INTERNATIONAL TROPICAL TIMBER ORGANIZATION

ITTO

SMALL PROJECT DOCUMENT

TITLE	GUIDELINES FOR THE MANAGEMENT OF TARA (*Caesalpinea spinosa*) PLANTATIONS WITH A VIEW TO THE REHABILITATION OF WASTE LANDS IN THE SUB-HUMID TROPICS OF THE COASTAL REGION OF PERU
SERIAL NUMBER	PD 724/13 Rev.1 (F)
COMMITTEE	REFORESTATION AND FOREST MANAGEMENT
SUBMITTED BY	GOVERNMENT OF PERU
ORIGINAL LANGUAGE	SPANISH

SUMMARY

This small project proposal has derived from project PD 583/10 Rev.1 (F), which was implemented to assess the feasibility of restoring arid or sub-humid ecosystems in the southern coastal region of Peru and which has proven to be highly beneficial from an environmental and socioeconomic viewpoint after reforesting 75 hectares with *Caesalpinea spinosa* in *eriaza* (waste) lands that previously had no economic or environmental value.

As a result of that project phase, it has been possible to develop a new flora and fauna ecosystem of considerable significance and the future outlook of nearly one million hectares in this Peruvian coastal ecosystem has been improved by contributing not only to the socioeconomic development of the region but also to carbon sequestration, increasing CO_2 storage levels from 0 to an average 8-10 Mt/ha/year. This is fully consistent with the concepts and strategies of climate change mitigation and rehabilitation of degraded forest lands.

This project will be implemented in the Department of Arequipa, Province of Camaná, in Southern Peru. Given its ecological, environmental and socioeconomic conditions, this region is highly significant and representative of tropical semi-arid or sub-humid areas in Peru, where social, economic and environmental alternatives need to be adjusted to the shortage of water for both irrigation and human consumption, so as to generate economic income to help improve the living standards of the rural population. The specific objective of the project is to develop guidelines for SFM and agroforestry systems with a view to the rehabilitation of degraded lands in the Peruvian coastal region and develop a technological package that can be used for reforestation with *Caesalpinea spinosa* and agroforestry systems.

The following outcomes are expected to be produced by the end of the project: i) Consolidation of technical experiences in the management and competitive production of Tara in the southern coastal region of Peru through a high productivity module; ii) Development of a technological package for the management of Tara and associated agroforestry systems; and iii) Guidelines for SFM in Tara plantations and rehabilitation of degraded and *eriaza* lands to be applied throughout the coastal region of Peru.

EXECUTING AGENCY	APAIC – ASOCIACION PRO DESARROLLO AGROINDUSTRIAL DE CAMANA	
COLLABORATING AGENCIES	--	
DURATION	24 MONTHS	
APPROXIMATE STARTING DATE	UPON APPROVAL	
BUDGET	**Source**	**Contribution (in US$)**
	ITTO	**149,632**
	APAIC	215,310
	TOTAL	**364,942**

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ACRONYMS AND ABBREVIATIONS

AGRO-RURAL	MINAG's Programme for Rural Agricultural Production Development
APAIC	Asociación Pro Desarrollo Agroindustrial de Camaná (*Association for Agro-Industrial Development in Camana*)
DGFFS	General Forest Directorate of MINAG
ECOBONA	Programme of the Swiss Cooperation Agency for the Management of Andean Forests
ITTO	International Tropical Timber Organization
MINAG	Ministry of Agriculture, Peru
NGO	Non-governmental organization
NTFP	Non Timber Forest Product
PIU	Project Implementation Unit

PART I. PROJECT CONTEXT

1.1 Origin

This small project proposal stems from the recommendation made during the last meeting of the Steering Committee of Project PD 583/10 Rev.1 (F) regarding the need to develop guidelines for the sustainable management of Tara plantations and the rehabilitation of degraded and *eriaza* (waste) lands in the Peruvian coastal region for the possible implementation of a national programme based on the consolidation of afforestation and reforestation activities with *Caesalpinea spinosa* in agroforestry systems. Since Peru is the world's main producer of this non-timber forest species (accounting for nearly 80% of the world production of Tara), it can be turned into a significant alternative for rural development and the alleviation of poverty in economically depressed areas with increasing involvement in the national and international markets and mitigation of climate change effects.

Given its multiple pharmaceutical and industrial uses and its increasing global demand (Italy, China, Germany, USA, Argentina and Brazil, among others), Tara has become an attractive commodity in the international market; however, the Tara production chain is completely fragmented, with individual small and medium scale producers who, for the most part, are not organized or united and, therefore, depend on middlemen and transport operators. Nevertheless, the production potential of Tara is quite substantial considering that there is an estimated global demand of around 40,000 tons per year. Peru is the main world exporter with nearly 18,000 tons, which accounts for almost 80% of the total global production, leaving an unmet demand of nearly 20,000 tons per year.

ITTO has financed a small project [PD 583/10 Rev.1 (F)] for small scale (100 ha) Tara growing and production in the southern region of Peru, which has attracted the interest of many farmers in the surrounding areas, who are establishing new plantations with very promising results, and large areas are beginning to be reforested with Tara along the southern Peruvian coast. However, many of these plantations are being established by small farmers and rural communities that do not have a good technical basis and there is now an evident fragmentation of the entire production chain.

In this context, it is important and timely to support the growing, production, processing and marketing of Tara products and associated agroforestry systems in the southern coastal region of Peru as an excellent alternative for the rehabilitation of degraded lands. The major benefit of this species is that it is possible to harvest the fruit without affecting the tree, which has a productive life of more than 30 years (in Ayacucho and Cajamarca, Peru, there are trees more than 60 years old that are still productive). If the production chain of Tara is not properly consolidated, the resulting products may not be competitive due to the loss of markets, and if this production activity were to be discontinued, the economic well-being of thousands of families could be greatly affected.

1.2 Relevance

This project is clearly relevant when considering the current outlook and prospects at the national and international levels, particularly in relation to the implementation of forest and agroforestry activities which represent excellent alternatives to land and forest ecosystem degradation and the indiscriminate logging of natural forests, which are precisely the main concerns of ITTO.

Environmental relevance: this is an environmentally friendly crop that contributes to the rehabilitation of forest landscapes and to the improvement of soil conditions and the development of biodiversity, which does not require the use of pesticides or chemical fertilizers. Because only the fruits are harvested and the stems are not cut, this crop can generate important volumes of biomass and carbon storage potential at very low costs. Furthermore, the crop only needs very small volumes of water and can be grown in marginal soils.

Social and economic relevance: this is a crop that is well suited for a family farm or for small and medium farmers; it has a high yield rate per hectare in marginal soils and therefore it does not compete with other agricultural or forest products. It contributes to participatory approaches during the production, processing and marketing phases; as was previously mentioned, more than 80% of production is sourced from small farms and small-scale producers. It is estimated (ECOBONA 2009) that in Peru alone there are more than 40,000 families directly or indirectly involved in the Tara production chain (the great majority of these families own farms that range from 0.1 to 2.0 hectares) and that in 2009 more than 30,000 tons of Tara pods were produced.

Technological relevance: The silvicultural management of this species is relatively easy despite the fact that there is an enormous scope for scientific and applied research, including: selection of varieties, sites, germplasm banks, processing of primary products and higher value-added products, market chains and others.

1.2.1 Conformity with ITTO's policies

One of the main ITTO objectives set out in the ITTA is to promote the sustainable management of tropical timber producing forests, with which this project is consistent as follows:

a. Providing an effective framework for consultation, international cooperation and the development of policies aimed at sustainable and integrated forest development, as the successful implementation of this project at the local level may be replicated in other regions of Peru and neighbouring countries such as Ecuador and Bolivia.

b. Even though this project is not directly aimed at the production of timber, it will still make a significant contribution to integrated forest utilization based on non-timber forest products, and this will have an impact on the reduction of community pressure on natural forests and their logging.

c. The proposal is fully consistent with objective (c) of the ITTA as it will contribute to poverty alleviation by promoting economic activities as an alternative to forest logging and providing significant economic income to poor families.

d. The proposal is also consistent with objective (g) of the ITTA as it will develop mechanisms for the provision of new and additional financial resources with a view to promoting the adequacy and predictability of funding and expertise needed to enhance the capacity of producer members, as well as objective (i) as it will promote increased and further processing of tropical timber from sustainably managed sources in producer member countries, with a view to promoting their industrialization and thereby increasing their employment opportunities and export earnings.

In particular, this project is fully consistent with the ITTO Guidelines for the Restoration, Management and Rehabilitation of Degraded and Secondary Tropical Forests.

The following principles have specifically been taken into account:

Principle 1: Degraded and secondary forests need to be seen as integral parts of the rural tropical landscape that are affected by off-site conditions. Restored primary forests, managed secondary forests and rehabilitated forests lands can provide numerous benefits and services to society, taking into consideration the following actions:

- Incorporate degraded and secondary forests into land-use planning at the micro and macro scales.
- Establish integrated land-use plans that reflect an appropriate balance between conservation, production and sustainable livelihood needs from forests.
- Explore options for restoration and rehabilitation before allocating degraded and secondary forests to non-forest uses.

The project is precisely focused on degraded lands as a core element, proposing their restoration and sustained management as a strategy for the rehabilitation of rural landscapes through reforestation with Tara and associated agroforestry systems, an approach that has proven to be highly effective in both environmental and economic terms.

Principle 5: Secure land tenure, land-user access, customary rights and property rights are fundamental to the restoration, management and rehabilitation of degraded and secondary forests.

Principle 8: Local communities and stakeholders actively participate in and share the responsibility for decision-making in planning and implementing restoration, management and rehabilitation strategies.

The previous project [PD 583/10 Rev.1 (F)] has carried out extensive participatory work with small farmers and local authorities in its area of influence and has therefore established a sound and sustainable basis for the implementation of activities and the achievement of the outcomes proposed for this new phase, which has become evident through the multiple expressions of support, agreements and requests submitted by

these communities and authorities to continue working on the management and production chains of bamboo and other related species.

Principle 11: The appropriate land-use option for a given site needs to be chosen carefully.

The areas of highest priority and significance for the management of Tara have been identified during the first phase. Thus, the areas where this project is to be implemented have been carefully selected.

1.2.2 Relevance to Peruvian policies and strategies

The Peruvian Government promotes the sustainable use of forest resources and their industrial and non-industrial processing, particularly where such activities are aimed at generating more jobs and at sustainable socioeconomic development of poor rural communities. However, more financial and technological resources are required for this to have a significant socioeconomic and environmental impact and to benefit the neediest sectors of the population.

In this context, it is worth noting the outcomes of project PD 583/10 Rev.1 (F), which have been highly appreciated by the regional governments of the Departments of Arequipa and Moquegua (Southern Coastal Region of Peru). At different times and in different ways, these governments have expressed their desire to continue these efforts and further advance the technological and socioeconomic aspects of the process. This project proposal has been developed in response to those expressions of interest. It should not necessarily be considered as a follow-up or second phase of the aforementioned project but rather as a result of its implementation. This new proposal is focused on the strengthening of aspects such as management plans, development of processing techniques and satisfaction of current domestic market demand for added-value products.

The Plan of the current Government of Peru, in its Objective Four related to Social Justice, Chapter B: Agriculture and Rural Development, item 242, decides: “to declare the promotion and development of Tara crops as a matter of national priority interest, and to this end, the General Forest and Wildlife Directorate (DGFFS) of MINAG has developed forest management guidelines for natural Tara forest stands”, with a view to promoting the production and marketing of products derived from forest management and plantations.

It is in this framework that this project proposal has been developed, identifying the following limiting factors to reduce the degradation of lands in the Peruvian coastal region and promote their sustainable use:

1. The limited or almost non-existent skills and dissemination of intermediate techniques for the rehabilitation and management of *eriaza* lands in the coastal region;
2. Lack of training and promotion of techniques (know-how) in sustainable management and value-added processing in the region;
3. The almost complete absence of viable alternatives for sustainable socioeconomic development in the Peruvian coastal region, where natural Tara formations in the so-called “lomas” are currently disappearing.

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 utilization 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, as established in SD No. 003-2005-AG, stressing the importance of reforestation, and SR No. 002-2006-AG, approving the National Reforestation Plan.

The Organic Law for the Sustainable Utilization of Natural Resources – Act No. 26821 clearly establishes that INRENA (now DGFFS/MINAG) is the National Forest Authority and as such, it is responsible for the management and commercial utilization of timber and non-timber resources; in other words, it is responsible for the use of Tara from natural forests and plantations.

Since Tara is a NTFP, a permit from the relevant authority is required for its harvesting and utilization. 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 natural forests or plantations. The implementation of

these policies and regulations is based on the concept of sustainable use of resources and on the recognition that these resources provide economic benefits to the communities that use them.

1.3 Target Area

The project's area of influence is located within the micro zone known as Pampas del Huevo of the Camaná Province, District of Mariscal Cáceres, in the south coast of Peru, on extremely arid lands with high salinity soils which are representative of the coastal region of the country. The Mariscal Cáceres District, popularly known as San José, is one of the 8 districts that make up the Province of Camaná in the Department of Arequipa, under the jurisdiction of the Regional Government of Arequipa, Southern Peru.

Average annual temperature: 20 degrees C
Annual precipitation : 100 mm

2010 Google satellite images of the Tara plots established by project PD 583/10 Rev. 1 (F)

The Department of Arequipa has a total population of approximately 3 million, with 40% living in rural areas, in the upper sections of the Department. These communities are characterized by their extreme poverty levels (30%) and their main activities are subsistence agriculture and cattle-ranching. Informal small-scale mining activities are also included among the economic activities of the Department. The Province of Camaná has a predominantly agricultural economy that is almost exclusively focused on the growing of rice, onion and beans. These crops require large volumes of water and the arid and semi-arid lands of the province have a serious shortage of water, which significantly limits their production potential. However, general climate conditions (temperature and sunlight) show great potential for the development of alternative activities requiring limited water quantities such as Tara production.

A large proportion of the available manpower works in the sowing and harvesting of traditional crops. These workers come down from the Andean highlands and a good percentage of them stay in the coastal region in search of job opportunities and access to land; however, they have neither financial resources nor technical skills to work on alternative activities such as agroforestry or reforestation.

1.4 Baseline information

According to the outcomes of previously implemented project PD 583/10 (F), the main aspects making up the baseline for this project are as follows:

Bio-physical aspects

The project's target area covers approximately 3,300 hectares of *eriaza* (waste) lands, 1500 hectares of which have been designated as rural expansion areas by the municipal government of Mariscal Castilla. The remaining 1800 hectares comprise 1000 hectares that are suitable for inclusion in a rehabilitation plan for *eriaza* lands, preferably through reforestation with species that may adapt to high salinity soils requiring low irrigation levels and agroforestry systems, and 800 hectares that may be incorporated into these systems in the future once they are established and their economic viability has been validated.

Out of the 1000-hectare area suitable for rehabilitation (part of which includes old *lomas* or formations dependent on atmospheric associations) nearly 100 hectares have already been reforested and rehabilitated (75 hectares through PD 583/10 (F)) through Tara, Olive, Tamarix and Casuarina plantations, sometimes associated with other herbaceous leguminous species.

Social aspects

The Mariscal Castilla District has a population of approximately 6,000; however, it has an increasing immigration rate with people coming from the high Andean region, particularly Puno, which may soon lead to problems in basic services (water, sewerage, electricity). The valley area currently receives a fairly large floating migrant worker population during rice sowing and harvesting seasons, probably representing about 30% increase on the stable population.

Almost the entire population is involved in the farming of rice, onion and bean crops so virtually all other food products need to be imported. Poverty rates are still high (25%) and there is an alarming lack of opportunities in the production sector as no alternative production activities have been developed.

Project PD 583/10 (F) has contributed to grouping close to 30 families, who currently have one 15-hectare plot each, and these are the target areas for the reforestation and agroforestry program over the next 5 years.

1.5 Expected outcomes at project completion

After project completion, guidelines for **tara plantations and** the rehabilitation of degraded lands in the coastal region of Peru will have been developed and validated, which will make a significant contribution to the restoration of lands in the South American semi-arid landscape.

Furthermore, a modular technological package will have been developed. This package may later be replicated in similar environmental conditions and will benefit a large number of small and medium scale farmers who currently have no access to this type of technology.

In addition, the project will have established the basis for the design and organization of a national program or plan for the reforestation and rehabilitation of degraded lands in the Peruvian coastal region.

PART II. PROJECT RATIONALE AND OBJECTIVES

2.1 Stakeholder analysis

The objective of the project is to provide direct and indirect benefits to the various stakeholders in the departments within its target area (Arequipa) as well as other departments along the Peruvian coast. In this context, it is considered that in rural community areas, the direct beneficiaries will be small farmers and, in general, low-income rural dwellers living in the project's direct area of influence.

Direct users or beneficiaries will be the members of the Association for Agro-Industrial Development in Camana (Asociación Pro Desarrollo Agroindustrial de Camaná – APAIC), either as individuals or families. In the former case, users will be the direct beneficiaries in the work done by the project such as production of plants in nurseries, planting and maintenance, and primary processing and marketing. They will also be involved at the individual level in short training courses and workshops, plantations, and forest nurseries. In all these cases community member involvement will be through and after coordination with community and local government (municipalities) authorities and after the relevant work plan has been approved.

Local governments or municipalities will also be primary stakeholders and direct beneficiaries in the project, as they will carry out production activities to benefit the population of their areas, will train their officials, will establish production and training infrastructure, and will design projects, plans and programs for local and community development.

Even though more than 50% of the project's direct beneficiaries already are women, efforts will still be made to maintain this ratio and to continue encouraging equal gender involvement as well as the participation of young people interested in the development of innovative agro-activities in the province. This approach is particularly important in a province with a predominantly farming society where the "macho culture" still prevails. The project will develop specific activities to improve the involvement of young people and women.

In brief, the direct or primary beneficiaries of the project will be:

- Small farmers
- Community leaders
- Local and regional forest authorities
- Local and regional governments

Indirect project stakeholders and beneficiaries will include:

- Local private, non-profit organizations
- Local and regional academic institutions
- MINAG, MINAM

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

- Rehabilitation of degraded forests and lands,
- Forest land-use planning and sustainable forest management,
- Valuation of degraded lands,
- Valuation of the utilization of non-timber forest products

2.2 Problem analysis and rationale

The project is based on the fact that as a result of the implementation of project PD 583/10 Rev. 1 (F), an important initiative on the establishment of Tara plantations, mainly belonging to small farmers, is taking place in the south of Peru, in the department of Arequipa. The plantations are somewhat dispersed, have low levels of productivity and lack a formal government promotion program for this type of activities. At the same time, the demand for Tara products has steadily increased; however, 90% or more of these small farmers can only sell their dry raw materials (pods) to large middlemen, intermediaries and industrial plants. It is therefore urgent and necessary to implement a robust, efficient and competitive production chain that will bring together small and medium producers, from the cultivation phase up to the export of the industrially processed products, thus ensuring substantial improvements in their production quality, sale prices and, as a result, a significant improvement in their family incomes, raising the per capita GDP by a minimum of 30%.

The problem with the Peruvian coastal areas is that due to the lack of moisture and water for the development of agricultural and forestry activities, a high percentage of the lands in the area are unproductive and uncultivated and without future prospects of use. However, it is precisely along the Peruvian coastline that the majority of the national population is settled and this population is in fact growing year after year due to the migrations from the Andean region, where there is also the problem of a lack of lands for agricultural and cattle ranching activities. As a result of this, many of these migrants go to the Amazon region and immediately implement activities that worsen the land-use problem by deforesting these areas, with already well known impacts in the climate change context.

The migrant populations going to the coastal areas, mainly landless farmers, settle in these areas in unhealthy conditions and create social problems when they do not find economic alternatives in the short term to help them improve their living standards due to the lack of opportunities in the agricultural and forestry sectors, which is precisely where they can better develop their traditional skills. In this regard, the development of forest plantation activities with species that require minimum irrigation water is highly relevant and can perfectly be integrated into agroforestry systems. This constitutes a real opportunity that can turn into a concrete alternative, and this is reinforced by the success achieved in the implementation of project PD 583/10 Rev.1 (F), which obtained important results and provided invaluable experiences that will be used to guide the implementation of a national reforestation program in arid or sub-humid tropical lands like those found in the coastal areas of Peru.

The water shortage along the Peruvian coastline is being addressed through the use of drip irrigation systems, with a minimum of water being used per plant. For example, in the case of Tara, project PD 583/10 Rev.1 has shown that with irrigation volumes of 2,000 to 3,000 m^3 of water/ha/year for a Tara plantation of 625 plants (4x4m spacing), it is possible to maintain the plantation and production under good conditions, compared to the 20,000 to 50,000 m^3 that other traditional coastal crops require (sugar cane, rice, fruit trees, onions, etc.), or in other words 10 to 20 times less demand for water. The other problem stems from the lack of knowledge and experience of farmers with this type of crops in agroforestry systems together with the lack of information and knowledge about these activities that state agencies have on these issues.

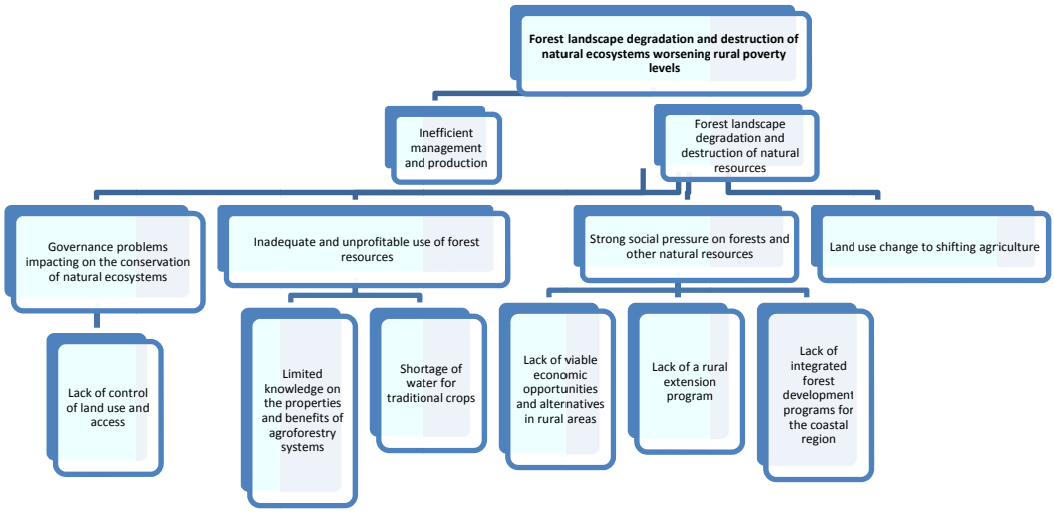
The project rationale is based on the wide availability of lands in need of rehabilitation along the Peruvian coastline, the enormous social pressure placed on this region by the migrant Andean communities, who come in search of economic opportunities (work, lands) and the enormous potential that forestry and agroforestry activities represent, particularly those with minimum water requirements and affordable implementation costs. These reforestation activities will be based on the use of *Caesalpinea spinosa* and other associated crops in agroforestry systems, particularly with leguminous species. Finally, there are advantages in only utilizing the fruits of a permanent crop, leaving the plant untouched, as they are excellent tools for sequestering carbon, with accumulations of stocks that range from 8 to 12 metric tons of CO_2/year, which can easily compete with any other forestry or agroforestry system at substantially lower costs.

2.3 Problem and solutions trees

The main problem encountered by the project is the lack of opportunities for the implementation of sustainable land use activities, which is a recurrent situation in the three natural areas of the country (Coast, Highlands and Tropical Forests). The other problem is the limited information available and the lack of promotion of forest projects along the coastal areas, with the exception of the northern coastal area where the project on “Reforestation with *Prosopis juliflora* in the Dry Forest” has provided very important lessons and experiences.

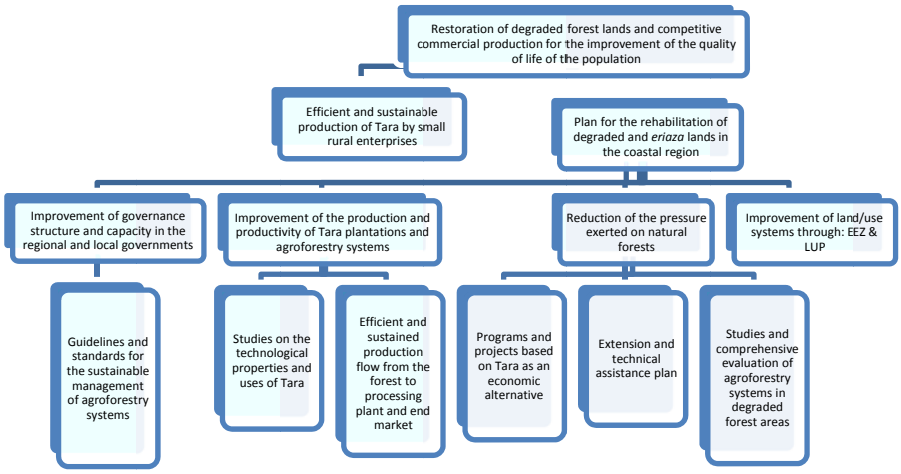
This situation, caused by the lack of opportunities or alternatives and the misuse of lands, has very serious consequences for the degradation of forests and lands with forestry potential along the Coastal Areas and Tropical Forest Areas of Peru. As shown by the outcomes of project PD 583/10 Rev.1, regarding a reforestation plan with *Caesalpinea spinosa*, new possibilities are open for the implementation of an important program aimed at the rehabilitation of degraded lands in the Peruvian coastal region.

Problem Tree



The solution to the problem of the degradation of forests and forest lands is based on the formulation of an appropriate land zoning and management system and on the identification of alternative economic activities that can compete with the land-use changes that destroy or degrade forest lands. This must be accompanied by a program for the information and dissemination of these alternatives so as to provide training opportunities to the target populations interested in participating in a forest land rehabilitation program.

Solutions Tree



2.4 Logical Framework

PROJECT COMPONENTS	INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
DEVELOPMENT OBJECTIVE: Develop guidelines for SFM and rehabilitation of degraded and *eriaza* lands in the Peruvian coastal region as a strategy for climate change mitigation and improvement of the living standards of the rural population.	Adoption of reforestation and agroforestry systems as part of a national program for the rehabilitation of *eriaza* lands and climate change mitigation in the coastal region of Peru	Technical report and results of meetings /workshop to establish the basis for a national reforestation and agroforestry program for the Peruvian coastal region	The National Forest Authority maintains and reaffirms its political decision to implement a national program for the rehabilitation of degraded areas and climate change mitigation in the coastal region
SPECIFIC OBJECTIVE: Design and development of guidelines for the sustainable management of Tara plantations in the Peruvian coastal region.	Guidelines developed and validated for the rehabilitation of degraded lands and management of plantations and agroforestry systems adapted to the Peruvian coast conditions	Technical reports and approved legal provisions	Participation of specialists, government representatives and civil society in a joint work effort
OUTPUT 1 Establishment of high productivity 30-ha module in agroforestry systems associated with Tara *(Caesalpinea spinosa*) plantations	A high productivity pilot module is implemented over 30 hectares for the rehabilitation of degraded lands and climate change mitigation	Report on operational module including economic, ecological and social viability. Module under implementation over 30 ha	Favourable economic, logistic and technical conditions for the development of a pilot module
OUTPUT 2 Development of technological package that may be replicated in other regions of the Peruvian coast	A technological package is developed and validated for Tara-based reforestation and agroforestry systems in arid and semi-arid areas of the Peruvian coast	Technological package validated and approved Modular system designed for replication at the coastal region level	Possibility of implementing activities as planned and availability of human and financial resources
OUTPUT 3 Development of guidelines for the sustainable management of Tara plantations and the rehabilitation of degraded *eriaza* lands	Guidelines developed and validated for the sustainable management of forest plantations and agroforestry systems and the rehabilitation of degraded lands in the Peruvian coastal region	Results of review and validation workshops Provisions issued by forest authorities	Political will of national forest authorities and regional governments

2.5 Objectives

2.5.1 Development objective

Develop a national program for the rehabilitation of degraded and *eriaza* lands in the Peruvian coastal region as a strategy for climate change mitigation and improvement of the living standards of the rural population of the region.

Impact indicators:

In compliance with this objective and drawing on the lessons learned through project PD 583/10 Rev.1 (F), the project will establish the technical and policy basis for the development of a national program for the rehabilitation of degraded and *eriaza* areas in the coastal region of Peru.

2.5.2 Specific objective

Develop a replicable technological package and guidelines for the sustainable management of Tara plantations in the Peruvian coastal region.

Impact indicator:

The expected impact after the achievement of this objective is to contribute to the improvement of the living standards of the rural population in the Department of Arequipa and, in the longer term, of the rural population in the entire coastal area of Peru, through the use of advanced techniques for the sustainable growing of Tara and, in particular, the rehabilitation of a large area of degraded lands that used to be harvested by Inca and Pre-Inca communities for high-productivity agricultural activities in the so-called “lomas”, which are formations dependent on atmospheric associations that are now disappearing due to the degradation caused by over-logging and over-grazing.

PART III. ACTIVITIES, INPUTS AND COSTS

3.1 Expected outputs and scheduled activities:

Output 1.1 Establishment of high productivity 30-ha module in agroforestry systems associated with Tara *(Caesalpinea spinosa*) plantations.

1.1.1 Evaluation and selection of plots (up to 30 ha)
1.1.2 Detailed inventory
1.1.3 Establishment of permanent sample plots
1.1.4 Design of management of Tara plantations
1.1.5 Implementation of irrigation system with underground water
1.1.6 Silvicultural tending and harvesting
1.1.7 Economic analysis of the whole system

Output 1.2 Development of technological package that may be replicated in other coastal regions of the Peruvian coast

1.2.1 Systematization of technical and socioeconomic information
1.2.2 Technical and economic analysis
1.2.3 Development of technical manuals
1.2.4 Training and dissemination of results

Output 1.3 Development of guidelines for the sustainable management of Tara plantations

1.3.1 Development of outline for guidelines
1.3.2 Workshop to define the basis for the guidelines
1.3.3 Development of draft guidelines
1.3.4 National validation of guidelines
1.3.5 Publication and dissemination of guidelines

3.2 Approaches and methods

The project should be carried out taking into consideration the guidelines, manuals, objectives and priorities established by the General Forest and Wildlife Directorate of MINAG as well as the ITTO guidelines for the rehabilitation of degraded forest lands and secondary forests. Special care will be taken to incorporate in the project document the main elements of ITTO objectives, Objective 2000, and the principles and objectives set out in the ITTA 2006.

The project approach will be based on the work methods traditionally used for this type of activities, under the responsibility of a general project coordinator with the participation of national consultants and national staff and including, in particular, contacts, relationships and consultations with the representatives o members of key stakeholder groups, including small and medium producers, associations and communities, small enterprises, national, regional and local authorities, who should all be adequately informed and consulted on an ongoing basis regarding expected outcomes and objectives but especially on their participation and responsibilities.

An important part of the work strategy will be the consultation and advice of the different project stakeholders and beneficiaries through participatory methods, organization of talks, technical meetings and workshops. In the technological field, the project is expected to carry out a process of evaluation and monitoring of the module, as well as the systematization of the information and lessons derived from project PD 583/10 Rev.1 (F).

3.3 Schedule of activities

SCHEDULED ACTIVITIES	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Responsible Party
PRELIMINARY ACTIVITIES																									Coordinator
Output 1.1 Establishment of high productivity 30-ha module in agroforestry systems associated with Tara *(Caesalpinea spinosa*) plantations																									Coordinator
1.1.1 Evaluation and selection of plots (up to 30 ha)																									FM Specialist
1.1.2 Detailed inventory																									FM Specialist
1.1.3 Establishment of permanent sample plots																									FM Specialist
1.1.4 Design of management and agroforestry systems																									Coordinator
1.1.5 Implementation of irrigation system with underground water																									Coordinator Sub-contract
1.1.6 Silvicultural tending and harvesting																									Forest management specialist
Output 1.2 Development of technological package that may be replicated in other regions of the Peruvian coast																									Coordinator
1.2.1 Systematization of technical and socioeconomic information																									Coordinator
1.2.2 Technical and economic analysis																									Coordinator
1.2.3 Development of technical manuals																									Coordinator
1.2.4 Training and dissemination of results																									Coordinator
Output 1.3 Development of guidelines for the sustainable management of Tara plantations																									Coordinator
1.3.1 Development of outline for guidelines																									Management Specialist - Coordinator
1.3.2 Workshop to define the basis for the guidelines																									Coordinator - FM Specialist
1.3.3 Development of draft guidelines																									Coordinator - FM Specialist
1.3.4 National validation of guidelines																									Coordinator
1.3.5 Publication and dissemination of guidelines																									Coordinator

3.4 Total consolidated budget

		QUANTITY					YEARLY BUDGET		TOTAL
CODE	BUDGET COMPONENT	Year 1	Year 2	Total	Unit	Unit Cost	Year 1	Year 2	
11.1	Project Coordinator	12	12	24	month	2,000.00	24,000.00	24,000.00	48,000.00
11.2	Administrator	12	12	24	month	400.00	4,800.00	4,800.00	9,600.00
11.4	SFM specialist (part time)	10	10	20	month	1,000.00	10,000.00	10,000.00	20,000.00
12.1	Technical assistants, fieldwork leader	20	20	40	month	600.00	12,900.00	11,100.00	24,000.00
12.2	Skilled workers	800	712	1512	day	25.00	19,400.00	18,400.00	37,800.00
13.2	Consultant 1: Extension and outreach			1	month	3,000.00	-	3,000.00	3,000.00
13.7	Consultant 2: Forest economics, business		0	-	month	6,000.00	6,000.00	-	6,000.00
15.2	Workshop 1: Tara production and management	1		1	course	12,000.00	12,000.00	-	12,000.00
22.1	Sub-contract, artesian wells for underground water		0	-	well	5,000.00	-	5,000.00	5,000.00
15.3	Workshop 2: SFM guidelines for Tara plantations	24	24	48	workshop	100.00	2,400.00	2,400.00	4,800.00
31.1	DSA /national specialists - consultants	4	2	6	day	250.00	1,000.00	500.00	1,500.00
33.1	Local travel – air fares	12	12	24	air fare	100.00	1,200.00	1,200.00	2,400.00
33.2	Local travel – land fares			1	land fare	3,000.00	-	3,000.00	3,000.00
42.1	Site for high-productivity module	30	0	30	hectare	2,000.00	60,000.00	-	60,000.00
44.1	Computer equipment Set: PC, printer/scanner	1		1	-	2,500.00	2,500.00	-	2,500.00
44.2	Forestry equipment, GPS, forest inventory	1	0		-	1,800.00	1,800.00	-	1,800.00
44.3	Equipment and materials for technical irrigation system	1	0	1	module	40,000.00	40,000.00	-	40,000.00
51.0	Raw materials – Fertilizers, pesticides	15	15	30	MT	200.00	3,000.00	3,000.00	6,000.00
54.0	Office supplies	3	5	8	-	500.00	1,500.00	2,500.00	4,000.00
60.0	Miscellaneous, auditing, insurance	1	1	2		2,300.00	2,300.00	2,300.00	4,600.00
100	TOTAL OPERATING COSTS						204,800.00	88,200.00	293,000.00
	ITTO Monitoring & Review (US$6,000/year)						5,500.00	5,500.00	11,000.00
	ITTO Programme Support Costs (12% of ITTO budget)								16,032.00
	Executing Agency Management Costs								43,950.00
	TOTAL PROJECT COST								364,942.00

3.5 Budget by financing source

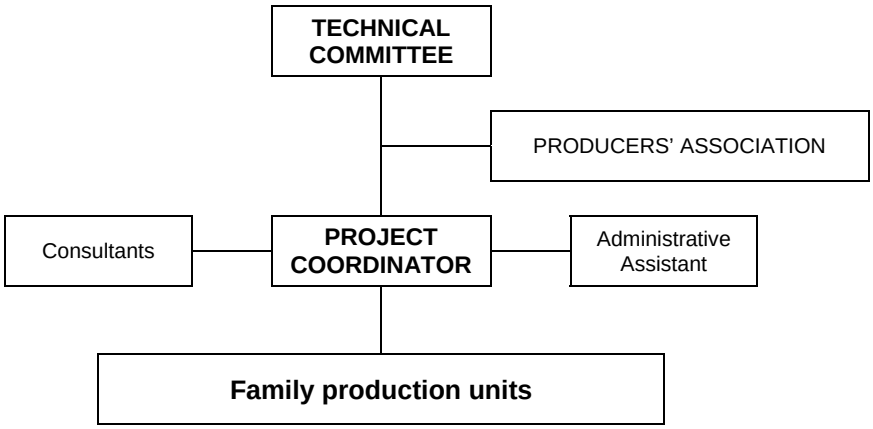
		ITTO BUDGET			EXECUTING AGENCY BUDGET		
CODE	BUDGET COMPONENT	Year 1	Year 2	Total	Year 1	Year 2	Total
11.1	Project Coordinator				24,000.00	24,000.00	48,000.00
11.2	Administrator	4,800.00	4,800.00	9,600.00			0.00
11.4	SFM specialist (part time)	10,000.00	10,000.00	20,000.00			0.00
12.1	Technical assistants, fieldwork leader	7,200.00	7,200.00	14,400.00	5,700.00	3,600.00	9,300.00
12.2	Skilled workers	5,000.00	4,000.00	9,000.00	14,400.00	14,400.00	28,800.00
13.7	Consultant 2: Forest economics, business	0	3,000.00	3,000.00	-	-	-
15.2	Workshop 1: Tara production and management	6,000.00	-	6,000.00	-	-	-
22.1	Sub-contract, 2 artesian wells	12,000.00	0	12,000.00	-	-	-
15.3	Workshop 2: SFM guidelines for Tara plantations	0	5000	5,000.00	-	-	-
31.1	DSA /national specialists - consultants	2,400.00	2,400.00	4,800.00	-	-	-
33.1	Local travel – air fares	1,000.00	500.00	1,500.00	-	-	-
33.2	Local travel – land fares	1200	1,200.00	2,400.00	-	-	-
42.1	Site for high-productivity module	0	0	0.00	60,000.00		60,000.00
44.1	Computer equipment Set: PC, printer/scanner	2,500.00	0	2,500.00	0	0	0
44.2	Forestry equipment, GPS, forest inventory	1,800.00		1,800.00	0	0	-
44.3	Equipment and materials for technical irrigation system	20,000.00		20,000.00	20,000.00		20,000.00
51.0	Raw materials – Fertilizers, pesticides	3,000.00	3,000.00	6,000.00	0	0	-
54.0	Office supplies			0.00	1,500.00	2,500.00	4,000.00
60.0	Miscellaneous, auditing, insurance	2,300.00	2,300.00	4,600.00			
100	TOTAL OPERATING COSTS	79,200.00	43,400.00	122,600.00	125,600.00	44,500.00	170,100.00
	Mid-term and final evaluations (US$6,000/year)			11,000.00			
	ITTO monitoring and administration costs (12% of operating costs)			16,032.00			
	Executing Agency Management Costs						45,210.00
	TOTAL PROJECT COST			149,632.00			215,310.00

PART IV. IMPLEMENTATION ARRANGEMENTS

4.1 Executing agency and organizational structure

The project executing agency will be the Association for Agro-Industrial Development in Camana (*Asociación Pro Desarrollo Agroindustrial de Camana* – APAIC).

APAIC is a non-profit organization that is open to all interested stakeholders. Its membership currently comprises more than 50 small farmers.



Technical Committee

The project steering committee will be the highest authority in the project policy and administration structure and will be made up of one representative from ITTO, a MINAG representative and a representative of the executing agency (APAIC). The committee will meet twice – once to assess project progress and provide guidance to improve project execution and a second time at the end of the project. The technical committee will be the highest authority in the technical execution of the project and it will be responsible for supervising, evaluating, proposing improvements or solutions, and making decisions on project implementation. This committee will also be in charge of preparing all technical and financial reports, managing project personnel, and other duties or activities as required.

4.2 Project management

Project management will be under the responsibility of the Project Coordinator, who will work together with an administrative assistant in accounting procedures and personnel administration. In addition, the project will have the support of a part-time forest management and agroforestry specialist (8 days per month) and a permanent fieldwork leader.

The Project Coordinator will be responsible for coordinating all technical and administrative aspects of the project.

The Administrative Assistant will be in charge of project accounting, preparation of cash-flow reports and financial statements, and other documents as required.

The producers' association will participate in the consultations, organization of events, discussions, and information dissemination activities.

The family units comprise small producers' households that will be the project beneficiaries and will participate in the interviews and in consultation and dissemination activities.

The representatives of key stakeholders, including associated small producers, individuals and families, will be consulted throughout the project development process. Similarly, community leaders and local government authorities will also participate in information and consultation activities.

4.3 Reporting, monitoring and evaluation

Project progress and completion reports

At the beginning of the project, the Coordinator will prepare an inception report to be submitted to ITTO and the Technical Committee, and will also submit a detailed progress report and financial statement within four months of project start-up. These reports will be submitted every four months in accordance with ITTO's regulations for project formulation and implementation. A project completion report including the final document will be submitted at the end of the 24-month implementation period.

4.4 Risks

The project as a whole does not pose any significant risks from a social, economic or environmental viewpoint. On the contrary, an initiative such as this will open the door to important alternatives for the rehabilitation of very degraded ecosystems, which would otherwise be irreversibly lost. In this sense, the project can only provide multiple benefits.

However, a potential risk could be a sharp drop in the market price of Tara products both at the national and international levels. But even in this hypothetical case – and taking into account the high and increasing unmet demand for these products at the world level – natural and processed Tara products are not perishable and could be stored for a long time until prices increase.

Another possible risk could be the effects of climate change, including extreme temperatures and droughts. However, Tara is a very strong crop that can withstand extreme site and climate conditions.

4.5 Sustainability

Project sustainability is guaranteed by the fact that the direct beneficiaries are in charge of maintaining the demonstration plots and therefore future operational costs will be under their responsibility. This has been made possible because over the last few years, the members have invested significant funds in the establishment and maintenance of their plots.

Furthermore, the project outputs i.e. the technological package and the SFM and land rehabilitation guidelines will be policy tools ready to be applied in the field, although they may be subject to future revisions and/or improvements to keep them up to date. Thus, the full model to be developed will be kept current, which will ensure project sustainability. All of this is based on the assumption that subsequent government administrations will continue to give the same or even more importance and political support to the rehabilitation of degraded lands and reforestation in the coastal region of Peru.

Sustainability mechanism

- Curbing of the expansion of the agricultural frontier and hence deforestation
- Development of new sustainable development alternatives
- Generation of employment based on gender-equality criteria, and poverty alleviation
- Reduction of migration to urban areas
- Socioeconomic development of rural areas

4.6 Dissemination and mainstreaming of project learning

The project will use different means for the dissemination and mainstreaming of achievements and lessons learned, including the following:

i) Work meetings and workshops, with the participation of direct project stakeholders and beneficiaries but also other invited guests such as local governments, NGOs, official agencies, universities, etc.
ii) Printed outreach documents prepared in accordance with the training plan and technical brochures on specific topics, which will be widely distributed throughout the micro region and other adjacent and neighbouring areas.
iii) Conferences and work meetings at different levels.
iv) The project consultative committee.
v) Participation in information-sharing meetings with small farmers from other micro regions.

ANNEX 1 – PROFILE OF THE EXECUTING AGENCY

The project executing agency is the Association for Agro-Industrial Development in Camana – APAIC (Asociación Pro-desarrollo Agroindustrial de Camana), which is an association grouping small farmers from this province on the south coast of Peru with a view to promoting agroforestry activities to ensure better land utilization and rehabilitation of degraded or *eriazo* ecosystems through agricultural and/or forestry systems that represent economic alternatives of special significance and impact on the environment and the rural economy.

In its seven years of existence, APAIC has developed a number of initiatives based on agroforestry systems that may be adapted to extreme arid conditions and soils with high salt content. Thus, it has established small experimental plantations of *Casuarina esquesitifolia, Eucalyptus camaldulensis* and more recently *Caesalpinea spinosa*, a species that has shown better and even surprising results even though the seeds used were from the South Andean region of Peru (Ayacucho).

The surprising success achieved in a pilot plot of approximately 4 hectares has raised a high degree of interest among APAIC members as well as the entire province and the local government. However, it will be necessary to establish a plantation with a sufficient area and production capacity to develop industrial processing systems for value-added production and development of a whole production and value chain.

APAIC is a non-profit organization that is open to all interested stakeholders. Its membership currently comprises more than 50 small farmers with plots of up to 15 ha, amounting to a total area of 500 ha on totally degraded lands. The Association has an executive board or board of directors, with a chairperson, a secretary, a treasurer, a promotion officer and a monitoring officer. It is headquartered in the city of Camaná and has been officially recognized and endorsed by the local government and the Ministry of Agriculture (MINAG).

APAIC has developed an outreach and training program on arid land management systems. To this end, it has organized conferences, short courses and field demonstration activities in coordination with the local government (municipality) of Camaná.

In 2008, APAIC signed an agreement with the AGRORURAL Programme of the Ministry of Agriculture for the installation of two 10-ha demonstration modules with Tara plantations in the Province of Camaná with a budget of US$60,000. To date, its members have invested around US$250,000 over a total of approximately 100 hectares including Tara and olive plantations of 2 to 6 years of age. APAIC was also the executing agency of Project PD 583/10 Rev.1 (F), which has just been completed (2011-2013) and has given rise to this new project proposal.

ANNEX 2 – TASKS AND RESPONSIBILITIES OF KEY STAFF

A. PROVIDED BY THE EXECUTING AGENCY

The Executing Agency will make the following human resources available to the project:

- PROJECT COORDINATOR
  Duration: 24 months

Duties: General technical and administrative management and coordination of the project; responsible for budget execution; secretary of the Project Steering Committee; preparation of inception, six-monthly and completion reports.

- SKILLED WORKERS

The Executing Agency will provide manpower for the implementation of the project's field activities as well as the manpower required for the establishment of reforestation and agroforestry plots, including their maintenance, evaluation, etc.

B. PROVIDED BY ITTO

- ADMINISTRATIVE ASSISTANT
  Duration: 24 months

Duties: Responsible for the administration and accounting of project funds; preparation of monthly and six-monthly financial reports.

Qualifications: Accountant or administrative technician with experience in the management of project budgets and accounts.

2-3 years work experience

Good command of Excel and online software management

- FOREST MANAGEMENT AND AGROFORESTRY SPECIALIST
  Duration: 24 months, part-time

Duties: Ongoing technical assistance in integrated Tara plantation management and agroforestry activities, including associated crops, and development of inventory and management plan for Tara forest plantations, harvesting outputs and marketing of products.

Qualifications: Forest engineer with field experience in the management of forest plantations in the coastal region and management of agroforestry systems.

A minimum of 5 years professional experience

Availability to work in the project for 8 days per month during the project implementation period.

- ECONOMICS AND BUSINESS DEVELOPMENT CONSULTANT
  Duration: 1 month

Duties: Technical assistance in marketing and development of small enterprises to be integrated into the production chain; assessment of the economic efficiency of the forest and agroforestry module; and establishment of a cost structure for the module to be included in the technological package.

Qualifications: Agrarian or forest economist.

5 years professional experience

BUDGET ITEMS: SUB-CONTRACTS AND EQUIPMENT

- SUB-CONTRACTS

Digging and installation of artesian well approx. 60 meters deep for the pumping of irrigation water to the high-productivity module plots.

- EQUIPMENT AND MATERIALS FOR TECHNOLOGICAL IRRIGATION SYSTEM

Submersible pumps, discharge pumps, filters, pipes, drip heads, drip irrigation hoses.

46th EXPERT PANEL'S COMMENTS

A) Overall Assessment

The panel noted the importance of this Small Project proposal aimed at developing guidelines for SFM and the rehabilitation of degraded and marginal lands in the Peruvian coastal region as a strategy for climate change mitigation and improvement of the living standards of the rural population. As such, the proposal is highly relevant to ITTO's objectives and priorities. The Panel also noted that the proposal fully followed the format described for Small Projects in the ITTO Manual on Project Formulation. Moreover, the Panel further observed that this Small Project proposal originates as an outcome of the completion of a prior ITTO pre-project in that same region, namely project PD 583/10 Rev.1 (F) "Restoring Sub-Humid Ecosystems in Southern Peru through Reforestation with Tara - *Caesalpinea spinosa*", which has proven to be highly beneficial from an environmental and socioeconomic viewpoint after reforesting waste land areas that previously had no economic or environmental value with Tara trees. However, it also observed that the proposal was lacking background baseline information, particularly as regards the main outcomes of PD 583/10 Rev.1 (F), which resulted in the formulation of this proposal. Moreover, the Panel further considered it would be premature to develop additional guidelines for agroforestry systems, as currently minimal research had been carried out as regards agroforestry systems with Tara in that region.

B) Specific Recommendations

The proposal should be revised taking into account the overall assessment **and** the following:

1. Consider focusing solely on the development of guidelines for the sustainable management of Tara Plantations, as more time and research would be required to develop guidelines for the associated agroforestry systems;

2. Reassess the output 3 in line with the previous recommendation and include SMART qualitative and quantitative indicators and means of verification in the logical framework matrix;

3. Adjust the costs for ITTO monitoring and review to US$6,000 per year, eliminate the cost included for ex-post evaluation as it is not required for Small Project proposals, but add ITTO's Programme Support Costs so as to conform to the new standard of 12% of total ITTO project costs; and

4. Include an Annex which shows the overall assessment and recommendations of the 46th Panel and the respective modifications in tabular form. Modifications should also be highlighted **(bold and underline)** in the text.

C) Conclusion:

Category 1: The Panel concluded that the proposal could be commended to the Committee with incorporation of amendments.

RESPONSE TO THE EXPERT PANEL'S RECOMMENDATIONS

All the comments and recommendations made by the 46th Expert Panel have been addressed in the proposal:

1. A special item (1.4) has been included on page 6 of the document with a description of the bio-physical and social baseline for the project.

2. The document has been revised and its objectives and outputs have been narrowed down to focus on the development of guidelines for Tara plantations.

3. ITTO monitoring and programme support costs have been adjusted in the budget as requested. These adjustments have been included in the budget tables shown on pages 16-17 of the project document. These budget adjustments included the allocation of US$6,000/year for monitoring and review costs and 12% of the ITTO budget for Programme Support Costs. Corresponding adjustments have been made in other budget components so as not to alter the original budget totals; thus, the revised ITTO budget now amounts to US$149,132.00 as compared to the original total of US$149,373.00, while the executing agency's budget now amounts to US$215,310.00 as compared to the original total of US$215,500.00. Therefore, the overall budget total now amounts to US$364,622.00 as compared to the original overall total of US$364,873.00.