

# INTERNATIONAL TROPICAL TIMBER ORGANIZATION

## ITTO

### PRE-PROJECT PROPOSAL

TITLE	MANAGEMENT AND UTILIZATION OF PACA ( <i>Guadua sarcocarpa</i> )
SERIAL NUMBER	PPD 4/95 Rev.1 (M)
PERMANENT COMMITTEE	ECONOMIC INFORMATION AND MARKET INTELLIGENCE
SUBMITTED BY	GOVERNMENT OF PERU
ORIGINAL LANGUAGE	SPANISH

#### SPECIFIC OBJECTIVES

The aim of this pre-project is the management and utilization of 1,603,300 ha of Paca (*Guadua sarcocarpa*), which requires the support of technicians with experience in the management and processing of the various bamboo species from ITTO member countries, particularly in the Asian region where Project PD 124/91 Rev.1 (M) was implemented, so as to develop a project aimed at the utilization of this enormous tropical forest resource potential which currently has no definite use.

#### EXECUTING AGENCY

NATIONAL INSTITUTE FOR NATURAL RESOURCES -  
INRENA

#### COOPERATING GOVERNMENTS

#### DURATION

3 MONTHS

#### APPROXIMATE STARTING DATE

JULY 1995

#### BUDGET AND PROPOSED SOURCES OF FINANCE

Source	Contribution in US\$	Local Currency Equivalent
<b>ITTO</b>	<b>40,100.00</b>	<b>89,824.00</b>
Gov't of Peru	14,200.00	31,808.00
Executing Agency		
Other Sources		
<b>TOTAL</b>	<b>54,300.00</b>	<b>121,632.00</b>

**PRE-PROJECT**  
**ON**  
**PACA (*Guadua Sarcocarpa*) MANAGEMENT AND UTILIZATION**

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## **PART I. CONTEXT**

### **A. RELEVANCE TO ITTO**

#### **1. Compliance with ITTO objectives**

This pre-project is consistent with the following objectives of the International Tropical Timber Agreement (ITTA), 1983:

- a. To provide an effective framework for cooperation and consultation between tropical timber producing and consuming members with regard to all relevant aspects of the tropical timber economy.
- c. To promote and support research and development with a view to improving forest management and wood utilization.
- e. To encourage increased and further processing of tropical timber.
- f. To encourage members to support and develop industrial tropical timber reforestation and forest management activities.
- h. To encourage the development of national policies aimed at sustainable utilization and conservation of tropical forests and their genetic resources, and at maintaining the ecological balance in the regions concerned.

#### **2. Compliance with ITTO criteria**

This pre-project proposal is submitted in accordance with the provisions of Article 23 of the International Tropical Timber Agreement (ITTA) and is consistent with the following areas:

- a) Wood utilization, including the utilization of lesser-known and lesser-used species,
- b) Natural forest development, and
- c) Reforestation development.

Furthermore, it is consistent with all the criteria mentioned in the same article and in particular with criterium (e): *They shall make maximum use of existing research institutions and, to the greatest extent possible, avoid duplication of efforts.*

#### **3. Relationship to ITTO action plan and priorities**

This pre-project proposal is consistent with the following basic principle of the Action Plan:

Duplication of work and overlapping should be avoided at project preparation and appraisal stages within the project cycle. Consultations with relevant agencies should also be undertaken to avoid duplication and maximize benefits. These agencies should particularly include institutions from ITTO member countries.

Furthermore, this pre-project is consistent with the following priorities of the Committee on Reforestation and Forest Management related to Special Account activities:

- Studies on the economic and financial costs and benefits of forest management.
- Identification of field demonstration projects where sustainable production of timber and non-timber products may be combined.

In addition, this pre-project fully takes into account the work carried out by the International Tropical Timber Organization in the relevant field.

## **B. RELEVANCE TO NATIONAL POLICIES**

### **1. Relationship to sectoral policies affecting tropical timber**

The pre-project is consistent with the principles stipulated in the following instruments:

#### **Political Constitution of Peru.**

It ratifies the significance of sustainable natural resource utilization.

#### **Constitutional Law of the Ministry of Agriculture.**

It establishes that the aim of the Ministry of Agriculture is to promote the sustained development of the agrarian sector and stipulates its mandate as being the formulation, coordination and evaluation of national policies affecting the agrarian sector with regard to preservation and conservation of natural resources.

The National Institute for Natural Resources (INRENA) was established by virtue of the above law as the agency responsible for the promotion and rational use and conservation of natural resources with the active participation of the private sector. Its objectives are the integrated and rational utilization and management of renewable natural resources and their ecological environment with a view to sustainable development.

The **Forest and Wildlife Law** and its five regulations are the basis of the legislation aimed at ensuring the sustainable use of forest resources and wildlife.

The **Code for the Environment and Natural Resources** reinforces the forest policy guidelines related to the conservation of various types of natural ecosystems and the sustainable management and utilization of natural resources and wildlife as an integral part of the national natural heritage.

### **2. Relationship to subsectoral aims and programs**

The General Forest Directorate is a line agency of INRENA with the main objective of proposing policies, plans and regulations on the sustainable use of forest resources, as well as supervising and monitoring their enforcement. Other objectives are to control and promote the rational use, conservation and preservation of forest resources, as well as to coordinate, supervise and promote the Forestry Action Plan.

The Forestry Action Plan of Peru shares the international concern for global environmental problems and proposes the participation of the country in the solution to these problems based on sustainable utilization and management of forest resources and wildlife.

The Plan has specifically taken into account the political-administrative regionalization process in the country through three "Regional Fora for Forestry Action Priorities", which took place in 1991 with the participation of 241 representatives from regional governments, public bodies, universities, NGO's, producer associations, rural and native communities, and forest-related projects. These fora provided an opportunity to discuss the problems and potential of forest resources, as well as high priority strategies and actions, identifying project proposals.

The policy of the forest sub-sector is aimed at encouraging the sustainable development of forest and related resources as a way of achieving rural development, and provides for the conservation of species. In this respect, this pre-project will seek the support of technicians that have developed techniques for the utilization of similar species so as to incorporate these large areas of no definite use into the national production activity.

### 3. Institutional and legal framework

The National Institute for Natural Resources (INRENA) will be responsible to ITTO for the implementation of this pre-project.

## **PART II. THE PRE-PROJECT**

### 1. ORIGIN

This project proposal derives from the need to utilize 1,603,000 hectares of this species, located to the south of Peru, in the Departments of Madre de Dios and Cuzco.

On the initiative of the private sector, studies have been carried out on the use of this species for pulp and paper manufacturing. However, it has not been accepted due to the high costs involved in its transportation to the processing centres, although it has been shown that Paca pulpwood is more chemically resistant to sulphates than imported pine pulpwood, and it is also suitable for the production of alcohol for motor vehicles.

Today this species has no definite or significant use in the country; it is only used occasionally or sporadically, for instance to make regional meals using *Pacamoto* canes, to make arrow heads, to drink water between the knots of the canes, occasionally for the construction of fences and as an abortive substance in some communities although this use has never been confirmed.

In general, Paca is an undesirable species for the populations settled in the area where it occurs because of its sharp and hard thorns and because when it is cut, the canes are left with very sharp cutting edges which make them unsuitable for cattle fodder. Thus, it is usually burnt to clear the land for agricultural purposes.

Given its similarity with bamboo, we think Paca can be harvested for other uses as is the case with bamboo in Asia, specifically in China, where the Chinese Academy of Forestry has developed very interesting techniques to use bamboo in different production lines, as shown in Project PD 124/91 Rev.1 (M): "Study on the substitution of bamboo for tropical timber as raw materials in China", implemented with ITTO funding in November 1993.

The areas of Paca distribution are potentially suitable for coca crops; therefore, alternative activities must be promoted for the economic benefit of the communities settled in the area, and also to curb mass migration from the highlands.

In order to avoid duplication of efforts and maximize benefits, we have decided to request ITTO support so that a technician who has developed these techniques in other member countries can

analyze the feasibility of using this species as a possible alternative to increase the income levels of the local communities and interest them in the management of the species rather than its destruction, for the benefit of the country through the production of end-products.

## 2. PRE-PROJECT OBJECTIVES

### 2.1 Development objective

- To outline policies and strategies for the conservation and sustainable utilization of species so as to maintain the existing natural biodiversity in the natural forests of Peru.

### 2.2 Specific objective

- To formulate a project with the participation of a technician from an ITTO member country where techniques have been developed for the use of similar species such as bamboo in order to define and promote the utilization of Paca (*Guadua sarcocarpa*).

## 3. PROJECT JUSTIFICATION

### 3.1 Problem to be addressed

The rational and sustainable utilisation of forest resources, especially resources from moist tropical forests, is an increasingly relevant topic. On the one hand, and through the process of legislation, countries are taking stock of the importance of adequately utilising and managing their forest resources in order to ensure the basic principles of conservation. On the other hand, the needs of the population increase the pressure on natural resources every year as they strive to satisfy these needs.

However, the problem is even greater in moist tropical forests, where the great diversity of species per unit area and their accessibility make this task extremely difficult.

Only 20 out of the approximately 2,500 existing species are in fact utilised. On the other hand, there are species that have a more homogeneous distribution, but have a low commercial value and are therefore not harvested at an industrial scale.

There are also other species in the Amazon region that have a homogenous distribution, such as the palm tree and bamboo species, but these are not adequately utilised.

The pressure to use the resources from tropical forests is always increasing. Therefore, in order to curb the escalating deforestation rate (approximately 300,000 ha each year), it will be necessary to promote the use of new species so as to satisfy the needs of the population, both at the local and national levels, in terms of end-products.

One of these resources is Paca (*Guadua sarcocarpa*), which is used to a certain extent by some native communities in Peru, but has not become socio-economically important to date.

Today, despite the fact that it is widely distributed throughout the Amazon region, this species is not being adequately used in line with its potential. Peru currently has 1,630,300 hectares of Paca (*Guadua sarcocarpa*), in the south west of the country and despite having this very significant volume and distribution range, the species is not being used to any important extent; in fact, the species is being eliminated through slash and burn operations to expand agricultural activities, as it is considered to be an undesirable species without taking into account the importance of the ecosystem that is being progressively lost.

### 3.2 Characteristics of region or areas where project will be located

As previously mentioned, the Amazon region is characterised by the heterogeneous nature of the natural vegetation. The basin areas of the Urubamba and Tambo rivers, both tributaries of the Ucayali river, are found in the south western sector of this vast region, in the department of Ucayali, and the basin areas of the Manu and Madre de Dios rivers are in the department of Madre de Dios. These areas have extensive volumes of Paca, which is found in small clearings where they dominate or form the understorey in association with chorisia, brosimum, coumaruma and matisia, among others.

The project area is divided into two distinct landscapes, i.e. the alluvial area, that originated from accumulations of river-borne sediments over the years, and the hilly district, made up of low and medium-height hills with various degrees of dissection caused by rainfall.

Two life zones have been identified in this area: Moist Tropical Forest (MTF) (with two associations, i.e. fertile soils in the alluvial landscape and low fertile soils in the hilly landscape) and very moist transitional pre-montane tropical forest (vmf - tpt).

The lands suitable for agriculture are found in the alluvial plains, which have the best soil, topographic and ecological conditions in the area, with deep neutral to slightly alkaline soils with medium to low natural fertility. The forestry apt lands are found in the hilly area with strong to very steep gradients and soils with low to medium natural fertility.

There are about 50,000 people living in the region including native communities and settlers, whose main activities are agriculture and forestry. There is no skilled labour for the industry, but the available local manpower is highly skilled in forest logging operations and rural work in general.

The project will primarily be developed in the Inka and Ucayali regions.

### 3.3 Other relevant aspects of situation prior to pre-project

At present, in view of the fact that Paca does not have a specific use and is considered to be an undesirable species, it is under great pressure from farmers who eliminate it during their slash and burn practices. In view of this, unless measures are taken at the national level to make this species economically interesting for the farmers and their families, the distribution of this species would be seriously affected by the attempts to eliminate it through burning practices in order to clear the land for other activities, such as illegal coca crops.

### 3.4 Intended situation after pre-project completion

The implementation of this pre-project will lead to the development of a project which is expected to achieve the following:

1. To contribute to the rational utilisation of forest resources of moist tropical forests, particularly species of the Bambusa genus.
2. To rationally utilise a species that is widely distributed throughout the region, but which is currently of no commercial importance.
3. To generate income and employment (value added) for the native communities of the region.



4. To diversify the supply of non-timber forest products.
5. To create a competitive market for processed products from a species of the bamboo family, both at the national and international levels.
6. To respond to market demands and international standards with regard to the marketing of timber products from moist tropical forests.
7. To initiate a research program on the only bambusa species in Peru, which has been recently discovered by scientists.
8. To acquire knowledge on processing techniques from countries that use similar species.
9. To promote the technical use of a forest species that is currently not being used for any specific purpose.

After the completion of this pre-project, a document will be available which will outline a series of management and utilisation techniques for the Paca species, and which can be used by the communities in the project area as an alternative to burning off this species.

### 3.5 Target beneficiaries

The target beneficiaries of the project will be the approximately 50,000 settlers living in the areas of Paca (Guadua sarcocarpa) occurrence, including both native communities and settlers.

### 3.6 Project strategy

#### 3.6.1 Reasons for selection

No research has been carried out in the country on Paca species, with the exception of a study carried out by a private company on the feasibility of using this species as raw material for pulp and paper manufacturing, and although the results of the study revealed that Paca pulpwood is more chemically resistant to sulphates than imported pine pulpwood and that it is also suitable for the production of alcohol for motorized vehicles, the species was not found to be economically viable due to the high transport costs involved. For this reason, no techniques have been developed in the country for the processing and use of Paca. However, some Asian countries are known to fully utilize bamboo, and since Paca is very similar to bamboo, the activities carried out by the Chinese Academy of Forestry, for example, may prove to be very useful if they could be applied to Paca.

#### 3.6.2 Lessons drawn from past evaluation

This pre-project has been developed because despite the enormous resource potential available in the country, the local communities do not utilize this species as they consider it to be undesirable and burn it in an attempt to eliminate it. If no attention is given to this species and no remedial measures are taken, it could become endangered in the future.

Taking into account the experiences of other countries with similar species, we consider it appropriate to seek their assistance so that after analyzing its technical feasibility, a project can be implemented to promote and disseminate these techniques which are still unknown in our country.

### 3.6.3 Technical and scientific aspects

The *Guadua sarcocarpa* species, known by the common name of Paca, is a newly identified species with two sub-species commonly found in the Peruvian, Brazilian and Bolivian Amazons. This is the first species of the *Guadua* genus found to have fleshy fruit and the first bamboo in the New World that is reported to be edible. This new species shares ten morphological features with the closest *Guadua weberbaueri* species. In Peru, this species has never been studied or tested on a large scale, and it has always been used on a non-industrial basis without any economic significance.

Another species of the same *Guadua* genus is found in small areas in Peru, mostly in the Department of San Martin (area under the influence of coca trafficking). This species, commonly known as *angustifolia*, is being promoted in Colombia in order to ensure its protection. It is found to be resistant, light-weight, a good water and soil protector particularly on slopes, and its stem is used in one piece, split for the manufacturing of mats, interwoven or in planks as a building component.

Today in Colombia there are approximately 50,000 ha of *Guadua angustifolia*, and it is estimated that some five centuries ago there were over 12 million hectares. This could be an indication of the future fate of Paca if no practical use is found for this species, which is still widely distributed throughout Peru.

According to the information received from the local populations, the cycle of this species is 25-30 years, which would facilitate its sustained yield management. The species has also been found to be flood intolerant. There is still a lot to be learned about this species, and therefore silvicultural studies are essential to obtain information about its behaviour and performance.

The approach taken in this pre-project is essentially based on the fact that other countries have developed techniques for the management and utilization of similar species such as bamboo, which is used for plybamboo, parquetry, particle boards and fine crafts, among other uses. To this end, and in order to avoid duplication of efforts, we should take advantage of this expertise by seeking cooperation from countries that have the same target of sustainable tropical forest management.

In addition, Paca utilization and management could represent an economic alternative to halt the growing of coca in this area, which seems to be so suitable for these crops.

### 3.6.4 Economic aspects

Because of the conceptual basis of this project, it will give an opportunity for the communities settled in the area within the Paca distribution range to be interested in the management and utilization of this species as a possible alternative for the generation of additional income.

### 3.6.5 Environmental aspects

Given the nature of this project, there is no risk of causing any adverse impacts on the environment. It will be a basic tool to protect this species, minimizing the factors that make it undesirable.

### 3.6.6 Social aspects

As stated above, the communities settled in these areas consider Paca to be an undesirable species. Thus, it is necessary to revert this attitude to avoid the burning of these areas for agricultural purposes. To this end, an alternative use must be found for this species so as to interest the communities in their management as a source of income.

If additional income can be generated through the utilization of this species, the communities will be interested in its conservation and management, which would be in consonance with their forest use expectations.

### 3.6.7 Managerial aspects

INRENA will be the pre-project implementing agency. The Institute has extensive experience in the management of natural tropical forest resources in the country.

## 3.7 REASONS FOR ITTO SUPPORT

### 3.7.1 ITTO aspects

As mentioned in Part I, this project is consistent with ITTO policies and shares the objectives of the Organization and the core priorities of the ITTO Action Plan. Furthermore, ITTO is the ad hoc organization to provide assistance in view of the fact that one of its members has developed techniques for the management and use of a similar species.

### 3.7.2 Relationship to relevant actions supported by other donors

There are no other known potential donors to finance the implementation of this pre-project.

## 3.8 RISKS

There are no risks that could hinder the implementation of this pre-project, as it is required for the development of a full project which should be implemented as soon as possible and would be of national interest.

## 4.0 OUTPUTS

### Specific objective:

To formulate a project with the participation of a technician from an ITTO member country where techniques have been developed for the use of similar species such as bamboo in order to define and promote the utilization of Paca (*Guadua sarcocarpa*).

### **Output:**

A project document including identification and recommendation of the most suitable management and processing techniques that can be applied to Paca (*Guadua sarcocarpa*).

## 5.0 ACTIVITIES AND INPUTS

### **Output:**

A project document including identification and recommendation of the most suitable management and processing techniques that can be applied to Paca (*Guadua sarcocarpa*).

### **Activities:**

- Initial coordination arrangements.
- Hiring of 01 international consultant specialized in the processing of *Guadua* spp. or similar species of the Poaceae family such as bamboo.
- Hiring of a translator.
- Organization of work team with national staff.
- Hiring of botanical identification services and physical-mechanical resistance tests.
- Visit of consultant and INRENA personnel to the areas of Paca (*Guadua sarcocarpa*) distribution.
- Development of Project Document.

### **Inputs:**

- 01 international consultant (2 man/months).
- Services of a translator (English-Spanish).
- Botanical identification services and physical-mechanical resistance tests.
- Communication services.
- Office space.
- Qualified national personnel.
- Travel - tickets and DSA.
- Transport services.
- Computing services.
- Office materials.
- Publishing services.

## **6.0 LOGICAL FRAMEWORK WORKSHEETS**

The Pre-project Logical Framework is shown in Annex 1.

## **7.0 WORK PLAN**

Annex 2 shows the work plan to be used to implement the pre-project, including a schedule of activities and parties responsible for their implementation.

## **8.0 INSTITUTIONAL ARRANGEMENTS FOR EXECUTION AND OPERATION**

### **8.1 Management structure**

The pre-project will be the responsibility of INRENA, which will also be the pre-project implementing agency. Annex 3 shows INRENA's organizational chart.

## 8.2 Future operation and maintenance

The equipment and other infrastructure acquired for the implementation of the full project, as proposed by this pre-project, will be the responsibility of INRENA, that will be in charge of the implementation of activities and functions upon project completion and will be responsible for its follow-up.

## 8.3 Key staff

Project key staff will be as follows:

### **01 International consultant specialized in the management and processing of Guadua spp. or similar species of the Poaceae family such as bamboo.**

- Forest Engineer with a Masters' Degree, specialized in the management and processing of Guadua spp. or similar species of the Poaceae family such as bamboo.
- Ten (10) years experience in the field.
- Monthly salary: US\$8,000.00
- Duration: 2 months

#### Duties

- To identify the most suitable processing techniques taking into account basic principles of economic and ecological efficiency, both at the non-industrial and industrial levels, so that Paca production can become an alternative source of income for the communities settled in the area and avoid the destruction of Paca as an undesirable species.
- To develop general guidelines for a Paca management plan, based on the recommended use and processing of this species, including economic and ecological efficiency criteria. Potential Paca uses should be outlined in a specific separate chapter.
- This expert will be responsible for the drafting of the final project document in accordance with ITTO format for project submission.

## 9.0 PRIOR OBLIGATIONS AND PRE-REQUISITES

Before pre-project start-up, coordination arrangements will be made with centres responsible for the management and utilization of similar species in those countries known to have developed successful techniques in this field, as well as arrangements to ensure the provision of facilities required by the consultants to perform their duties.

## 10. POSSIBLE FUTURE ACTIONS

Upon pre-project completion, a project document will have been developed in accordance with ITTO guidelines for project formulation, so as to provide for project funding and implementation with a view to supporting reforestation and forest management activities in relation to tropical timber species with great utilization potential.

### **PART III. MONITORING, REPORTING AND EVALUATION**

1. Arrangements for reporting

A final project document will be submitted on **MANAGEMENT AND UTILIZATION OF PACA (*Guadua Sarcocarpa*)**. A Pre-project Completion Report will also be prepared according to ITTO formats.

2. Monitoring and Evaluation

This pre-project will be evaluated on an ongoing basis by the staff of INRENA's General Forest Directorate.

### **PART IV. BUDGET**

The attached tables show a general breakdown of estimated costs for the three-month pre-project implementation period.

**PROJECT BUDGET - NATIONAL CONTRIBUTION (US\$)**

<b>CODE</b>	<b>BUDGET ITEM</b>	
10	PROJECT PERSONNEL	
2	02 National experts 3 man/months	6000
12	Administrative personnel 2 man/months	1200
17	Assistant technical personnel 2 man/months	1000
19	Component Total	8200
40	CAPITAL ITEMS	
41	Premises	2000
43	Capital equipment	4000
49	Component Total	6000
99	GRAND TOTAL	14200

**PROJECT BUDGET - ITTO CONTRIBUTION (US\$)**

<b>CODE</b>	<b>BUDGET ITEM</b>	
10	PROJECT PERSONNEL	
11	National Expert 3 man/months	3000
13	01 International consultant 2 man/months	16000
14	Other labour	5000
19	Component Total	24000
20	SUB-CONTRACTS	
21	Publications	500
23	Others	500
29	Component Total	1000
30	DUTY TRAVEL	
31	Daily Subsistence allowance	3000
32	Transport Costs	6000
39	Component Total	9000
50	CONSUMABLE ITEMS	
54	Office supplies	1000
55	Communications	2000
59	Component Total	3000
60	MISCELLANEOUS	
61	Sundry	1000
69	Component Total	1000
70	ITTO MONITORING, EVALUATION AND ADMINISTRATION	
72	Administrative costs	2100
79	Component Total	2100
99	GRAND TOTAL	40100



**CONSOLIDATED PRE-PROJECT BUDGET**

CODE	BUDGET ITEM	COST (US\$)
10 19	PROJECT PERSONNEL Component Total	32200
20 29	SUB-CONTRACTS Component Total	1000
30 39	DUTY TRAVEL Component Total	9000
40 49	CAPITAL ITEMS Component Total	6000
50 59	CONSUMABLE ITEMS Component Total	3000
60 69	MISCELLANEOUS Component Total	1000
70 79	ITTO MONITORING, EVALUATION and ADMINISTRATION Component Total	2100
99	GRAND TOTAL	54300

### TOTAL PRE-PROJECT BUDGET BREAKDOWN BY ACTIVITY

OUTPUTS/ACTIVITIES	BUDGET COMPONENTS							
	PROJECT PERSONNEL	SUB-CONTRACTS	DUTY TRAVEL	CAPITAL ITEMS	CONSUMABLE ITEMS	MISCELLANEA	MONIT. & EVAL.	GRAND TOTAL
A project document including identification and recommendation of the most suitable management and processing techniques that can be applied to Paca ( <i>Guadua sarcocarpa</i> ).								
<b>ACTIVITIES</b>								
1. Initial coordination arrangements.	2,000			1,200	300	100	500	4,100
2. Hiring of 01 international consultant specialized in the processing of <i>Guadua</i> spp. or similar species of the Poaceae family such as bamboo.	2,000			300	500	100		2,900
3. Hiring of one translator.	2,000			300	500	100		2,900
4. Organization of work team with national staff.	3,000			300	100	100		3,500
5. Hiring of botanical identification services and physical-mechanical resistance tests.	2,000			300	100	100		2,500
6. Visit of consultant and INRENA personnel to the areas of Paca ( <i>Guadua sarcocarpa</i> ) distribution.	1,200		9,000	300	500	100		11,100
7. Development of Project Document.	20,000	1,000		3,300	1,000	400	1,600	27,300
<b>GRAND TOTAL</b>	<b>32,200</b>	<b>1,000</b>	<b>9,000</b>	<b>6,000</b>	<b>3,000</b>	<b>1,000</b>	<b>2,100</b>	<b>54,300</b>

**ANNEXES**

ANNEX 1

LOGICAL FRAMEWORK MATRIX

PROJECT ELEMENTS	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p><b>Development objective:</b> To outline policies and strategies for the conservation and sustainable utilization of species so as to maintain the existing natural biodiversity in the natural forests of Peru.</p>	<p>INRENA actions and legal standards aimed at promoting the sustainable use of natural resources</p>	<p>Supreme Decrees, Ministerial Resolutions, forest promotion activities and proposal for new Forestry Law.</p>	
<p><b>Specific objective:</b> To formulate a project with the participation of a technician from an ITTO member country where techniques have been developed for the use of similar species such as bamboo in order to define and promote the utilization of Paca (<i>Guadua sarcocarpa</i>).</p>	<p>O1 Project document: "Management and Utilization of Paca (<i>Guadua sarcocarpa</i>)"</p>	<p>Staff contracts concluded</p>	<p>Need to have a project document leading to the implementation of a project aimed at the sustainable utilization of a widely distributed and high volume species that is considered undesirable by the local communities.</p>
<p><b>Outputs:</b> A project document including identification and recommendation of the most suitable management and processing techniques that can be applied to Paca (<i>Guadua sarcocarpa</i>).</p>	<p>O1 project document including recommendations for a management plan and most suitable techniques for Paca utilization based on economic and ecological efficiency criteria.</p>	<p>Reports on field trips</p>	<p>Having a document offering viable alternatives for the management and use of Paca so as to change the attitude of the communities who consider it undesirable and thus avoid the burning of this species for agricultural purposes.</p>

PROJECT ELEMENTS	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p><b>Activities:</b></p> <ul style="list-style-type: none"> <li>● Initial coordination arrangements.</li> <li>● Hiring of 01 international consultant specialized in the processing of <i>Guadua</i> spp. or similar species of the Poaceae family such as bamboo.</li> <li>● Hiring of a translator.</li> <li>● Organization of work team with national staff.</li> <li>● Hiring of botanical identification services and physical-mechanical resistance tests.</li> <li>● Visit of consultant and INRENA personnel to the areas of distribution of Paca (<i>Guadua sarcocarpa</i>).</li> <li>● Development of Project Document.</li> </ul>	<p>Communication services Office space</p> <p>Communication services Tickets and DSA</p> <p>Translation services contract.</p> <p>Qualified national personnel</p> <p>Technical report</p> <p>Tickets and DSA Transport services</p> <p>Computing services Office materials Publishing services</p>		

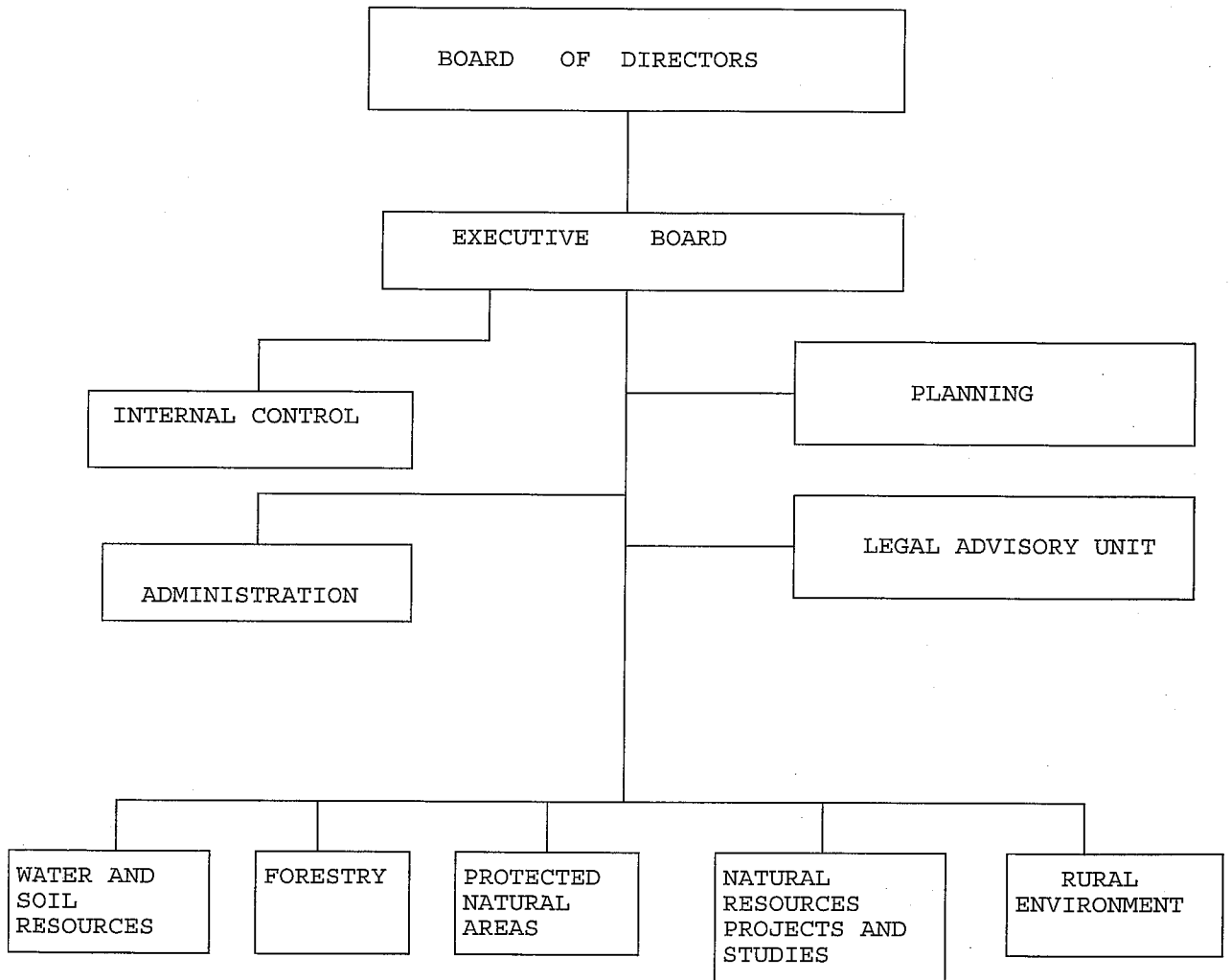
## ANNEX 2

## WORK PLAN

OUTPUTS AND ACTIVITIES	RESPONSIBLE PARTY	SCHEDULE (in months)		
		1st month	2nd month	3rd month
<p><b>Output:</b></p> <p>A project document including identification and recommendation of the most suitable management and processing techniques that can be applied to Paca (<i>Guadua sarcocarpa</i>).</p>				
<p><b>Activity 1:</b></p> <p>Initial coordination arrangements</p>	INRENA	X		
<p><b>Activity 2:</b></p> <p>Hiring of 01 international consultant specialized in the processing of <i>Guadua</i> spp. or similar species of the Poaceae family such as bamboo.</p>	INRENA	X		
<p><b>Activity 3:</b></p> <p>Hiring of a translator</p>	INRENA	X		
<p><b>Activity 4:</b></p> <p>Organization of work team with national staff.</p>	INRENA	X		
<p><b>Activity 5:</b></p> <p>Hiring of botanical identification services and physical-mechanical resistance tests.</p>	INRENA		X	
<p><b>Activity 6:</b></p> <p>Visit of consultant and INRENA personnel to the areas of distribution of Paca (<i>Guadua sarcocarpa</i>).</p>	INRENA		X	
<p><b>Activity 7:</b></p> <p>Development of Project Document.</p>	INRENA			X

ANNEX 3

NATIONAL INSTITUTE FOR NATURAL RESOURCES (INRENA) - ORGANIZATIONAL CHART



Botanical description of *Guadua Sarcocarpa*

## SYSTEMATIC BOTANY

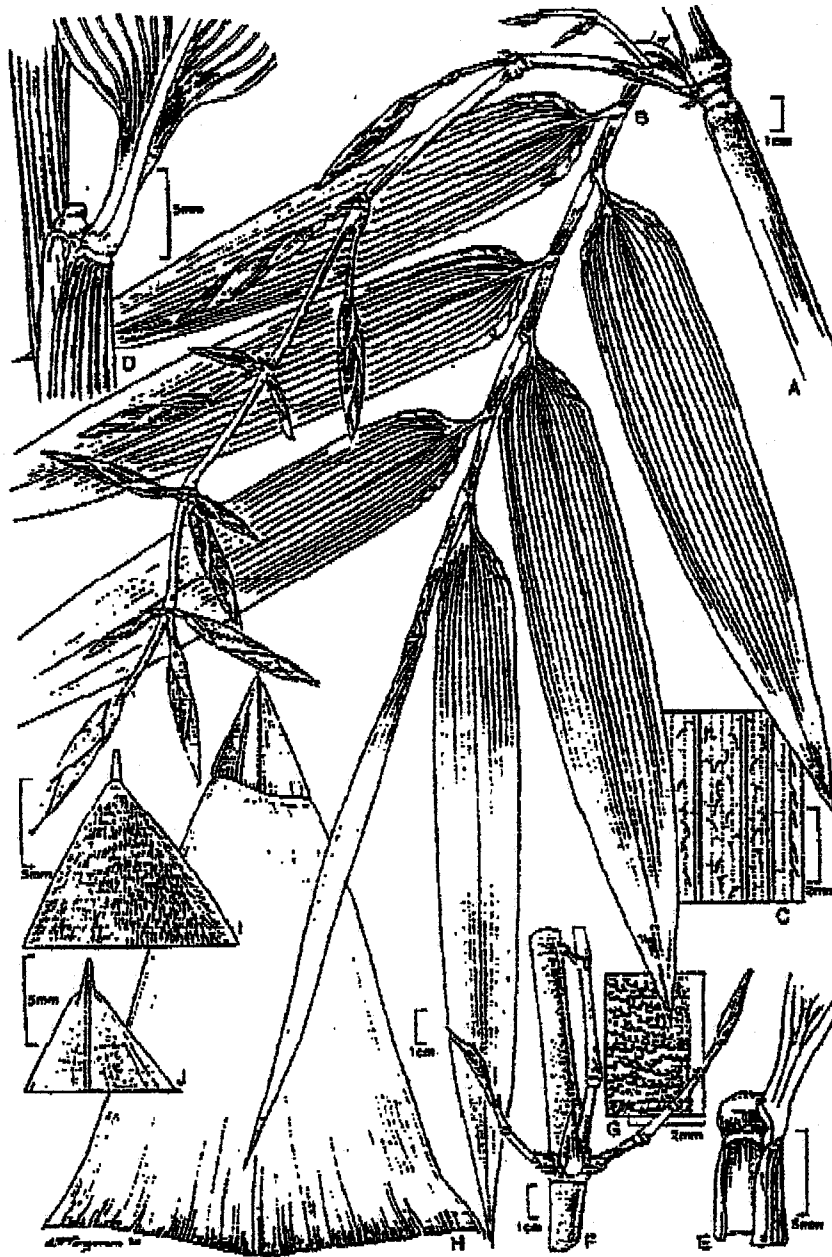


FIG. 1. *Guadua sarcocarpa*. A. Flowering branch. B. Foliage leaf complement. C. Detail of the abaxial leaf surface. D. Foliage leaf ligular area, abaxial view. E. Inner ligule of the foliage leaf, adaxial view. F. Branch complement. G. Detail of culm surface. H. Culm leaf. I. Adaxial apex of the culm leaf blade showing appressed pubescence. J. Abaxial apex of the culm leaf blade showing a distinct midnerve and a mucronate apex. Based on Radley *et al.*



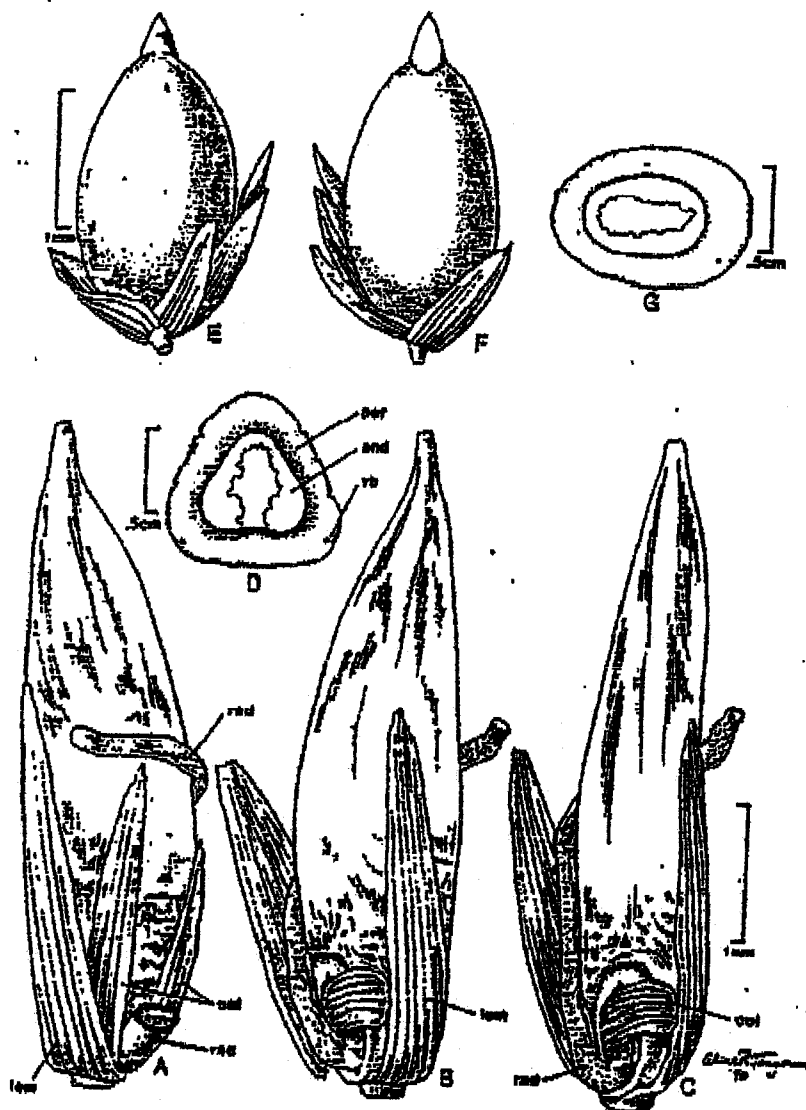


FIG. 3. Fruits of *Gossypium serotense*. A-D. *G. serotense* subsp. *serotense*. A. Lateral view of fruit showing lemma (lem), palea (pal), rachilla (rach), and radicle (rad). B. Lateral view of fruit, showing basal and lateral position of a well-developed embryo bursting through the lemma (leg). C. Ventral view of the fruit showing the coleoptile (col) and radicle (rad) emerging from the embryo. D. Cross section of the fruit showing fleshy pericarp (per), gelatinous or liquid endosperm (end) and vascular bundles (vb). E-G. *G. serotense* subsp. *javanicum*. E. Lateral view of the fruit, with the rachilla and the upper part of the pseudospikelet attached to the base. F. Ventral view of fruit showing the abruptly apiculate apex, and the legume attached to the base. G. Cross section of the fruit. Based on: A-D: Redeyi s.n., and E-G: Watschman & Enckeviczin 789.