the Committee on Forest Industry:

GOAL 1: Promote increased and further processing of tropical timber from sustainable sources.

Actions

5. Encourage members and assist them, where appropriate, to;
    - Undertake sector-wide training needs analyses; development of training strategies, training facilities and course curricula; preparation of training manuals; and delivery of training courses.

GOAL 2: Improve industry's efficiency of processing and utilization of tropical timber from sustainable sources.

Actions

5. To the extent possible given the Organization's primary focus on timber, develop, publish and disseminate techniques and technologies on product development for and the utilization efficiency of non-timber forest products.
8. Encourage members and assist them, where appropriate, to:
    - Formulate research and development of proposals that assist with the piloting and commercialisation of improved and/or innovative utilization methodologies, including the reduction of losses and increased use of residues and recycling.

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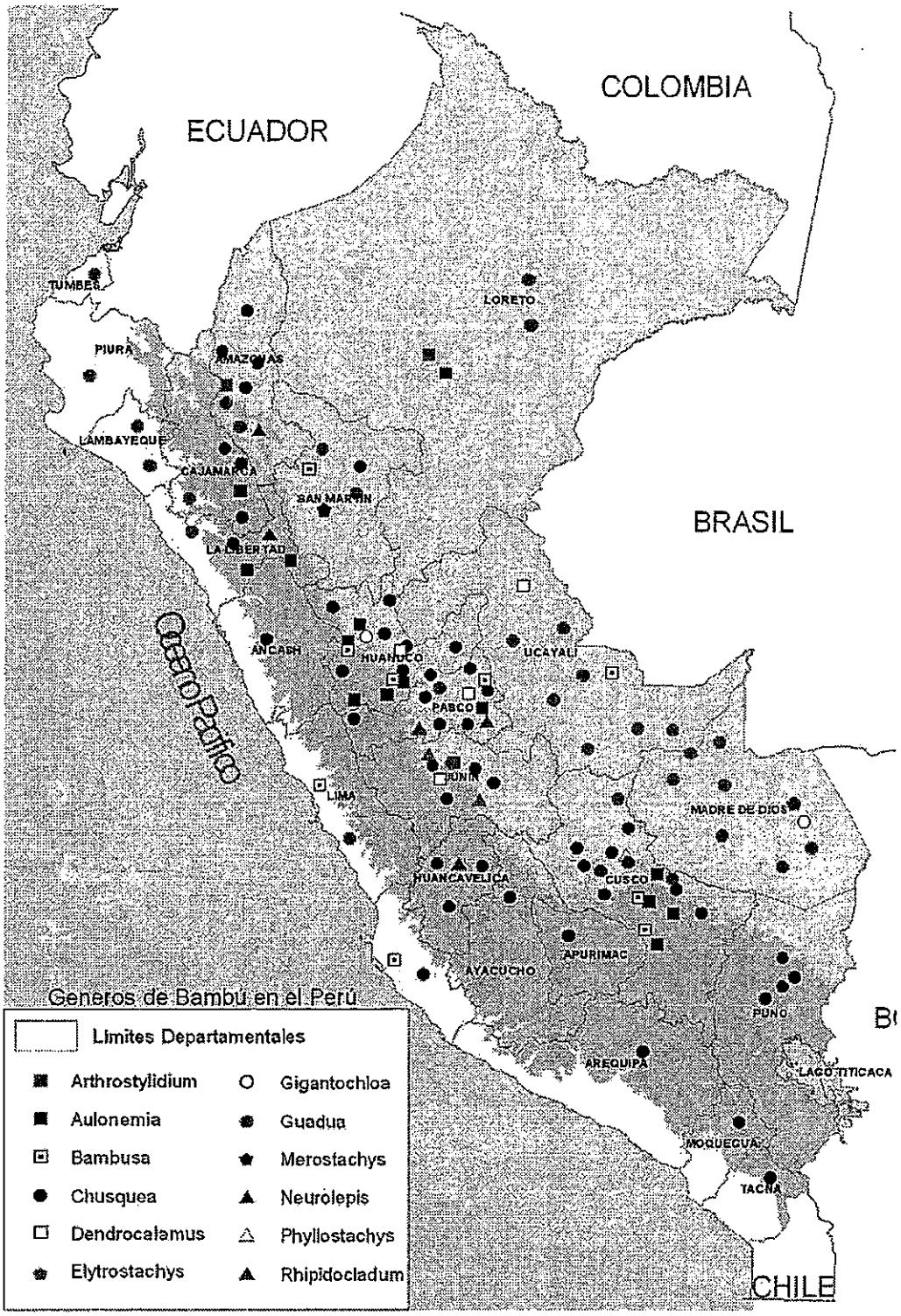
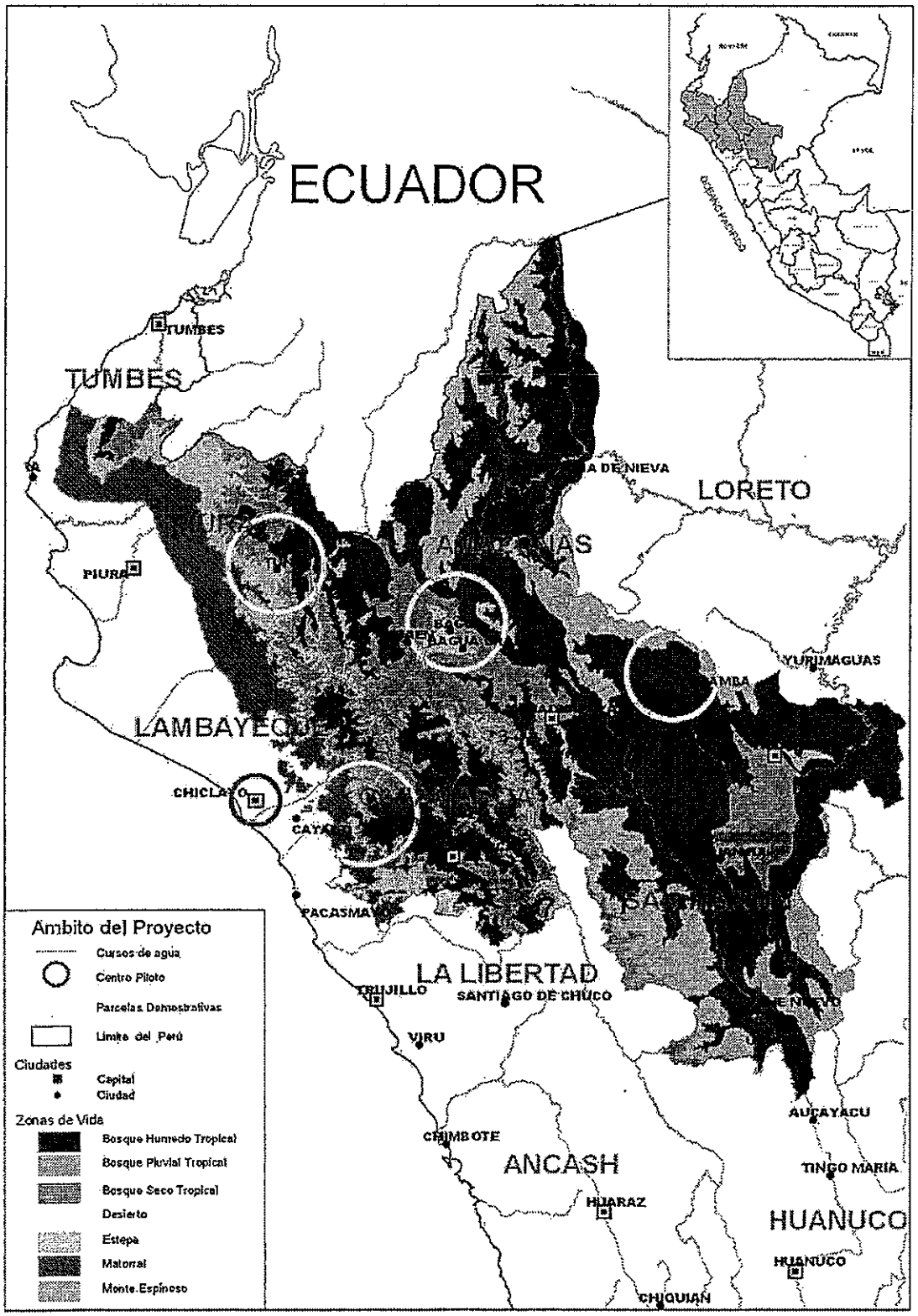
ANNEX 1

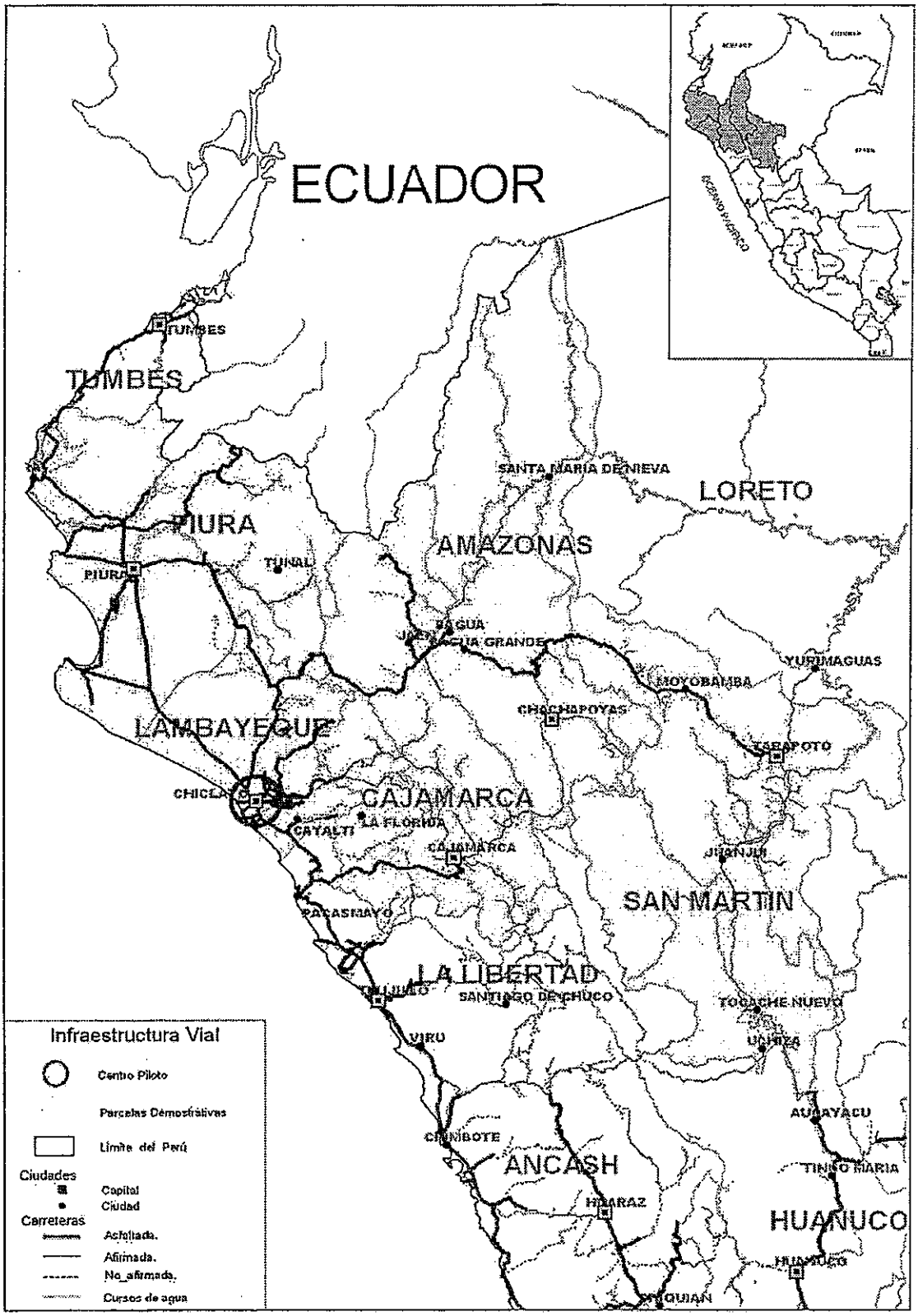
MAP 1: DISTRIBUTION OF MAIN NATIVE AND EXOTIC BAMBOO SPECIES IN PERU



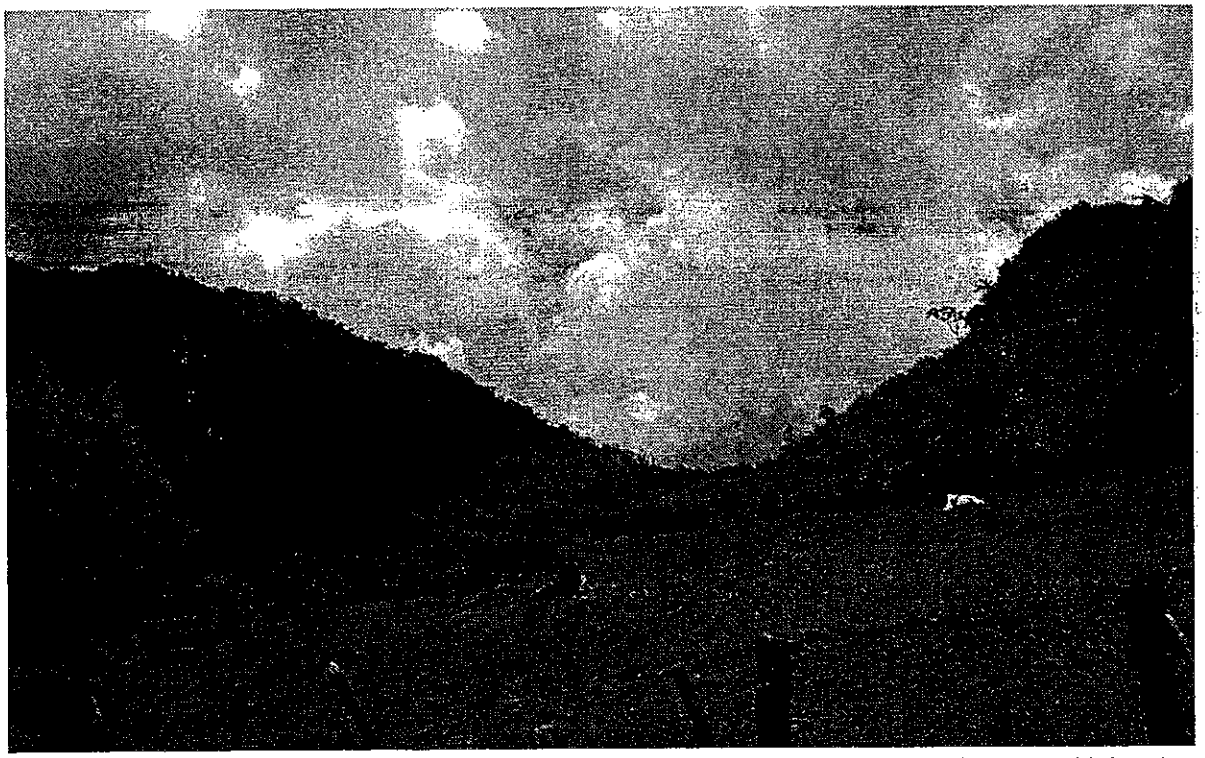
MAP 2: PROJECT AREA INCLUDING LOCATION OF DEMONSTRATION PLOTS AND BAMBOO PILOT CENTRE



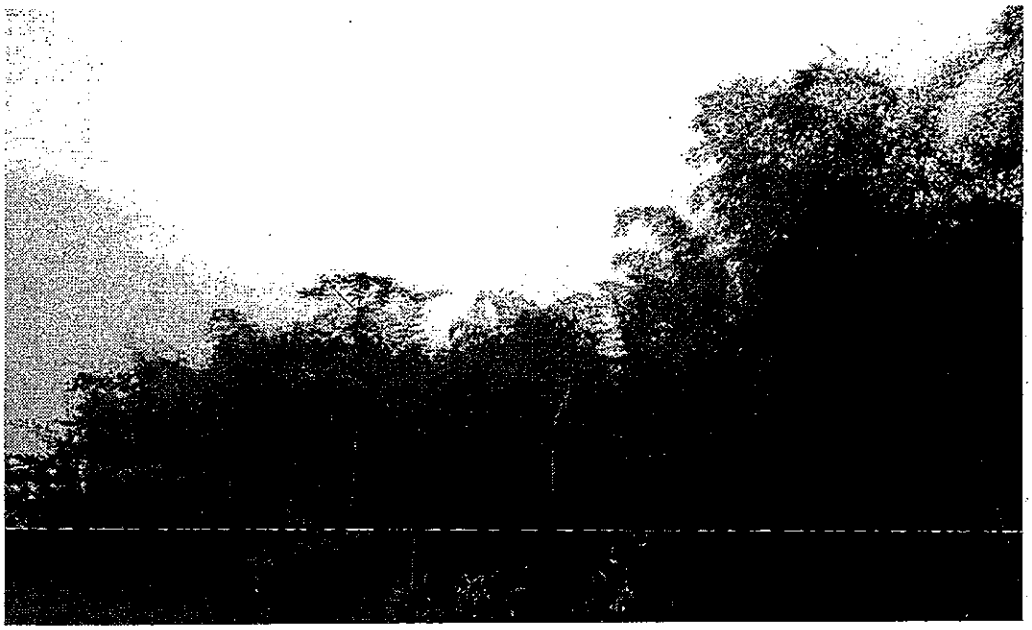
MAP 3: MAJOR ROAD NETWORK IN THE PROJECT AREA



ANNEX 2 – PHOTOS OF THE PROJECT AREA



Above: Rice fields on lands mainly suitable for forestry adjacent to degraded tropical forests with bamboo stands. **Below:** Degraded forest lands used for grazing. Background: secondary tropical forest in the buffer zone of the Alto Mayo Protection Forest.



Above: Overall view of primary forests with bamboo stands.
Left: Bamboo stands inside a primary forest.

Below: Bamboo culms of different ages harvested from natural forests through unsustainable management practices.

ANNEX 3

TERMS OF REFERENCE FOR NATIONAL AND INTERNATIONAL CONSULTANTS

The project team will comprise 8 professionals, national experts and national and international consultants, who will be hired for the entire duration of the project or for relatively short periods as required. International and national consultants will be responsible for conducting specialised studies and providing initial training to the project team in bamboo management and processing techniques.

1. PROJECT COORDINATOR

The Project Coordinator should be a high-level professional, preferably with a post-graduate degree, with experience in the management of rural development projects. He/she should have at least 10 years experience in the management of natural resources, training and transfer of technology to indigenous community members, small farmers and forest concession holders, including women and young people.

Duties:

1. Coordinate project personnel and guide technical and administrative activities as required for the implementation of activities scheduled in the work plan.
2. Plan and coordinate the implementation of the project in close coordination with INRENA technicians, Regional Agrarian Directorates, the Amazon Development Programme of the Ministry of Agriculture, the Vice-Ministry of Industry (Ministry of Production), the Ministry of Tourism and Foreign Trade, Regional and Local Governments, the local and national industrial private sector, and NGOs working in programs with similar objectives in the project area.
3. Coordinate the selection of national and international consultants.
4. Supervise the work of national and international consultants and assess their respective reports.
5. Supervise the work of subcontractors, ensuring adequate compliance with the terms of their contracts.
6. Ensure the timely achievement of project outputs and objectives.
7. Coordinate the efficient disbursement of funds and the implementation of the project budget.
8. Monitor project activities throughout the project area and ensure timely preparation of project progress and technical reports as required.
9. Supervise the development and approval of technical and administrative documents and manuals.
10. Supervise and, on behalf of the executing agency, participate in events held for the achievement of project objectives and other events as required.

2. FOREST MANAGEMENT EXPERT

Forest engineer with extensive experience in degraded land rehabilitation and management of moist tropical forests, reforestation, planning and training of native and rural communities.

Duties:

1. Conduct, in close coordination with the Project Coordinator, a thematic diagnostic study of areas where demonstration plots are to be established and forests are to be rehabilitated for sustainable bamboo management.
2. Coordinate with and support the Socioeconomic Expert in the evaluation of the socioeconomic status of rural communities that could potentially benefit from the project.
3. Actively participate in training and technology transfer activities in the relevant field, in conjunction with the Consultant specialised in Bamboo Management in Natural and Planted Forests.
4. Coordinate the implementation of forest nurseries for bamboo propagation.
5. Coordinate and supervise the rehabilitation of degraded tropical forests.
6. Coordinate training workshops with the participation of local communities, promoting the participation of poor young people and women.
7. Coordinate and supervise the implementation of demonstration plots for bamboo management.
8. Promote bamboo plantations and the sustainable management of tropical forests in the project's area of influence.
9. Supervise and participate in the preparation of technical documents and manuals, ensuring their timely dissemination.
10. Any other duties required to promote the achievement of objectives related to the sustainable management of bamboo and other timber and non-timber forest resources.

3. FOREST INDUSTRY EXPERT

Forest or industrial engineer with experience in the processing of timber and non-timber products, preferably with knowledge of bamboo processing.

Duties:

1. In close coordination with the Project Coordinator, collect the information required on physical-mechanical properties of bamboo.
2. Actively participate in training events overseas and with the Expert Consultant to increase his/her knowledge on sustainable utilisation of bamboo.
3. Coordinate the construction of the Bamboo Pilot Centre.
4. In close coordination with the Project Coordinator, conduct the acquisition of equipment, tools and inputs to be used for the Pilot Centre.
5. Coordinate with the Management Expert to ensure the adequate supply of raw materials in terms of quantity, quality and uniformity, as required to standardise bamboo processing processes.
6. In close coordination with the Project Coordinator, evaluate the designs of bamboo products to be used during the training of rural communities.
7. Conduct tests for the adaptation of techniques to bamboo processing.
8. Actively participate in the timely preparation of project reports and manuals.
9. Coordinate activities at the Pilot Centre to ensure its efficient use.
10. Coordinate with the Management Expert the establishment of bamboo production chains.
11. Any other duties required to facilitate the achievement of project objectives in the processing of bamboo into quality products.

4. EXPERT IN BAMBOO BIOLOGY – TAXONOMY

Biologist or forest engineer with experience and international reputation in the identification and physiology of major bamboo species.

Duties:

1. Coordinate the collection of the main bamboo species growing naturally or planted in the project area.
2. Identify bamboo species found in the project area, including varieties of species developing in different ecosystems.
3. Prepare detailed technical reports accompanied with photographs and other information on biological properties so as to facilitate the identification of bamboo species in other areas of the country.

5. EXPERT IN SUSTAINABLE BAMBOO MANAGEMENT

Forest engineer with extensive experience and international reputation in propagation and sustainable management of bamboo resources in natural and planted forests.

Duties:

1. In close coordination with the Project Coordinator and the Management Expert, support the identification of areas for the establishment of demonstration plots.
2. Coordinate, with the support of the Management Expert, a workshop on bamboo propagation and plantations and provide training in management and sustainable utilisation of the most promising bamboo species in the project area.
3. Submit recommendations to the Management Expert on the contents of dissemination manuals.
4. Evaluate, during the final stage of the project, the standard of management by local communities in their natural forest and plantation plots.

6. EXPERT IN BAMBOO PROCESSING

Forest or industrial engineer or craftsman with extensive experience in bamboo processing for the non-industrial production of quality products.

Duties:

1. Conduct, with the support of the Industry Expert, experimental tests for the adaptation of technologies for laminating, weaving and manufacturing of round bamboo with species from the project area.
2. Support the forest industry expert in the selection of equipment and basic tools for the implementation of the Bamboo Pilot Centre.
3. In conjunction with the forest industry expert, conduct training activities on techniques in his/her field of expertise, for the members of the technical team and rural communities.
4. Support the preparation of specific catalogues and manuals.

7. SOCIOECONOMIC EXPERT

Sociologist with studies in economics and extensive experience in development work in the rural areas of the Amazon Region.

Duties:

1. Carry out an ex-ante and ex-post socioeconomic survey for the project.
2. Evaluate the attitude of local communities vis-à-vis project objectives and operational modalities.
3. Develop guidelines for the active participation and involvement of rural communities in the project's production chains.
4. Provide technical assistance to the Project Coordinator and the project technical team as required to ensure the success of the project and improve the socioeconomic conditions of the local communities.

8. EXPERT IN ECONOMICS AND MARKETING

Expert in economics and marketing with a post-graduate academic degree and extensive experience in social development projects in the Amazon Region.

Duties:

1. Assess the national and international market potential of bamboo products with different degrees of processing.
2. Conduct a costing study for 6 products manufactured by the Bamboo Processing Pilot Centre.
3. Evaluate design preferences and trends, prices and markets for bamboo products.
4. Develop a strategy for the marketing of bamboo products in the international market by craftsmen or their representatives.

ANNEX 4

TERMS OF REFERENCE FOR SUBCONTRACTS

- **ASSESSMENT OF PHYSICAL/MECHANICAL PROPERTIES**

Public or private agency with proven experience and reputation in the assessment of physical/mechanical properties of wood and related composites.

Duties: Identify the physical and mechanical properties of 2 bamboo species including:

1. Moisture content.
2. Volume shrinkage ratio.
3. Fiber saturation point.
4. Specific gravity.
5. Hygroscopicity.
6. Homogeneity.
7. Ignition and combustion.
8. Elasticity – Deformity.
9. Flexibility.
10. Hardness.
11. Bending strength.
12. Compression strength.

- **COMMUNICATION AND PUBLICATIONS**

Legally established company in charge of implementing and covering all costs for the layout and printing of documents for the promotion and dissemination of project activities and rehabilitation, management and sustainable utilisation techniques for tropical forests with bamboo stands. The documents should contain texts, figures/illustrations and photographs. The contents and text (final camera-ready draft) will be provided by the PEU.

The characteristics and layout of the materials produced should be in accordance with the requirements of the project area, whose population is mostly rural.

The manual should include blank pages between chapters for user's notes.

Duties:

1. Design and layout of a brochure.
2. Design and layout of a manual.
3. Printing of documents – brochure (1,000 copies) and rehabilitation and sustainable management manual (1,000 copies).

- **CONSTRUCTION**

Professional with extensive and proven experience in the construction of building works with bamboo as the main material in structural applications and finishes.

Bamboo should be used for structural applications such as struts, beams, roofs and partitions as well as flooring and roofing finishes for easy maintenance.
Built area: approximately 250 m^2.
Restrooms and changing rooms, storeroom for tools and supplies.
Warehouse to store raw materials for processing.

Duties:

1. Coordinate with the PEU regarding the design and plans to be drafted by the specialist subcontracted by PERUBAMBU.
2. Supervise the quality of structural materials (bamboo) to be used.
3. Acquire all flooring, roofing, window, sanitary, electrical and other materials other than bamboo and timber.
4. Supervise building works.
5. Ensure completion of works by the deadline to be agreed with the PEU.

ANNEX 5

SUMMARY OF EXPERT PANEL RECOMMENDATIONS AND MODIFICATIONS FOR PROJECT PD 428/06 (F)

Expert Panel's recommendations	Modifications to PD 428/06 (F)
1. Strengthen the problem tree so as to focus on bamboo forests, as currently it refers to a broader-based scenario.	The problem tree has been revised so as to focus on bamboo forests. Page 12
2. Provide for a more in-depth assessment of the experiences and lessons learnt from ITTO Project PD 2/98 (F,I) and its relevance to this proposal.	The chapter on 'Background' contains a more in-depth analysis of the said project, including design, initial activities, major outputs and experiences and factors that affected project achievements in general. The chapter on 'References' now includes the project report, which describes project outputs and implementation problems. The lessons learned from that project were incorporated in the design of the strategy for this proposal (unrevised). Pages 4 – 6, 13 – 15, 46
3. Clearly justify the need for a utility vehicle, and further reduce the amount allocated to this item so as to be more in line with the current cost of a 4x4 utility vehicle in Peru.	The need for a vehicle has been duly justified taking into account its importance to carry out scheduled activities in the project area, the characteristics of access routes, and cost, which has been reduced by selecting a different brand of vehicle. Annex 6C shows 3 quotes received as of February 2007 for 4x4 trucks that are available in the national market. Pages 2, 35 – 36, 37,39, Annex 6C.
4. Justify or reduce the budget allocated to Budget Item 30. Duty Travel, and further provide a breakdown of these by activities persons responsible and destinations.	Travel costs have been justified in terms of unit costs, number of people and destinations at the national and local levels. The need to strengthen the training for local organisations will require the travel of their representatives to attend coordination meetings, visit and/or participate in fairs, workshops and other related activities. The breakdown of international travel, people and destinations shows a reduction in the average cost of 1 international trip, which was wrongly estimated in the previous document. Pages 2, 34 – 37, 39, Annexes 6A & 6B
5. Include US$15,000 for ex-post evaluation under Item 80 of the ITTO budget by component.	An allocation of US$15,000 has been included in the individual budget tables and in the overall project budget for an ex-post evaluation to be carried out by ITTO after completion of year 3 of project implementation. Pages 35, 37, 39