INTERNATIONAL TROPICAL TIMBER ORGANIZATION

ITTO

PROJECT PROPOSAL

TITLE	MANAGEMENT AND UTILIZATION OF PACA (*Guadua sarcocarpa*)
SERIAL NUMBER	PD 2/98 (F,I)
COMMITTEE	REFORESTATION AND FOREST MANAGEMENT
SUBMITTED BY	GOVERNMENT OF PERU
ORIGINAL LANGUAGE	SPANISH

OBJECTIVES

To develop knowledge and technology for the management and use of Paca so as to improve the living standards of the rural population and ensure the conservation and preservation of moist tropical forest ecosystems and biodiversity in Peru.

EXECUTING AGENCY	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	**833,355**
	Gov't of Peru	361,480
	TOTAL	**1,194,835**

MANAGEMENT AND UTILIZATION OF PACA (*Guadua sarcocarpa*)

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PART I. CONTEXT

A. Relevance to ITTO

1. Compliance with ITTO objectives

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

a) To provide an effective framework for consultation, international cooperation and policy development among all members with regard to all relevant aspects of the world timber economy;

c) To contribute to the process of sustainable development;

d) To enhance the capacity of members to implement a strategy for achieving exports of tropical timber and timber products from sustainably managed sources by the year 2000;

f) To promote and support research and development with a view to improving forest management and efficiency of wood utilization as well as increasing the capacity to conserve and enhance other forest values in timber producing tropical forests;

g) To develop and contribute towards mechanisms for the provision of new and additional financial resources and expertise needed to enhance the capacity of producing members to attain the objectives of this Agreement;

i) To promote increased and further processing of tropical timber from sustainable sources in producing member countries with a view to promoting their industrialization and thereby increasing their employment opportunities and export earnings;

j) To encourage members to support and develop industrial tropical timber reforestation and forest management activities as well as rehabilitation of degraded forest land, with due regard for the interests of local communities dependent on forest resources;

l) To encourage members to develop national policies aimed at sustainable utilization and conservation of timber producing forests and their genetic resources and at maintaining the ecological balance in the regions concerned, in the context of tropical timber trade;

m) To promote the access to, and transfer of, technologies and technical cooperation to implement the objectives of this Agreement, including on concessional and preferential terms and conditions, as mutually agreed.

2. Compliance with ITTO criteria

This project proposal is consistent with the criteria established in Article 23 of the International Tropical Timber Agreement (ITTA, 1983), items a), b), c), d) and e), which stipulate that projects should comply with the following:

a) They should be related to the production and utilization of industrial tropical timber;

b) They should yield benefits to the tropical timber economy as a whole and be relevant to producing as well as consuming members;

c) They should be related to the maintenance and expansion of the international tropical timber trade;

d) They should offer reasonable prospects for positive economic returns in relation to costs; and

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 Project is consistent with the priorities established by the Committee on Reforestation and Forest Management, in particular the following:

- 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.
- Comparative assessment of silvicultural treatments on permanent sample plots.
- Study of the effect of different intensities of timber harvesting on forest sustainability.
- Promoting and financing demonstration projects for different management models, and regional/sub-regional networks of such projects.

The Project is also consistent with the priorities established by the Committee on Forest Industry, particularly the following:

- Projects in selected strategic locations to promote the integrated development of sustainable forest management and industrial use.
- Support for industrial trials, pilot production and marketing of new species.
- Help for the development of industrial infrastructure, research and appropriate standards.
- Delivery of trial volumes of new species and products, and other approaches to facilitate acceptance in selected foreign markets.

B. RELEVANCE TO NATIONAL POLICIES

1. Relationship to sectoral policies affecting tropical timber

This Project is consistent with the principles stipulated in the following legal 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.

Forest and Wildlife Law.

This law and its five regulations are the basis of the legislation aimed at ensuring the sustainable use of forest resources and wildlife.

Code for the Environment and Natural Resources.

This Code 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 Project is framed within the aims and plans of the General Forest Directorate, 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 promote the rational use, conservation and preservation of forest resources, as well as to coordinate, supervise and promote the Forestry Action Plan.

3. Institutional and legal framework

The National Institute for Natural Resources (INRENA) will be responsible to ITTO for the technical and administrative implementation of this Project. INRENA will appoint a Project Director and will establish the policies and strategies to be followed by the Project.

PART II. THE PROJECT

1. ORIGIN

This project proposal derives from the need to develop technologies within the forest subsector for the management and utilization of Paca so as to ensure the preservation of this species, forest ecosystems and biodiversity in the shouthern region of the country, where Paca covers over 4,000,000 hectares which are being subject to destructive practices by the rural communities, who burn Paca forests to obtain lands for shifting agriculture.

The practices of the rural communities, who consider Paca to be an undesirable resource, are the result of their low income levels and the lack of alternatives for employment and additional income.

If this situation is not reverted in the short or medium term, existing Paca forests will eventually disappear resulting in degraded lands and extinct resources, with the corresponding serious implications for both the area where Paca is a valuable resource which adequately managed and utilized could improve the standard of living of the rural population, and also for the country and tropical forests in general.

This project proposal is based on the recommendations derived from Pre-project **PPD 4/95 Rev.1 (M): "Management and Utilization of Paca (*Guadua sarcocarpa*)"**, financed by ITTO and implemented by INRENA during the first semester of 1996.

As part of the Pre-project activities, two Peruvian foresters and an international consultant gathered and analyzed the scarce information available on this species both in Peru and in other Amazon countries.

This technical team carried out a field reconnaissance survey over the Paca forests in the Iberia-Iñapari Region, Department of Madre de Dios; interviewed local community members, technicians and authorities; carried out a preliminary assessment of the use potential of Paca; and concluded that the culms of this species are a raw material similar to bamboo, which can be used for many products as is currently done in many parts of the world. Experts from various local institutions and farmers also saw great potential in the Paca shoots. However, the sustainable harvesting of this resource requires the scientific management of Paca stands.

Based on their studies, the experts recommended the follow-up and further diversification of Pre-project activities, taking into account that the information and knowledge available on Paca are limited and that the communities are not aware of the appropriate technologies for its management and utilization. Furthermore, it was recommended that all activities to be carried out in the following phase be implemented on an experimental scale.

Thus, this Project is focused on the establishment of a pilot Paca area over 2,000 hectares of Paca stands located nine kilometers to the south-east of Iñapari, in the province of Puerto Maldonado, Department of Madre de Dios, so as to generate information on Paca and its uses, develop technologies and techniques for Paca management and utilization, and finally disseminate and implement these experiences for the benefit of the communities and for the conservation of resources.

2. PROJECT OBJECTIVES

2.1 Development objective

To develop knowledge and technologies on Paca management and utilization so as to improve the standard of living of the rural population and to ensure the conservation and preservation of moist tropical forest ecosystems and biodiversity in Peru.

2.2 Specific objectives

To manage and utilize Paca with the two-fold aim of generating work and income for the Iñapari population and to ensure the conservation of this resource.

3. PROJECT JUSTIFICATION

3.1 Problem to be addressed

The Paca species is not currently being commercially cultivated or utilized in Peru. In some native communities the stem of Paca is used to make arrow heads for personal use and to prepare abortion-inducing brews; Paca seeds and shoots are also a source of food for the indigenous populations.

In general terms, farmers consider Paca to be an undesirable species due to its invasive nature, and to the fact that the thorns in the plant make its harvesting difficult and that manual processing is required to obtain the different Paca products.

As a result, local farming communities burn Paca forests to convert the areas into agricultural and pasture lands. Two or three years down the line, when the soils have been degraded by erosion and nutrient depletion as a result of the environmental conditions prevailing in these areas, these communities abandon these lands and carry out slash-and-burn operations in other Paca natural forest areas, successively repeating the same process over similar periods of time. By doing this, they destroy the forest and wildlife habitats, deplete the number of individuals of endemic species and endanger the survival of the Paca species.

From a long-term perspective, the current attitude of the local communities vis-a-vis Paca will have serious negative repercussions such as soil erosion, destruction of the tropical forest ecosystem which could lead to desertification, and a general detrimental effect on the stability and sustainability of the natural environment.

Paca is taxonomically classified as ***Guadua sarcocarpa***, a species with two sub-species that belong to the ***Guadua*** genus of Bambusoideae. The biological behaviour and physical properties of Paca are similar to those of other bamboo species that are extensively grown and widely used in other parts of the world, especially in Asian countries where the bamboo industry generates substantial benefits. Therefore, and in view of destructive practices applied to Paca forests in the south-east region of the country, it is essential to take decisive measures in order to change these practices and ensure the conservation of the Paca species and related ecosystems. In this context, it is appropriate to remember that bamboo processing techniques already exist which are relatively simple and require relatively cheap equipment, and, therefore, it would not be difficult to process the Paca species in Peru.

3.2 Characteristics of the region

The most important area of distribution of the Paca species is situated in the south-east of the country, at altitudes that range from 340 meters above sea level to approximately 2,000 meters above sea level, and it covers an area of more than 4 million hectares, 1.6 million of which are pure Paca forests.

The local communities of the area practice subsistence farming and cattle-raising activities; they are normally underemployed and do not have sufficient incomes to satisfy their basic needs.

The area where the Project will be implemented is situated in Iñapari, province of Puerto Maldonado, Madre de Dios Department, Inca Region, an area which is on the border with Brazil.

The climate in this area is moist and hot; the mean annual temperature is 25°C, and the maximum and minimum monthly temperatures are 35.2°C and 12.2°C respectively. The annual rainfall ranges from 1641 mm to 1837 mm and is concentrated throughout a period of five months of the year (from November to March). The soils are alluvial with a pH of between 4.8 to 6.2, the soil fertility is poor to medium, and the soils have a fine texture and good drainage.

These conditions are favourable for the growth of Paca and forests in general, but they are not suitable for agriculture and cattle raising activities, or for any other activities that require the elimination of the natural vegetation cover.

In the areas of distribution of Paca, the natural conditions are also favourable for the cultivation of coca plants, an activity which is banned in the country if the production is used for illegal purposes. In order to prevent the expansion of coca plantations in the area, Paca represents a good alternative crop.

3.3 Other relevant aspects of pre-project situation

Clandestine coca plantations have been proliferating in the area at the expense of Paca forests, due to the repression of this illegal crop in other parts of the country.

Due to the fact that the wet season lasts for five months and that there are no other economic activities apart from subsistence agriculture, many of the local inhabitants of this region are either unemployed or under-employed. The establishment of local industries that would generate a substantial number of jobs would be a solution to this problem. This project will ensure that after receiving appropriate training and once the transfer of technology on the management and utilization of Paca is accomplished, the local communities will adopt a viable model based on the sustainable utilization of this resource in order to improve their standard of living.

Currently, the Iñapari Municipal Council is establishing experimental plantations using Paca and other bamboo species to protect the banks of the Acre River.

3.4 Intended situation after project completion

After project completion there will be sufficient information available on Paca management and utilization in the Iñapari region in order to facilitate the management of the 4 million hectares of Paca forests that are found in the south-eastern region of Peru.

The Paca products to be produced and the traditional and potential markets for this production will have been identified.

The feasibility of Paca management and utilization will have been demonstrated, thus ensuring the conservation of the species, the ecosystems and the biodiversity of the tropical forests in this region.

The local communities will have a viable alternative to increase their employment and economy and, therefore, will modify their current attitude vis-a-vis Paca forests.

The country will have acquired experiences that will facilitate the implementation of management plans and the use of Paca in other regions as well as implementing development strategies based on the sustainable utilization of tropical forest resources.

3.5 Beneficiaries

The direct beneficiaries of the project will be the local communities who will learn to manage and utilize the Paca species. This in turn will create the appropriate conditions for transferring proven technologies throughout the south-eastern region of the country by means of a multiplier effect.

Processing technologies for Paca products will be highly labour intensive, thus creating the possibility of generating a substantial number of jobs.

Finally, the sectors of the Peruvian population that are currently using imported bamboo products will also benefit from the project as they will have an alternative local source of raw materials of similar quality at a lower price. Furthermore, the population in general will have the option of consuming Paca products as their price will be within their purchasing power.

3.6 Project strategy

3.6.1 Reasons for selection

(1) The essential reason for the project design is based on the following:

- The need to curb the destructive use of Paca in 4 million hectares of forest situated in the south-east of the country, by developing technologies and through capacity building, in order to facilitate the sustainable management and utilization of these forest products, ensure the conservation of the resource and increase the standard of living of the rural communities.

- The importance of preserving the Paca species as it is a potentially valuable resource and an alternative crop to coca plantations.

- The field demonstrations and training of the local communities will have a multiplier effect for the project, and this will be strengthened through programs to disseminate the results obtained and to highlight the qualities of Paca.

- In order to reach the proposed objectives, the project plans to establish an experimental area for the management of Paca and to build two pilot plants for the processing of Paca products.

3.6.2 Lessons drawn from past evaluation

The Paca Management and Utilization Project was developed after carrying out an analysis and evaluation of the situation of the species, taking into account the endangered nature of the species, the possibility of utilizing the species and the need of the local communities to have an economic alternative that will help them to improve their standard of living and at the same time curb the spread of coca plantations in the region.

Furthermore, the successful experiences that other countries are having with similar species, make it essential to implement a project that will research, promote and disseminate the appropriate technologies in our country.

3.6.3 Technical and scientific aspects

In order to develop management and utilization technologies for Paca it will be essential for the project to carry out research that will provide information on native Paca species such as their biological behaviour, management techniques, and physical and mechanical properties, among others. These are essential elements required to achieve the rational use of this resource.

The development of the bamboo industry in Asian countries is based on the results of scientific research; almost 150 research projects on different aspects of bamboo are implemented each year. Many of the technological processes and growth models that have been developed in these countries could be adapted in Peru for the harvesting and utilization of Paca.

3.6.4 Economic aspects

Resource potential

The area of distribution of Paca extends over more than 4 million hectares, so if the resource was utilized rationally, it would represent an enormous source of wealth.

Taking into account the vast areas of Paca in Peru it is obvious that major economic, social and environmental benefits could be derived through the appropriate and rational utilization of this forest species.

Asian countries have developed a profitable and booming industry based on the use of bamboo. For example, in 1994 an area of about 5,700 hectares of bamboo forest situated in the Anji county of China generated a total production of about US$110 million, with export figures of US$ 15.6 million dollars for the same year.

Potential markets

Although in general terms it is true that the Peruvian population do not use Paca specifically, they do use bamboo to a certain extent. According to official statistics, during the first quarter of 1996 the total imports of bamboo in Peru amounted to US$ 500,000 dollars. This would represent a yearly import quota of approximately US$ 2 million dollars. In 1988 the international trade of bamboo products was estimated at US 4.5 billion dollars. Many of the producer countries are in Asia and the countries in North and South America are consumers of different bamboo based products.

By developing appropriate technologies for Paca management and processing, Peru, a South American country which has extensive areas of Paca and is currently suffering a high level of unemployment, could satisfy the national demand for bamboo products and the surplus production could be sold in the international market, particularly in this part of the world.

3.6.5 Ecological/environmental aspects

The project is aimed at the protection of tropical moist forest resources and the conservation of the environment. Therefore, one of the most important aspects of the project will be to minimise the negative impacts on the resource in order to ensure its sustainable utilization.

3.6.6 Social aspects

The achievement of project objectives is based on the active participation of the local communities. Therefore, two important project components shall be communication and motivation so as to guarantee the full support of the local communities and to ensure that they are fully aware of the benefits the project can bring them.

Based on the results of the activities undertaken in the pre-project, there is currently a high level of expectation among the local community, who have indicated their desire to actively participate in this project.

There is no danger of a negative social impact as the transfer of technology for the processing of Paca products will be a simple and labour intensive process that will benefit the local communities.

3.6.7 Managerial aspects

Given the current institutional framework in Peru, the project will be implemented by the Ministry of Agriculture through INRENA.

In line with this decision, a **Steering Committee** will be established made up of the Head of INRENA, an ITTO representative, the General Forest Director and a representative of the Inca Agrarian Region. This committee will be responsible for the establishment of project policies, priorities and strategies and will monitor project activities.

3.7 Reasons for ITTO support

3.7.1 ITTO aspects

As stated in Part I of this document, this Project is consistent with ITTO policies and objectives as well as the basic priorities of ITTO Action Plan.

Peru needs international funding for the implementation of this project and as an ITTO member, it turns to the Organization as an institution with experience in the management of projects with short term tangible results.

3.7.2 Relationship to relevant actions supported by other donors

There are no other potential donors for the implementation of this project. Since the project involves the management and use of a moist tropical forest species, only ITTO has been approached for funding.

3.8 Risks

There are no risks that could hinder the implementation of this project because it constitutes an alternative for the local communities. Through the implementation of this project the communities can expect to learn how to manage and utilize this abundant and so far lesser-known species, that is currently being burned to clear the land for other uses.

4. OUTPUTS

The following outputs are expected to be produced after the three-year project implementation period:

OUTPUT No. 1

An experimental sustainable management and utilization model for Paca in an area of 2,000 ha.

OUTPUT No. 2

A training and promotion program on the management and uses of Paca.

OUTPUT No. 3

A pilot production plant for the canning of Paca shoots.

OUTPUT No. 4

A pilot production plant for the production of Paca rods.

5. ACTIVITIES AND INPUTS

Table 1 shows the main inputs required for each activity.

TABLE No. 1

MAIN INPUTS BY ACTIVITY										
OUTPUTS/ACTIVITIES	Technical team (m/m)	Sub-contracts (units)	Workers (m/m)	Travel (units)	Computer equip. (units)	Vehicles (units)	Plant equip. (units)	Tools	Office materials	Fuel & lubric. (gallons)
OUTPUT 1 Experimental management & utiliz. model										
Activities										
1.1 Gathering of inforrmation ...	27	1	72	6	1	1		several	several	500
1.2 Demarcation of pilot area ...	8		32					several	several	
1.3 Implementation and coord...	25		180	2				several	several	2500
1.4 Implem. of management plan	35		270					several	several	2500
1.5 Identifying harvesting techn...	3		15	1				several	several	500
OUTPUT 2 A training and promotion program...										
Activities										
2.1 Preparation of manual on...	4			1					several	
2.2 Preparation of manual...	4			1					several	
2.3 At least 4 courses on...	16			4					several	
2.4 Exhibition of Paca prod...	6			6						
2.5 Promotion through media...	16			8					several	
OUTPUT 3 Pilot plant for the canning...										
Activities										
3.1 Market survey and...	3			2					several	
3.2 Identification of processing...	4								several	
3.3 Selection and acquisition of...	3			1			1			
3.4 Building of facilities...	4	1	10					several		
3.5 Production tests & adjustments	11		71					several	several	4000

MAIN INPUTS BY ACTIVITY										
OUTPUTS/ACTIVITIES	Technical team (m/m)	Sub-contracts (units)	Workers (m/m)	Travel (units)	Computer equip. (units)	Vehicles (units)	Plant equip. (units)	Tools	Office materials	Fuel & lubric. (gallons)
OUTPUT 4 Pilot plant for the produciton of...										
Activities										
4.1 Market survey and...	3			2					several	
4.2 Identification of processing	4									
4.3 Selection and acquisition...	2			1			1		several	
4.4 Building of facilities &...	4	1	10					several		
4.5 Production tests & adjustments	11		60					several	several	4000

ACTIVITIES RELATED TO OUTPUT 1

- **Gathering of information and definition of research areas**

This is a basic and fundamental activity to achieve project objectives and outputs, considering the scarce information available on Paca. Thus, information on this species must be collected both locally and elsewhere, as well as information on management, utilization and processing of bamboo.

As part of this activity, two Peruvian technicians will be sent to countries with a high level of development in terms of bamboo management and utilization, so that they can become familiar with the appropriate technologies and can adjust and apply them to Paca in Peru.

In order to generate significant information, basic research areas must be defined, which will be implemented as early as possible so as to collect the necessary information in the short term and comply with the Project Work Plan.

- **Demarcation of pilot area and research plots**

A Paca forest area will be demarcated near Iñapari. The selected area will be government-owned and upon completion of the relevant arrangements, the boundaries will be demarcated using marking posts. The research plots will be established within this pilot area.

- **Implementation and coordination of research activities**

Specialized personnel with the support of international experts and field staff will be responsible for implementing and coordinating research activities.

- **Implementation of management plan**

The Management Unit will be responsible for formulating and implementing the Paca Management Plan for the pilot area.

- **Identification of utilization technologies**

The Processing Unit will be responsible for identifying adequate Paca technologies, taking into account the provisions of the Management Plan, sustained resource growth, species characteristics, and social conditions.

ACTIVITIES RELATED TO OUTPUT 2

- **Preparation of manual on Paca management**

On the basis of the information collected the Management Unit will prepare a user-friendly manual in plain language for the local communities.

- **Preparation of manual on Paca uses**

The Processing Unit will be responsible for preparing a detailed user-friendly manual on Paca products, including production of rods and canning of shoots.

- **At least four courses on Paca management and uses**

Each Project Unit will develop a course per year in their field of action to be held during the months of August-September in the second and third year of project implementation. These courses will have a minimum of 30 and a maximum of 50 trainees. Adequate training material should be developed so as to encourage the trainees to actively participate in the course and become a dissemination agent thus contributing to the multiplier effect of the project.

- **Exhibition of Paca products in at least 3 national and/or regional fairs**

As part of the strategy to introduce Paca products into the national market, the project will participate in major regional and/or national fairs. The Processing Unit will be in charge of this activity.

- **Promotion of Paca benefits in the media**

Both Project Units will prepare relevant material to be disseminated in the local media, promoting project objectives and outputs so as to encourage local communities to change their current Paca management practices and to find an economic alternative that will allow them to increase their income levels and/or avoid their involvement in illicit activities such as coca growing.

ACTIVITIES RELATED TO OUTPUT 3

- **Market survey and marketing strategies**

The Processing Unit will carry out a national market survey on potential demand for Paca shoots and will propose relevant marketing strategies.

- **Identifying processing technologies for the production and canning of Paca shoots**

The Processing Unit will identify the appropriate technology considering the raw material characteristics, available energy sources, social aspects, and other factors.

- **Selection and acquisition of machinery and equipment**

The Processing Unit will select and acquire the relevant machinery and equipment as required for the selected technology.

- **Building of facilities and installation of equipment**

The building of facilities will be sub-contracted following the dimensions and specifications established by the Processing Unit.

- **Production testing and adjustment**

ACTIVITIES RELATED TO OUTPUT 4

- **Market survey and marketing strategies**

The Processing Unit will carry out a national market survey on potential demand for Paca rods and will propose relevant marketing strategies.

- **Identifying processing technologies for the production of Paca rods**

The Processing Unit will identify the appropriate technology considering the raw material characteristics, available energy sources, social aspects, and other factors.

- **Selection and acquisition of machinery and equipment**

The Processing Unit will select and acquire the relevant machinery and equipment as required for the selected technology.

- **Building of facilities and installation of equipment**

The building of facilities will be sub-contracted following the dimensions and specifications established by the Processing Unit.

- **Production testing and adjustment**

6. PROJECT LOGICAL FRAMEWORK WORKSHEETS

The Project Logical Framework appears in the Annexes.

7. WORK PLAN

The Project Work Plan is shown in the Annexes.

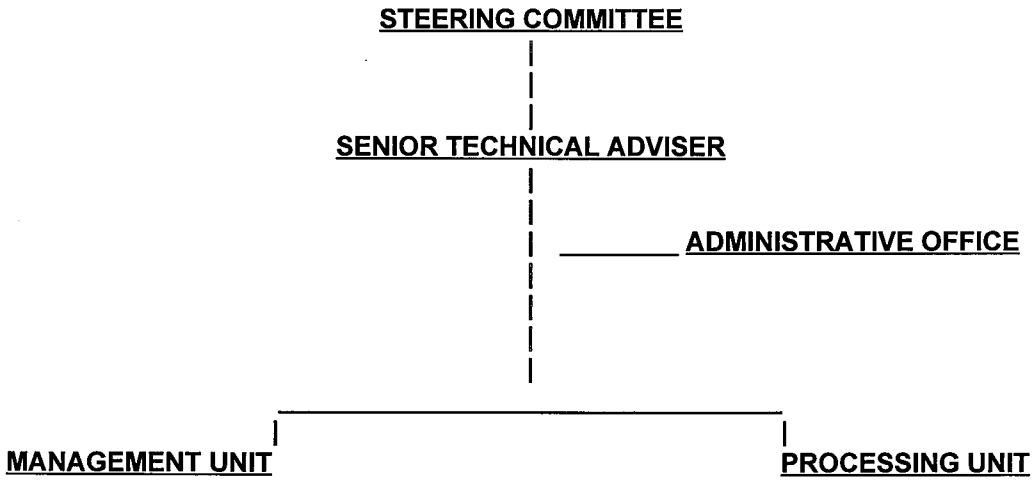
8. INSTITUTIONAL ARRANGEMENTS FOR EXECUTION AND OPERATION

8.1 Management structure

The Project Implementing Agency will be the National Institute for Natural Resources (INRENA) of the Ministry of Agriculture. The management structure of the project will comprise a **Steering Committee** made up of the Head of INRENA, an ITTO representative, the General Forest Director and a representative from the Inca Agrarian Region.

This Committee will meet at least twice a year to establish the policies and strategies to be followed by the Project, as well as the monitoring of project activities.

The Project Management Structure will be as follows:



8.2 Future operation and maintenance

The equipment, managed forests, industrial plants and other infrastructure acquired for the implementation of this Project will be under the responsibility of INRENA, that will be in charge of implementing follow-up activities.

INRENA and the Inca Regional Agrarian Directorate will include provisions in their annual budgets to cover project follow-up costs. The Government will thus ensure Project sustainability, as it has been established through Supreme Decree that all income generated through the sale of timber from government forests will be re-invested in forest activities.

8.3 Key staff

The Project Team will include three professionals -a National Consultant (Senior Technical Adviser - STA), a Forest Management Expert and a Forest Industry Expert. In addition, the project will be assisted by an International Forest Management Expert and an International Forest Industry Expert.

The minimum qualifications required for the key staff are shown below.

Senior Technical Adviser

Forestry Engineer with a Master's Degree or PhD in the field of forest management or forest industries and 10 years experience in this field.

Forest Management Expert

Forestry Engineer with a Master's Degree in the field of forest management and 5 years experience in this field.

Forest Industry Expert

Forestry Engineer with a Master's Degree in the field of forest industries and 5 years experience in this field.

International Forest Management Expert

Forestry Engineer with a Master's Degree or PhD in the field of forest management and 10 years experience in the management of bamboo species.

International Forest Industry Expert

Forestry Engineer with a Master's Degree or PhD in the field of forest industries and 10 years experience in the processing and marketing of bamboo products.

Table 2 shows project staff requirements.

TABLE No. 2

PERSONNEL BUDGET			
	PERSONNEL	US$/month	Total
01	Senior Technical Adviser (36 months)	3000	108000
01	Forest Industry Expert (36 months)	1500	54000
01	Forest Management Expert (36 months)	1500	54000
01	International Forest Industry Expert (12 months)	3000	36000
01	International Forest Management Expert (24 months)	3000	72000
01	Administrator (36 months)	800	28800
01	Secretary (36 months)	500	18000
01	Driver (36 months)	300	10800
01	Caretaker (36 months)	180	6480
20	Workers (36 months)	260	187200
	GRAND TOTAL (US$)		**575280**

9. PRIOR OBLIGATIONS AND PRE-REQUISITES

INRENA, as the Peruvian Government representative agency to ITTO, will be responsible for all preliminary activities and for concluding the Project Implementation Agreement. INRENA will appoint the project key and support staff.

10. POSSIBLE FUTURE ACTIONS

Upon project completion, INRENA and the Inca Regional Agrarian Directorate will be responsible for disseminating and applying project achievements over the 4,000,000 ha of Paca forests of the region, using their own resources and those allocated by the National Treasury.

The Project should provide information on regeneration patterns and cycles, management options, and Paca processing and industrialization. It should also provide solutions to the problems encountered and alternatives to meet needs. Furthermore, it should provide market information as well as information on other essential aspects related to Paca utilization and marketing.

PART III: MONITORING, REPORTING AND EVALUATION

1. ARRANGEMENTS FOR REPORTING

The project final report and six-monthly progress reports will be prepared in accordance with the provisions of the ITTO Project Manual. These reports will be prepared 4 weeks before each monitoring mission and will contain information on project performance for each project element.

The above information will be based on the attached logical framework worksheets. The documents will be submitted following the standard format for progress and final reports as established in the ITTO Manual for Project Formulation (December 1992), Annexes B and C.

2. ITTO MONITORING AND EVALUATION

ITTO participation in both annual meetings is recommended, independently of any monitoring missions sent by ITTO.

The proposed schedule for the meetings is as follows:

Year 1
1st day of month 6 of project implementation
1st day of month 12 of project implementation

Year 2
1st day of month 18 of project implementation
1st day of month 24 of project implementation

Year 3
1st day of month 30 of project implementation
1st day of month 36 of project implementation

3. EVALUATION

The project progress reports will be completed and submitted to ITTO 4 weeks in advance of the above dates so as to provide the relevant information in time for the corresponding missions. This will apply to the 3 years of project implementation.

The project final report will be completed by the end of the 3rd year of project implementation.

PART IV: PROJECT BUDGET

1. OVERALL PROJECT BUDGET BY COMPONENT
2. PROJECT BUDGET BY FINANCING SOURCE
3. PROJECT BUDGET BY YEAR, FINANCING SOURCE AND COMPONENT
4. OVERALL PROJECT BUDGET BY ACTIVITY

OVERALL PROJECT BUDGET (in US$)

(For a complete overall budget table, see original Spanish document - page 26)

10. PROJECT PERSONNEL
    11. National Experts (36 months)
        1 Senior Technical Adviser - US$3000.00/month
        1 Forest Industry Expert - US$1500.00/month
        1 Forest Management Expert - US$1500.00/month
    12. Administrative personnel
    15. Fellowships and training
    16. International Experts
        1 Forest Industry Expert - US$3000.00/month/12 months
        1 Forest Management Expert - US$3000.00/month/24 months
    14. Other labour
    19. Component Total

20. SUB-CONTRACTS
    21. Sub-contract - building shoot processing plant
    22. Sub-contract - bulding rod processing plant
    23. Sub-contract - Study on physical-mechanical properties
    29. Component Total

30. DUTY TRAVEL
    31. DSA
    32. Transport costs
    39. Component Total

40. CAPITAL ITEMS
    41. Premises
    42. Land
    43. Capital equipment
    49. Component Total

50. CONSUMABLE ITEMS
    51. Raw materials
    52. Spares
    53. Utilities
    54. Office supplies
    55. Fuel and lubricants
    59. Component Total

60. MISCELLANEOUS
    61. Sundry
    62. Refund of Pre-project costs
    69. Component Total

70. ITTO MONITORING, EVALUATION AND ADMINISTRATION
    71. Monitoring and evaluation
    72. Administrative costs
    79. Component Total

99. GRAND TOTAL (US$)

PROJECT BUDGET BY FINANCING SOURCE (in US$)

(For a complete version of this table, see original Spanish document - page 27)

FINANCING SOURCE	ITTO	NATIONAL
10. PROJECT PERSONNEL 11. National Experts (36 months) 1 Senior Technical Adviser - US$3000.00/month 1 Forest Industry Expert - US$1500.00/month 1 Forest Management Expert - US$1500.00/month 12. Administrative personnel 15. Fellowships and training 16. International Experts 1 Forest Industry Expert - US$3000.00/month/12 months 1 Forest Management Expert - US$3000.00/month/24 months 14. Other labour 19. Component Total		
20. SUB-CONTRACTS 21. Sub-contract - building shoot processing plant 22. Sub-contract - bulding rod processing plant 23. Sub-contract - Study on physical-mechanical properties 29. Component Total		
30. DUTY TRAVEL 31. DSA 32. Transport costs 39. Component Total		
40. CAPITAL ITEMS 41. Premises 42. Land 43. Capital equipment 49. Component Total		
50. CONSUMABLE ITEMS 51. Raw materials 52. Spares 53. Utilities 54. Office supplies 55. Fuel and lubricants 59. Component Total		
60. MISCELLANEOUS 61. Sundry 62. Refund of Pre-project costs 69. Component Total		
70. ITTO MONITORING, EVALUATION AND ADMINISTRATION 71. Monitoring and evaluation 72. Administrative costs 79. Component Total		
99. GRAND TOTAL (US$)		

CONSOLIDATED YEARLY PROJECT BUDGET (in US$)
ITTO CONTRIBUTION

ANNUAL DISBURSEMENTS / BUDGET COMPONENTS	TOTAL	YEAR 1	YEAR 2	YEAR 3
10. Project personnel				
20. Sub-contracts				
30. Duty Travel				
40. Capital items				
50. Consumable items				
60. Miscellaneous				
70. ITTO Admin., monitoring & eval.				
99. GRAND TOTAL (ITTO Cont.)				

CONSOLIDATED YEARLY PROJECT BUDGET (in US$)
NATIONAL CONTRIBUTION

ANNUAL DISBURSEMENTS / BUDGET COMPONENTS	TOTAL	YEAR 1	YEAR 2	YEAR 3
10. Project personnel				
20. Sub-contracts				
30. Duty Travel				
40. Capital items				
50. Consumable items				
60. Miscellaneous				
70. ITTO Admin., monitoring & eval.				
99. GRAND TOTAL (National Cont.)				

(For a full version of these tables, see original Spanish document - page 28)

OVERALL PROJECT BUDGET BY ACTIVITY (in US$)

(For a complete version of this table, see original document - page 29)

OUTPUTS/ACTIVITIES	Project Personnel	Sub-contracts	Duty Travel	Capital Items	Consumable Items	Miscellaneous	Monitoring & Evaluation	GRAND TOTAL
OUTPUT 1 Experimental management & utilization model ACTIVITIES 1.1 1.2 1.3 1.4 1.5								
Sub-total - Output 1								
OUTPUT 2 Training and promotion program ACTIVITIES 2.1 2.2 2.3 2.4 2.5								
Sub-total - Output 2								
OUTPUT 3 Pilot plant for production & canning of Paca shoots ACTIVITIES 3.1 3.2 3.3 3.4 3.5								
Sub-total - Output 3								
OUTPUT 4 Pilot plant for production of Paca rods ACTIVITIES 4.1 4.2 4.3 4.4 4.5								
Sub-total - Output 4								
GRAND TOTAL								

WORK PLAN

(For a complete version of this table, see original document - page 30)

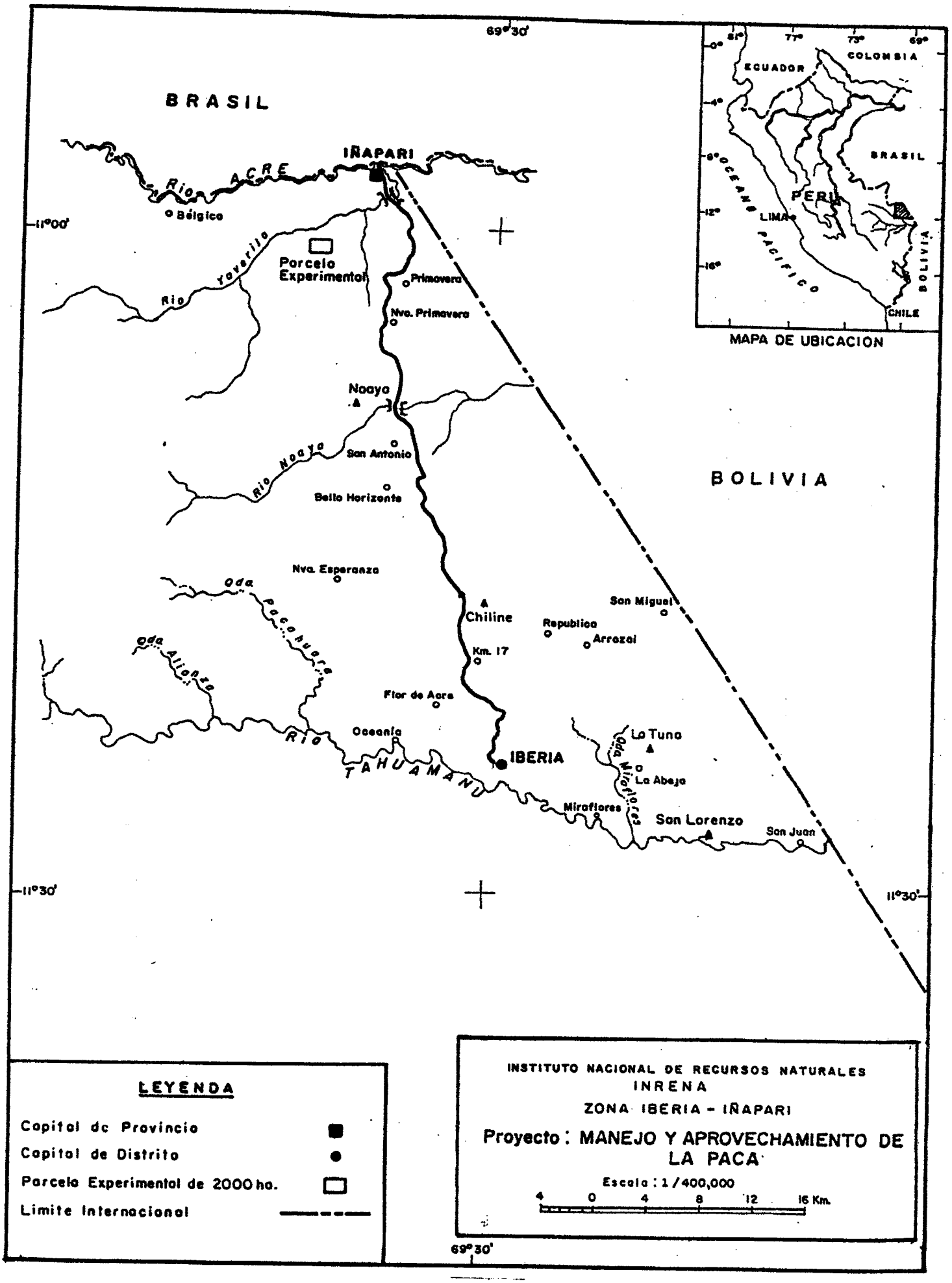
Outputs/Activities	SCHEDULE IN MONTHS		
	1 2 3 4 5 6 7 8 9 10 11 12	13 14 15 16 17 18 19 20 21 22 23 24	25 26 27 28 29 30 31 32 33 34 35 36
OUTPUT 1 Experimental management & utilization model ACTIVITIES 1.1 1.2 1.3 1.4 1.5			
OUTPUT 2 Training and promotion program ACTIVITIES 2.1 2.2 2.3 2.4 2.5			
OUTPUT 3 Pilot plant for production & canning of Paca shoots ACTIVITIES 3.1 3.2 3.3 3.4 3.5			
OUTPUT 4 Pilot plant for production of Paca rods ACTIVITIES 4.1 4.2 4.3 4.4 4.5			

LOGICAL FRAMEWORK MATRIX

PROJECT ELEMENTS	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
DEVELOPMENT OBJECTIVE To develop knowledge and technologies on Paca management and utilization so as to improve the standard of living of the rural population and to ensure the conservation and preservation of moist tropical forest ecosystems and biodiversity in Peru.	Increased understanding of management and utilization of moist tropical forest species	- Technical documents - Statistical reports on increased consumption of products from moist tropical forests - Moist tropical forest areas under management	
SPECIFIC OBJECTIVE To manage and utilize Paca with the two-fold aim of generating work and income for the Iñapari population and to ensure the conservation of this resource.	- Information available on Paca management - Generation of employment and improved income levels for the Iñapari communities based on Paca management and utilization	- Technical report on Paca species - Increased number of forest permits for Paca management - Statistical reports on increased Paca products and by-products	- Community acceptance - Government willingness to manage and utilize Paca - Existence of over 4,000,000 ha of Paca forests - The communities need to have alternative income generating sources - External financial support
OUTPUT 1 An experimental sustainable management and utilization model for Paca in an area of 2,000 ha.	- A Paca forest area under management and experimental harvesting	- 2000 ha of Paca forests located, demarcated and brought under management and harvesting plans	- Availability of Paca forests for experimental harvesting and management - Skilled technical personnel - Technical cooperation funding
OUTPUT 2 A training and promotion program on the management and uses of Paca.	- Training courses - Promotion activities on Paca management and uses	- Reports by course participants - Fair exhibition credentials - Contracts with local media	- Community interest in training - Existence of regional and national fairs - Existence of communication media
OUTPUT 3 A pilot production plant for the canning of Paca shoots.	- Operational pilot plant for the production and canning of Paca shoots	- Production reports	- There is a demand for shoots - Availability of information on marketing - Availability of technologies
OUTPUT 4 A pilot production plant for the production of Paca rods.	- Operational pilot plant for the production and canning of Paca rods	- Production reports	- Availability of information on marketing - There is a demand for bamboo rods - Availability of technologies

PROJECT ELEMENTS	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
ACTIVITIES RELATED TO OUTPUT 1			
- Gathering of information and definition of research areas	- Report on Paca identification, taxonomy, growth and physical and mechanical properties	- Technical reports - Publications - Research plan - Management Plan document	
- Demarcation of pilot area and research plots	- 2000 ha of Paca forests demarcated including research plots	- Location maps and markers	
- Implementation and coordination of research activities	- Basic research on Paca management and utilization under implementation	- Technical reports	
- Implementation of management plan	- Experimental management plan under implementation	- Technical reports	
- Identification of utilization technologies	- Selection of appropriate technology for Paca utilization in Iñapari	- Utilization Plan document	
ACTIVITIES RELATED TO OUTPUT 2			
- Preparation of manual on Paca management	- Paca management techniques selected	- Manual on Paca management	
- Preparation of manual on Paca uses	- Paca utilization techniques selected	- Manual on Paca utilization	
- At least four courses on Paca management and uses	- At least 4 courses on Paca management and use held	- List of course participants - Course reports - Training programs and materials	
- Exhibition of Paca products in at least 3 national and/or regional fairs	- Presentation of Paca products in at least 3 major fairs in the country	- Proof of registration - Product acceptance and sales reports - Printed publicity and promotion material	
- Promotion of Paca benefits in the media	- Radio and television programs broadcast	- Broadcasting contracts	
ACTIVITIES RELATED TO OUTPUT 3			
- Market survey and marketing strategies	- Market research on Paca shoots implemented	- Technical report	
- Identifying processing technologies for the production and canning of Paca shoots	- Technology for production and canning of Paca shoots selected	- Technical report	
- Selection and acquisition of machinery and equipment	- Machinery and equipment for Paca shoots processing acquired	- Invoices - Import records	
- Building of facilities and installation of equipment	- Paca shoots processing facilities built and equipment installed	- Building and installation contracts concluded - Delivery records	
- Production testing and adjustment	- Production plant tested and operational	- Technical report - Production report	

PROJECT ELEMENTS	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
ACTIVITIES RELATED TO OUTPUT 4			
- Market survey and marketing strategies	- Market research on Paca rods implemented	- Technical report	
- Identifying processing technologies for the production of Paca rods	- Technology for production of Paca rods selected	- Technical report	
- Selection and acquisition of machinery and equipment	- Machinery and equipment for Paca rods processing acquired	- Invoices - Import records	
- Building of facilities and installation of equipment	- Paca rods processing facilities built and equipment installed	- Building and installation contracts concluded - Delivery records	
- Production testing and adjustment	- Production plant tested and operational	- Technical report - Production report	


69°30'
BRASIL
IÑAPARI
Río ACRE
Bélgica
11°00'
Río Yavarija
Porcelo Experimental
Primavera
Nva. Primavera
Noaya
Río Noaya
San Antonio
Bello Horizonte
Nva. Esperanza
Oda Pacahuera
Oda Alianza
Chiline
Km. 17
Flor de Acre
Oceanía
RIO TAHUAMANU
IBERIA
Republica
Arrazal
San Miguel
La Tuna
Oda Miraflores
La Abeja
Miraflores
San Lorenzo
San Juan
BOLIVIA
11°30'
11°30'
69°30'
81°
77°
73°
69°
0°
4°
8°
12°
16°
COLOMBIA
ECUADOR
BRASIL
PERU
LIMA
OCEANO PACIFICO
BOLIVIA
CHILE
MAPA DE UBICACION
LEYENDA
Capital de Provincia
Capital de Distrito
Parcela Experimental de 2000 ha.
Limite Internacional
INSTITUTO NACIONAL DE RECURSOS NATURALES
INRENA
ZONA IBERIA - IÑAPARI
Proyecto: MANEJO Y APROVECHAMIENTO DE LA PACA
Escala: 1/400,000
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