

**REHABILITATION OF DEGRADED FOREST USING INDIGENOUS SPECIES
THROUGH LOCAL COMMUNITY EMPOWERMENT
IN WEST KALIMANTAN, INDONESIA**

Technical Report No. 5

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ABSTRACT

This Technical report is made available to satisfy the specific objective 2, output 2.2. activity 2.2.2 on developing a comprehensive project proposal with detailed specification of all inputs and activities and fully budgeted by component, activity and source.

Draft of Project Proposal Title :

**REHABILITATION OF DEGRADED FOREST USING INDIGENOUS SPECIES
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SUMMARY

The Aim of the development of project proposal document is to implement the completed pre-project in improving and protecting the tropical forest in Indonesia especially in West Kalimantan Province from the continuing degradation. The decline and degradation of the forest must be arrested through several activities, therefore the specific objectives of the project consist of : (I) to determine the underlying process of recovery on the degraded forest areas; (ii) to establish in collaboration with local community demonstration plantation for rehabilitation and protection of degraded forests through enrichment planting, block planting and build the capacities of local community in farming or agroforestry plantation establishment.

This project seeks to define the perception of local communities on forest degradation and methods for establishing plantation using selected indigenous species for rehabilitating degraded tropical forest in Indonesia. The project is also aimed to strengthen the technical capacity of local human resources through the establishment of a service and training unit for the demonstration forest plantation and agroforestry establishment as buffer zone.

Field of the project is Reforestation and forest management-Social forestry proposed by Kapuas Watershed Management Agency (Technical Unit of Directorate General of Land and Social Forestry of the Ministry of Forestry) as Executing Agency, in collaboration with Faculty of Forestry Tanjungpura University West Kalimantan, Indonesia as Implementing Agency. The total budget proposed is US \$ 907,616.-, consisting of ITTO source of finance US \$ 696,540.- and Government of Indonesia US \$ 211,076,-

INTRODUCTION

1. Original

The proposed Project Document is derived from pre-project PPD 103/04 Rev.2 (F). The proposed rehabilitation project are totally at 6 (six) location within the Kapuas watershed of West Kalimantan, representing upstream (site 1 and 2), middle stream (site 3 and 4) and downstream (site 5 and 6). The preliminary study as baseline data collection was conducted to include the cause of forest degradation, socio-economic condition, as well as consultation and socialization about reforestation of degraded forest using indigenous species. The results of PPD 1003/04. Rev 2 (F) is drawn in the following paragraph.

1. The six sites are site 1: Mentajoi (District of Sintang), Site 2: Merbang (District of Sekadau), Site 3: Lintang Pelaman (District of Sanggau), Site 4: Empirang Ujung (District of Sanggau), Site 5: Manggang (District of Landak), and Site 6: Bunbun (District of Pontianak).
2. The project areas are underlain by quartz, lithic and conglomerate materials with intrusive and plutonic rocks of Hasimen formation. In moderately steep terrain to flat, these rocks are frequently covered by thick mantle of highly weathered material. The soils are of udult type and belong to the family group of the Ultisol. They are soils in warm humid region with argillic horizon and low base saturation, associated in the lower terrain with alluvial, histosol and usually podsol.
3. The main cause of the forest degradation in the site study is mostly due to illegal logging, forest fires, and forest conversion primarily to oil palm plantation. The remaining forest is managed local community through "tembawang" system (traditional Forest-Fruit Trees system).
4. Principally the villagers demand that their living ecosystem and environment must be restored and their forest are rehabilitated. For all proposed sites of forest rehabilitation project, tree species will be planted depending on the species preferred in each location among others are: gaharu (*Aquilaria malacensis*); tengkawang (*Shorea stenoptera*, *S. pinanga* etc); ulin/belian (*Euxideroxylon zwaery*); meranti (*Shorea sp*); kapur (*Hopea sp*); bengkirai (*Shorea sp*), jelutung (*Dyera costulata*); damar (*Agathis damara*); durian (*Durio zibethinus*), kelampai (*Elateriospermum tapos*), keranji (*Dialium sp.*) as well as the introduced species

such as kemiri (*Aleuritus molluccana*) and rubber (*Hevea braziliensis*) as buffer for the ecological and economical reasons.

5. The community welcomes for the rehabilitation of degraded forest using indigenous species in each site, if it will benefit for them. Therefore, they identified and committed to develop the demonstration plots in each site, those are Site 1 (60ha), Site 2 (50 ha), Site 3 (70 ha), Site 4 (60 ha), Site 5 (50 ha), and Site 6 (80 ha) using enrichment planting system in degraded forest and block planting system in bare soils with mostly dominated by alang-alang grasses (*Imperata cylindrica*).

With regard to those results, it is important to develop a demonstration plots in rehabilitating the degraded forest using indigenous species, the species in which will be functioned as source of livelihood especially from non-wood products, genetic conservation and ecological improvement. The involvement of local community will strengthen the program on rehabilitation of degraded forest.

Even though it is understood that up to the present the interdependency between local communities and forest is very high, not only in economical but also socio-cultural ways. Also scientific understanding on the impact of degradation on ecosystem as well as the processes of recovery after degradation is very limited to be adopted. Therefore, scientific approach on recovery process of degraded forest is still needed to be studied.

The benefit of this proposed project would strengthen the government effort on National Movement on Land and Forest Rehabilitation in increasing and securing the forest productivity, timber production, resource security, socio-economic benefit as well as ecological improvement.

2. Sectoral Policies

This proposal is relevant to the 5 priority programs of the Ministry of Forestry, the Republic of Indonesia, that was declared in 2001, those are: (1) To combat the illegal logging, (2) To intensify industrial forest plantation development, (3) To prevent and mitigate forest fires, (4) empowerment of local communities in rehabilitation of degraded forest and protection of water catchments, and (5) To speed up the decentralization process of forest management.

Establishment of demonstration plots in 6 sites will contribute significantly to the effort of the Government of Indonesia in rehabilitating the degraded forest and in empowering the local community.

Among the proposed indigenous species by the local community (*Aquilaria malaccensis* belongs to Appendix II of CITES. The species of *Dyera costulata*, *Euxyderoxylon zwageri* and *Shorea stenoptera* is also protected by the Decree of Ministry of Forestry (1990) due to its role for poverty alleviation of the community surrounding the forest. Indirectly the program will contribute significantly to the conservation of indigenous species.

3. Programmes and Operational Activities

The project will be located in six (6) selected areas representing the up stream, middle stream and down stream of Kapuas watershed and representing different type of forest degradation, different socio-economic and culture systems, different choice of indigenous species, different soil type and conditions, and different existing vegetation cover.

Prior to the planting, the nursery will be established in village nearby the planting site for being able to train the local community in propagating the selected species of each respective village.

Good quality of seedlings in good size and in sufficient number will be planted using strip line planting system for degraded forest and block planting system for bare land dominated by along-alang grass. Local agroforestry system (Tembawang) will also be considered to enrich the planting system. Local community will do land preparation with the technical guidance from the team. Site species matching will also be studied in all selected sites.

Technical assistance will also be given to the community who would like to develop their own land (outside of Demonstration plots) to be forested as one of the strategies to achieve the project beneficiaries and sustainability. Cooperation with NGO for forest rehabilitation campaign will be done to strengthen the program. Therefore, the local community has to prevent the demonstration plot from forest fire.

Monitoring and evaluation of demonstration plot will be done for three years hand in hand with Kapuas Watershed Management Agency (BP DAS Kapuas) to

strengthen their program on National Movement for Land and Forest Rehabilitation Program.

The Project Executing Agency will be Kapuas Watershed Management Agency (BP DAS Kapuas) of the Ministry of Forestry, in cooperation with the Faculty of Forestry Tanjungpura University as Project Implementing Agency.

OBJECTIVE

1. Development Objective

To secure the continuity of timber production using indigenous species with regards to the empowerment of the local community in developing the demonstration plantation in degraded forest areas.

2. Specific objectives

- 1.2.1. To determine of recovery process for rehabilitating the degraded forest ecosystem using indigenous species.
- 1.2.2. To establish demonstration plantations for rehabilitation of degraded forests through capacity building of local communities.

METHODOLOGY

The highly percentage of degraded forest in West Kalimantan has to be rehabilitated with a special project. The proper methods applied primarily through local community empowerment, in other words, the project must recognize local community participation in all stages of forest and tree resource management.

Trees to be used in the rehabilitation project will be indigenous species which ecologically improves biological diversity of the forest and provide natural resource management options for local communities. The reforestation project is therefore not a product of a top-down program, it will evolve from farmer's need and deliberate choices of what to plant such as rubber, a traditional commercial tree species, for shorter economic benefits.

In the rehabilitation project methods of planting on cleared forest land will be block planting, whereas in the degraded residual forest will be applied enrichment planting.

FINDING

1. Project Justification - Problems to be addressed

Sustainable management of forest resources of Indonesia is being hampered due to the escalation of uncontrolled logging, forest fire and other forestland conversion.

The impacts of the forest degradation on the communities, who depend on the forest, have also not been determined. Also very little effort has been made in the rehabilitation of degraded forest, the unique forest ecosystem, in involving the local community. So far, the efforts on forest rehabilitation is being known through block planting with exotic and adaptive species in the scattered industrial plantation but it is very rare in degraded natural forest.

There are several methods applied in the forest rehabilitation, among others enrichment planting, Block planting and taungya systems. Enrichment planting is known as strip, gap or under-planting with indigenous species. In many cases, however this method seems to be not respected by common people due to not explicitly be seen and understood. Technically, this system gives advantage for species, which cannot grow on open area (shade tolerance) such as *Shorea stenoptera*, *Aquilaria sp.* Private company currently conducts Block Planting with exotic species (*Accacia mangium*, *Gmelina arborea*, *Eucalyptus sp*) as industrial plantation forest in totally degraded or cleared forest area. Another technique is the taungya system. However, a major pre-requisite for successful taungya is land hunger, which is generally practiced in Java, the very populated island of Indonesia. In the proposed project area such agroforestry model is practically done in small scale or in most cases grow with traditional rubber plantation.

Unfortunately local communities living near forests have not been seriously involved and empowered in rehabilitation programmes. Since community living near its own land and resources on it, there is the need to involve them for the success of rehabilitation program. Involvement of the local communities will not only lead to understanding of why and how they contribute to degradation but also what methods and species they perceive can be used to rehabilitate the degraded forests so that they can have maximum benefit. Involving them will also equip them with the capacity to undertake further rehabilitation programmes on their own lands and also motivate them to protect the rehabilitated forest.

An accurate evaluation of site conditions before reforestation and also scientific understanding of the recovery process after degradation must be implemented for the successful reforestation programmes. The evaluation of site conditions before planting will allow for the matching of appropriate species to site conditions and thus help to promote successful establishment of plantation. Scientific understanding of the process of recovery will allow for the development of management system that will be sustainable in terms of supply of both timber and non-timber forest product as well as in the conservation of biodiversity.

Therefore causes and key problems of degradation on ecosystem functions as well as their consequence after degradation is also urgent, as can be seen in the following tree problem (Fig. 1)

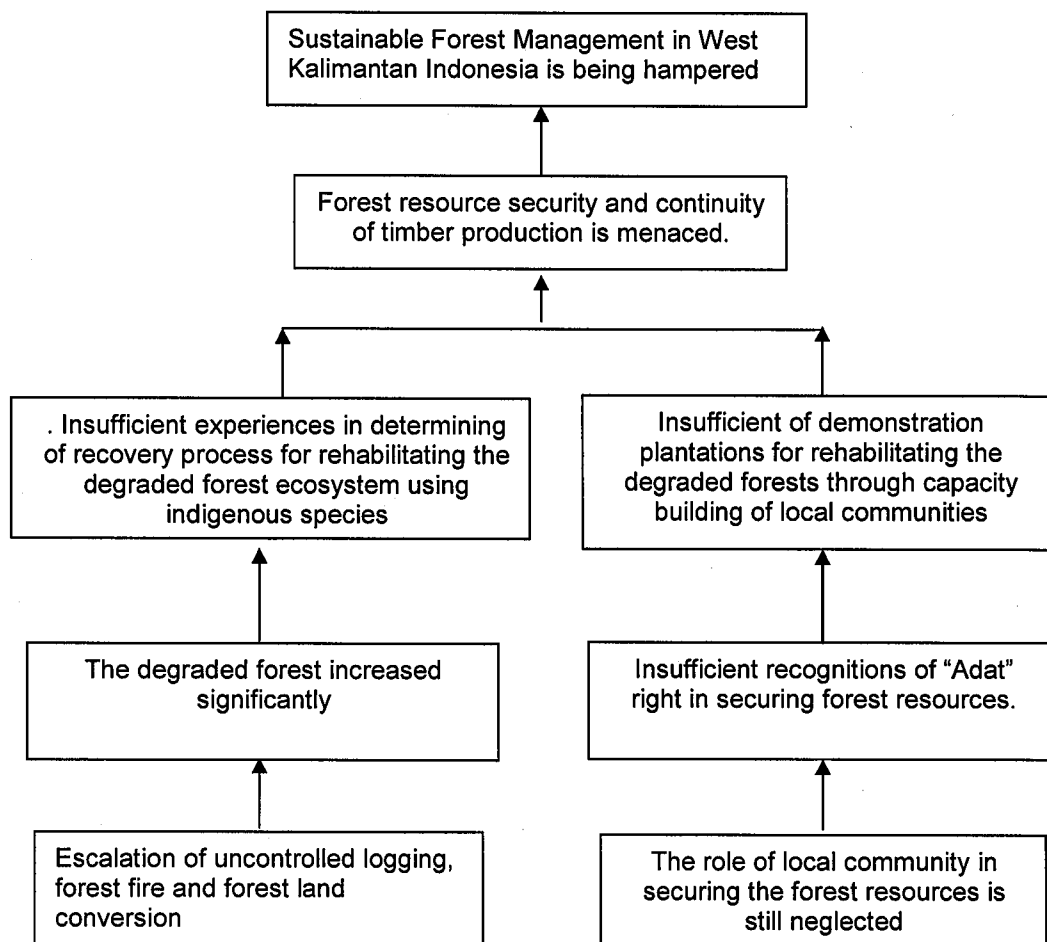


Figure 1: Problem Tree Analysis

ANALYSIS

1. Intended situation after project completion

Reforestation of degraded forest needs extraordinary efforts, especially when facing to marginal site conditions and low community empowerment. Rehabilitation of degraded forest in six (6) areas representing upstream, middle stream and down stream of Kapuas watershed will be good design in plot system representing the different type of degraded forest, different soil types, different species diversity, and different socio-economic condition.

After completion of this project, there will be some improvement in forest cover, availability of tree species, reduction of degraded forest, the local community empowerment. The establishment of tree cover as a result of the rehabilitation in demonstration plantation will promote the quality of environment and also increase the diversity of wildlife. The sale of non-wood products (tengkawang and durian fruits) from the rehabilitated areas will improve the income level of the local communities as well as the revenue to the state. It will also lead to improvement in other areas when the other communities apply the techniques learned by the local communities during the project execution. In the long-term, the forest resource security and continuity of timber production will be achieved as basic need of sustainable forest management in West Kalimantan Province.

When uncontrolled logging, forest fire and forest conversion decrease while the local communities in securing forest resources have recognized then the goal of this project can be analyzed from the following objective tree (Fig.2).

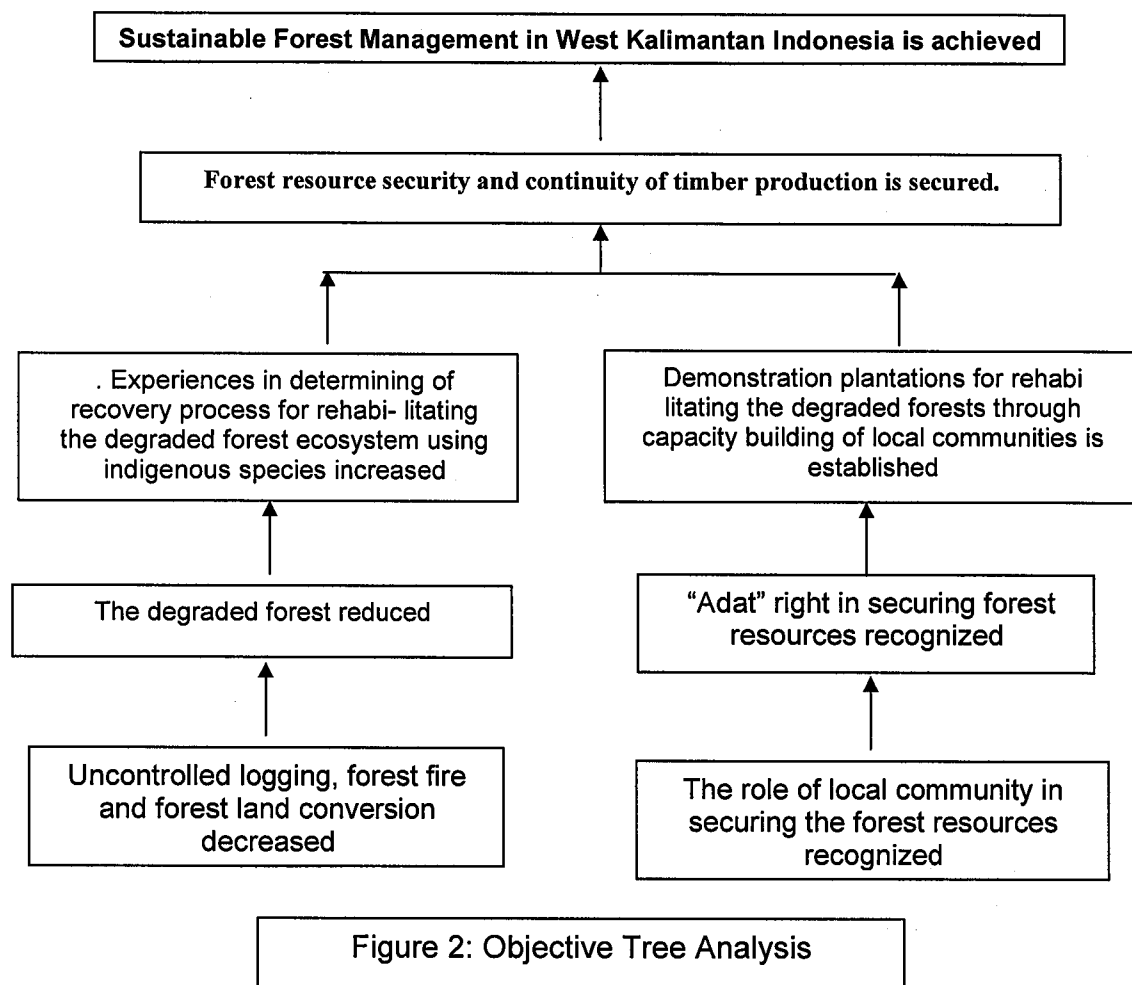


Figure 2: Objective Tree Analysis

2. Project strategy

Reasons for selection

This proposal has selected to promote plantation establishment in degraded forest areas using indigenous or adaptive species as against natural regeneration. The degraded areas are characterized by nutrient deficient soils, reduced primary productivity, and low biological diversity. Artificial regeneration therefore is the only solution; it grows fast and can rehabilitate the degraded areas within a relatively short period of time, primarily using adaptive species. On the other hand, natural regeneration, that it can only depend on mother tree, is however slow and cannot rehabilitate the areas within time scale compatible with short-term human needs.

Lesson drawn from past evaluation

In many cases approaches to land and vegetation rehabilitation depend on the severity of forest damage to the land resources, the goal of rehabilitation and the availability of resources for repairing the damage. The most intensive rehabilitation schemes are sometimes termed reclamation because the damage to sites is so severe that soils have to be replaced and the landscape may have to be reshaped before the vegetation can be re-established. Severely damaged areas due to clear cutting, forest fire or shifting cultivation are rehabilitated and replanted using adaptive (including fruit tree and exotic) species and/or indigenous species. In degraded sites, where vegetation is present but succession is arrested and does not progress towards the re-establishment of forest cover, less dramatic efforts have been done through enrichment planting such as strip planting and selective spot planting, using usually indigenous species.

It is believed that the first objective of degraded land rehabilitation is the prevention for further degradation. Tropical tree plantations can be an effective tool for arresting site degradation and a catalyst for vegetation rehabilitation.

Many studies have shown that tree plantation improve soil condition physically and chemically. The selection of planted species significantly affect these results since some species accumulate mass and nutrient more than others or they can influence the accumulation of a particular nutrient and not another. The manager has the option of matching species to site conditions and protecting the plantings.

In Indonesia especially outside of Java, restoration of degraded natural forests employs methods using mixtures of endemic species instead of planting monocultures, except for some industrial plantation forests using exotic fast growing species such as Acacia and Eucalyptus. Tree seedlings of indigenous species are raised in the nursery and planted out in degraded areas, usually in centerline of about one meter in width cut through the vegetation. Rates of establishment of some species are (mostly Dipterocarps) high. The drawback to this method of restoration is that the cost is relatively high because an input of labor is required at each stage of regeneration process from seed collection to raising seedling in the nursery, preparing sites, planting seedling and maintaining them afterwards. If abundant natural seedlings can be found in the area the level of human input could be reduced, cost will correspondingly be lowered and hence the area of forest restored per annum increased.

3. Target beneficiaries

The principal target beneficiary would be the Ministry of Forestry, Provincial Government of West Kalimantan and especially the local communities, which had been involved in the establishment of demonstration plantations. Private companies, other local communities and individuals who would like to establish plantation in degraded forests using the techniques developed in this project would also benefit. Other target beneficiaries would be the producer countries of the ITTO who would benefit from the technologies that would be developed. Consumer countries of the ITTO would also benefit if the result of this project were used to establish plantations on degraded forests in other tropical countries. Students and researchers are also invited for their research activities.

4. Technical and scientific aspects

Technically and scientifically, rehabilitation of degraded forest includes several approaches on ecological, silvicultural and socio-economic aspects.

Approach on ecological aspects consisted of soil properties study, climate assessment, and site-species matching trials. Ecological studies will be done to determine the impact of degradation on the ecosystem and primarily as well as to understand the processes of recovery after degradation. Soil properties (physical and chemical) of each site will be used to determine the soil amelioration efforts to provide better seedling growth. Biogeochemistry processes will be considered for being able to accelerate the optimum growth. Climate and soil properties assessment will strengthen the site-species matching trials.

Approach on silvicultural aspects consisted of choice of species, seed and seedlings technology, nursery technique, land preparation, planting system, tending, and growth measurement.

Silvicultural technique is crucial to establish the demonstration plantation of indigenous species. Choice of indigenous species will be based on the previous results in PPD 103/04 Rev.2 (F). Seed collection and germination will be done in each site based on species behaviors in order to have good quality of seedling in sufficient number. Some nursery techniques will be developed for seedling production and training purposes. Inoculation of mycorrhizal fungi will be done to promote the growth of seedlings.

Seedling will be planted at spacing of 3 x 3 m. The growth rates (diameter and height) of the planted materials will be measured from the sample plots in all planting methods. Natural regenerating seedling in the planted plots will be identified and the growth rate measured while in the control plot naturally regenerating seedling will be identified and the growth rate also measured. This will be made once every month. All regenerating seedling in both treatment and control plots taller 5 m would be identified, mapped and tagged. Basal diameter and total height of the seedling would also be recorded at three monthly and during these periods mortality would be noted while new recruits would be identified.

Approach on socio-economic aspects consisted of local community empowerment, awareness campaign, development of traditional agriculture system, and plantation management option. Socio – economic approach is needed because a Participatory Rapid Appraisal (PRA) technique will be used to bring out the perception of local communities to underlying causes of degradation and measure by which they can address species to be used to establish plantation to rehabilitate the degraded forests and appropriate methods for maintenance of degraded forest.

The PRA technique will also be used to elicit response of the selected local communities on: (i) underlying causes of deforestation and degradation of forest near the communities, (ii) impact of degradation on the forest ecosystem as well as on the livelihood on the members of the community, and (iii) appropriate measures to be taken that will be address the causes.

The PRA technique will again be used to determine: (i) Indigenous species to be used for the rehabilitation of degraded areas by local communities (ii) Appropriate methods to be used to establish, protect and maintain plantation in the degraded areas for the future use and function.

Local communities will be trained in: (i) production of planting materials (seedling and other propagated materials) of the species they would use to rehabilitate the degraded areas, (ii) site preparation for enrichment planting and, block planting, (iii) planting methods, (iv) methods for assessment of survival and monitoring of growth, and (v) methods for maintaining and protecting the planted areas.

At the end of the project, a workshop will be conducted to disseminate the scientific and technical findings.

5. Economic aspects

The economy of Indonesia is predominantly based on agricultural and industries. Over 90 percent of farmers in the surrounding forest outside of Java are practicing mainly rain-fed agriculture and using traditional extensive methods of cultivation. Recognizing the importance of agriculture in the socio-economic development process, the Government of Indonesia was estimated to have the target a total of agricultural land including its settlement of 60 million hectares for attainment of middle-income status by the year 2020.

Therefore, effective community and user participation in the development of their local natural resources, rehabilitation and protection of degraded forest areas from the pre-investment planning implementation, operation and evaluation of rehabilitation, is considered paramount in the project as a means towards integrated forest resource development and management at the community level with sustainability as a primary goal.

Economic activity in the forest zone of Indonesia is largely agricultural based and there is the need to maintain the productive potential of the forest through sound practices and the agronomic methods include rapid establishment of vegetation cover to protect the soil surface and water resources.

Therefore, the project design should improve the following aspects:

- Productivity: improved output of tree products, improved yields of associated crops and satisfaction of basic domestic material needs.
- Sustainability: by seeking improvements in the forest ecosystem, rehabilitation can achieve its goals while appealing directly to motivation of low-income farmers, who may not always be interested in conservation for its own sake.
- Adoption: no matter how technical elegant or environmentally sounds the design of forest rehabilitation may be, nothing practical is achieved unless its intended user adopts it. This project would be designed to fit the social as well as the environmental characteristic of the forest use system for which it is designed.

6. Environmental aspects

After 1997, deforestation rate in Indonesia is estimated about 3.2 million hectare annually due to logging, illegal logging, forest fire and shifting cultivation. To speed up reforestation program, the Industrial Forest Plantation has been established

as priority program of the Ministry of Forestry. Some exotic species such as *Acacia mangium*, *Albizia spp.*, *Gmelina arborea*, and *Eucalyptus sp* have been used for large scale. These plantations have low diversity of both in plants and animal species, while their soils are still prone to erosions.

The other potential tropical tree species are still neglected due to their silviculture characteristic has not been mastered yet. There are currently very limited successful programmes for the rehabilitation of degraded forest using indigenous species. In terms of environmental aspects, the use of indigenous species for reforestation of degraded forest might be more promising in the long-term goal for tropical forest management. Besides plantation of the fast growing tree species there should be the development of sustainable forest management based on indigenous species and plantation in rehabilitating forests.

Since among the selected species (*Aquilaria malaccensis*, *Shorea stenoptera*, *Dyera costulata*) are under the protection of CITES and Government of Indonesia, the project directly will contribute to the species conservation. The local community proposed those species to be planted in demonstration plantation area.

7. Social aspects

For the full participation of local communities in implementation of the project strategy, a number of activities are presented below to be able to foster this involvement in terms of participatory reflection and action. This section outlines the approach and methodology that would be adopted in capturing the social aspects.

(a) Planning communication

Lack of communication between project planners, implementation agencies and communities produce a major cause of failures in many projects. Policies and plans designed must always be clearly understood by community members and representative so that they can be responsive to project needs and desires.

To ensure sustainability of rehabilitation of degraded areas to be initiated under the project, community management and community ownership of the improved forest would be the foundation upon which the project team's approaching dealing with the communities in the project zone would be initiated. The development of high level of community involvement and organization will be

an overall objective that will be taken into consideration at all stages of the project cycle.

Consequently, the first major activity in each community within the project area will be planning communication.

The planning communication will be focused on:

- Introduce the project to the communities;
- Ensure that all actors and stakeholders understand the project concept, the opportunities, limit and modalities, and roles and responsibilities of the various actors;
- Enable the project team capture preliminary data/information that will be useful for planning of detailed field activities in connection with project;
- Ensure agreement on subsequent activities and secure maximum co-operation from all stakeholders; and
- Determine the limiting factors community participation to find out the solutions in order to achieve the project objectives.

(b) Analysis of the environment, social-economic and cultural aspects

To asses demands for improved management of tropical forest resources, past and potential use of indigenous species, maintenance and protection, and how much in terms of resources that communities are willing to commit for these improvements, it will be necessary to understand how household perceive of the advantage and disadvantage of the degradation and rehabilitation of tropical forests, and sensitize them on their desired options

While the support and overall co-ordination of project activities would be responsibility of the project's management team, the effort towards mobilization, participatory planning, and implementation of projects for individual communities would be undertaken under the leadership of community level organizations. Other support could possibly come from associations supported by the district level or non-governmental organizations with the requisite technical, communication and organization skills to supplement community inputs. The output will be used for empowerment and mobilization the local communities to improve and maintain the management of forest with minimum external assistance.

8. Risk

The potential risk to the success of the project may be a prolonged dry season, which may affect the growth of the planted seedlings and of other species to be collected into plantation. Other risk anticipated includes fire and destruction of plants by animals and humans. Therefore local communities will identify appropriate methods of dealing with this and they will be given the training and logistic to implement them. The continuing deforestation will probably affect the collected endemic species for planting materials. If this happen, transportation of seeds and seedling from the long distance place will need special effort to reduce the risk.

9. Outputs

Specific Objective 1 : To determine of recovery process for rehabilitating the degraded forest ecosystem using indigenous species

Output 1.1. Data on physical, chemical and ecological properties of selected sites is available.

Output 1.2. Silvicultural systems of indigenous species and its site – species matching is established

Specific Objective 2 : To establish demonstration plantations for rehabilitation of degraded forests through capacity building of local communities

Output 2.1. Demonstration plantation using seedlings of indigenous species in good quality and in sufficient number is established.

Output 2.2 Determination of management options for recovering degraded areas and capacity building of local community is run.

10. Activities

Output 1.1 Data on physical, chemical and ecological properties of selected sites is available.

Activity 1.1.1. Study on soil properties of selected sites

Activity 1.1.2. Study on amelioration of soil properties

- Output 1.2.** Silvicultural systems of indigenous species and its site – species matching is established
- .Activity 1.2.1.** Determination of appropriate silvicultural systems of indigenous species either for enrichment planting or block planting in respective degraded site.
 - Activity 1.2.2.** Study on site-species matching
- Output 2.1.** Demonstration plantation using seedlings of indigenous species in good quality and in sufficient number is established.
- Activity 2.1.1** Nursery establishment for planting material production of selected species.
 - Activity 2.1.2** Land preparation and plantation establishment in selected sites
 - Activity 2.1.3** Forest Plantation tending
- Output 2.2** Determination of management options for demonstration plantation and capacity building of local community is run.
- Activity 2.2.1.** Determination of management options of the Demonstration Plantation
 - Activity 2.2.2.** Local community empowerment including awareness campaign of the rehabilitation project and lessons learned from trainings on propagation of planting materials (seedling production), site preparation, and planting methods
 - Activity 2.2.3.** Workshop on completion in rehabilitating the degraded forest

11. Logical Framework Matrix

Project Elements	Indicators	Means of verification	Relevant Assumption
Development objective To secure the continuity of timber production using indigenous species with regards to the empowerment of local community in developing the demonstration plantation in degraded forest areas.	The demonstration plantation is established using indigenous species in 6 sites and the community actively participates in the program to secure the timber production.	Rehabilitation of degraded forest increased.	The government policies support the programs.
Specific Objectives 1			
To determine of recovery process for rehabilitating the degraded forest ecosystem using indigenous species.	Silvicultural factors influencing the success of reforestation in degraded forest is understood.	All collected data supports the recovery process of degraded forest	Sufficient knowledge and experiences in recovery process of degraded forest.
Specific Objectives 2			
To establish demonstration plantations for rehabilitation of degraded forests through capacity building of local communities	Socio-economic factors influencing the success of reforestation in degraded forest is understood.	All collected data supports the local community empowerment for rehabilitating the degraded forest	The government policies support the programs.
Output 1.1 Data on physical, chemical and ecological properties of selected sites is available	Ecological factors influencing the success of reforestation in degraded forest is understood.	All collected data supports the recovery process of degraded forest.	Sufficient knowledge on biogeochemistry process.
Activity 1.1.1. Study on soil properties of selected sites	Better understanding on recovery process of degraded forest soil.	Report on soil properties	Equipment is available
Activity 1.1.2. Study on amelioration of soil properties	Better understanding on culture media properties to support better seedling growth	Report on different techniques of soil properties amelioration.	The material for soil amelioration is understood and available.
Output 1,2 Silvicultural systems of indigenous species and its site-species matching is established	Silviculture of indigenous species is mastered.	Data on different silviculture techniques is well documented	Appropriate silvicultural techniques is known.

Activity 1.2.1. Determination of appropriate silvicultural systems of indigenous species either for enrichment planting or block planting in respective degraded site.	Silvicultural system in each respective site is determined.	Report on silvicultural systems.	Sufficient knowledge on silvicultural characteristics of each indigenous species.
Activity 2.1.1 Nursery establishment for planting material production of selected species.	Established nursery in 6 sites to produce good quality of seedlings in sufficient number.	Report on nursery establishment	The planting material from indigenous species seedlings are available in good quality and in number
Activity 2.1.2 Land preparation and plantation establishment in selected sites	Plantation of indigenous species in 6 sites is established through community participation.	Report on plantation establishment of indigenous species.	The indigenous species seedlings are available in good quality and in sufficient number.
Activity 2.1.3 Forest Plantation tending	The plantation well maintain by the community	Report on growth performance	The communities are willing to maintain the plantation.
Output 2.2. Determination of management options for demonstration plantation and capacity building of local community is run.	Community empowerment worked well and management plans is made	Reports of several activities are available.	Local communities are willing to support the continuing programs.
Activity 2.2.1. Determination of management options of the Demonstration Plantation	Management option of demonstration plot in each site is carried out.	Report on plantation management including yield regulations	Contractual agreement to maintain the demonstration plantation is signed
Activity 2.2.2. Local community empowerment including awareness campaign of the rehabilitation project and lessons learned from trainings on propagation of planting materials (seedling production), site preparation, and planting methods	The community awareness to rehabilitate degraded forest increased. The skill and knowledge of the local community on seedling production, site preparation and planting methods increased.	<ul style="list-style-type: none"> - Report on training programs including its modules. - Report on community involvement on each activity. 	The community is willing to participate in the training programs.
Activity 2.2.3. Workshop on completion in rehabilitating the degraded forest	Number of participants, and workshop materials are achieved.	Proceeding of workshop	Activities and Research results are achieved.

12. Work Plan

Output / Activities	Responsible Party	Year 1 (Quarterly)				Year 2 (Quarterly)				Year 3 (Quarterly)			
		1	2	3	4	1	2	3	4	1	2	3	4
Output 1.1 Data on physical, chemical and ecological properties of selected sites is available													
Activity 1.1.1 Study on soil properties of selected sites		■	■										
Activity 1.1.2. Study on amelioration of soil properties				■	■								
Output 1.2. Silvicultural systems of indigenous species and its site – species matching is established													
Activity 1.2.1 Determination of appropriate silvicultural systems of indigenous species either for enrichment planting or block planting in respective degraded site.				■	■								
Activity 1.2.2. Study on site-species matching.				■	■	■	■	■	■	■	■	■	■
Output 2.1: Demonstration plantation using seedlings of indigenous species in good quality and in sufficient number is established.													
Activity 2.1.1 Nursery establishment for planting material production of selected species.			■	■	■	■	■	■	■	■	■	■	■
Activity 2.1.2 Land preparation and plantation establishment in selected sites			■	■	■	■	■	■	■	■	■	■	■
Activity 2.1.3 Forest Plantation tending			■	■	■	■	■	■	■	■	■	■	■
Output 2.2: Determination of management options for demonstration plantation and capacity building of local community is run.													
Activity 2.2.1. Determination of management options of the Demonstration Plantation						■	■	■	■				

Activity 2.2.2. Local community empowerment including awareness campaign of the rehabilitation project and lessons learned from trainings on propagation of planting materials (seedling production), site preparation, and planting methods																	
Activity 2.2.3. Workshop on completion in rehabilitating the degraded forest																	
Project Management																	
PEA meetings																	
PSC meeting																	
Project Evaluation																	

13. Budget

7.1 Overall Project Budget by Activity

OUTPUT / ACTIVITIES + Non - activity Based Expenses	BUDGET COMPONENTS (US \$)							
	10 Project Personal	20 Sub- contracts	30 Duty Travel	40 Capital Items	50 Consuma ble Items	60 Miscellan eous	Quarter Year	Grand Total
Output 1.1 Data on physical, chemical and ecological properties of selected sites is available								
Activity 1.1.1 Study on soil properties of selected sites	2,040 (I)	-	3,620 (I)	-	-	480 (I)	Q ₁ – Q ₂ Y ₁	6,140 (I)
Activity 1.1.2. Study on amelioration of soil properties	2,040 (I)	-	3,620 (I)	-	2,500 (I)	-	Q ₃ -Q ₄ Y ₁	8,160 (I)
Subtotal 1	4,080 (I)		7,240 (I)	-	2,500 (I)	480 (I)	Q ₁ - Q ₄ Y ₁	14,300 (I)
Output 1.2. Silvicultural systems of indigenous species and its site – species matching is established								
Activity 1.2.1 Determination of appropriate silvicultural systems of indigenous species either for enrichment planting or block planting in respective degraded site.	4,710 (I)		4,520 (I)	-	-	-	Q ₃ Y ₁ – Q ₃ Y ₃	9,230 (I)
Activity 1.2.2. Study on site-species matching.	2,250 (I)		6,480 (I)	-	-	-	Q ₃ Y ₁ – Q ₃ Y ₃	8,730 (I)
Subtotal 2	6,960 (I)		11,000 (I)	-	-	-	Q ₃ Y ₁ – Q ₃ Y ₃	17,960 (I)
Output 2.1 : Indigenous species used for the rehabilitation of secondary and degraded forests, such as meranti (<i>Shorea spp.</i>), <i>Shorea stenoptera</i> (ellipse-nut tree), <i>Durio sp.</i> (local fruit tree) and other endemic species determined.								
Activity 2.1.1 Survey and quantify the potential indigenous species as planting material	4,500 (I)	300,000(I)	4,650 (I)	36,000 (I)	-	-	Q ₂ Y ₁ Q ₃ Y ₃	345,150 (I)
Activity 2.1.2 Determining the indigenous species in the implementation of rehabilitation strategy	98,700 (I)		8,200 (I)	42,850(I) 46,500(E)	-	-	Q ₂ Y ₁ - Q ₃ Y ₃	196,250 (I+E)
Activity 2.1.3 Forest Plantation tending	42,000 (I)	-	8,055 (I)	-	-	-	Q ₂ Y ₁ – Q ₃ Y ₃	50,055 (I)
Subtotal 3	145,200 (I)	300,000(I)	20,905 (I)	125,350 (I+E)	-	-	Q ₂ Y ₁ – Q ₃ Y ₃	591,455 (I+E)

Output / Activities	BUDGET COMPONENTS (US \$)							
	10 Project Person al	20 Sub- contrac ts	30 Duty Travel	40 Capital Items	50 Consu mable Items	60 Miscell aneous	Quarter Year.	Grand Total
Output 2.2: A comprehensive project proposal following the ITTO format with detailed specification of all inputs and activities for implementing the proposed strategy and fully budgeted by component, activity and <u>source</u> developed.								
Activity 2.2.1 Discussing, producing, and disseminating results of all activities made, including determination of pilot-project site for SFM.	3,300 (I)	-	4,400 (I)	-	-	-	Q1Y2 – Q4 Y2	7,700 (I)
Activity 2.2.2 Developing a comprehensive project proposal with detailed specification of all inputs and activities and fully budgeted by component, activity and <u>source</u> .	5,880 (I)	-	4,520 (I)	-	-	-	Q1Y1 – Q4 Y3	10,400 (I)
Activity 2.2.3. Workshop on completion in rehabilitating the degraded forest	7,500 (I)		6,760 (I)				Q4 Y3	14,260 (I)
Subtotal 4	16,680 (I)	-	15,680 (I)	-	-	-	Q1Y1 – Q4 Y3	32,360 (I)
NON ACTIVITY BASED EXPENSES								
(1) Fuel and utilities					5,400 (I)		Y1 to Y3	5,400 (I)
(2) Office Supplies					7,200 (I)		Y1 to Y3	7,200 (I)
Subtotal 5					12,600 (I)		Y1 to Y3	12,600 (I)

Output / Activities	BUDGET COMPONENTS (US \$)							
	10 Project Person al	20 Sub- contrac ts	30 Duty Travel	40 Capital Items	50 Consu mable Items	60 Miscell aneous	Quarter Year.	Grand Total
Project Management								
PEA Meetings	6,000 (I)							6,000 (I)
PSC Meetings	6,000 (I)							6,000 (I)
Project Evaluation	-	-	-	-	-	2,500 (I)		2,500 (I)
Salaries	54,000 (E)							54,000 (E)
Subtotal 6	66,000 (E+I)					2,500 (I)	Q ₁ Y ₁ to Q ₄ Y ₃	68,500 (I+E)
Subtotal (ITTO)	184,920	300,000	54,825	78,850	15,100	2,980		636,675
Subtotal (E. Agency)	54,000	-		46,500	-			100,500
Total	238,920	300,000	54,825	125,350	15,100	2,980	Y1 - Y3	737,175

(I) = contribution of the ITTO

(E) = contribution of executing agency / Government of Indonesia.

13.2 Consolidated Total and Yearly Project Budgets

	Budget Components	Project Budget (3 years)			
		Total (US\$)	Year 1	Year 2	Year 3
10.	Project Personal				
	11. National Experts	12,000	4,500	1,500	6,000
	12. National Consultants	3,000	1,500	-	1,500
	13.1. Other labour	139,620	47,800	45,910	45,910
	13.2. Administrative Personal	7,200	2,400	2,400	2,400
	14. Fellowship and Training	15,600	5,800	5,800	4,000
	15. International experts	7,500	7,500	-	-
	16. International Consultant	-	-	-	-
	17. Salaries of Project personnel	54,000	18,000	18,000	18,000
	19 Component Total	238,920	87,500	73,610	77,810
20	Sub Contract				
	21. Subcontract	300,000	100,000	100,000	100,000
	29. Component Total	300,000	100,000	100,000	100,000
30.	Duty Travel				
	31. Daily subsistence allowance	34,985	13,815	10,385	10,785
	32. International travel	2,500	2,500	-	-
	33.1. Domestic air travel	2,000	800	200	1,000
	33.2. Local Transport costs	15,340	6,105	5,500	3,735
	39. Component Total	54,825	23,220	16,085	15,520
40.	Capital Items				
	41. Premises	36,000	10,800	14,400	10,800
	42. Land	-	-	-	-
	43. Vehicles	-	-	-	-
	44. Capital equipment	89,350	59,355	17,140	12,855
	49. Component Total	125,350	70,155	31,540	23,655
50.	Consumable items				
	51. Raw materials	2,500	2,500	-	-
	53. Fuel and utilities	5,400	1,800	1,800	1,800
	54. Office supplies	7,200	2,400	2,400	2,400
	59. Component Total	15,100	6,700	4,200	4,200
60.	Miscellaneous				
	61. Sundry	480	480	-	-
	62. Auditing	2,500	-	-	2,500
	63. Contingency	-	-	-	-
	69. Component Total	2,980	480	-	2,500

70	Executing Agency Management Cost				
	71 Management costs (15%)	110,576	43,208	33,815	33,553
	79 Component Total	110,576	43,208	33,815	33,553
	Sub Total	847,751	331,263	259,250	257,238
80.	ITTO Monitoring, Evaluation and Adm.				
	81. Monitoring and Review Costs	9,000			
	82. Evaluation Costs	-			
	83. Program Support/Adm.Costs (6%)	50,865			
	89. Component Total	59,865			
	GRAND TOTAL	907,616			

13.2.1 Consolidated Total Project – Budget by Source - ITTO

	Budget Components	Project Budget (3 years)			
		Total (US\$)	Year 1	Year 2	Year 3
10.	Project Personal				
	11. National Experts	12,000	4,500	1,500	6,000
	12. National Consultants	3,000	1,500	-	1,500
	13.1. Other labour	139,620	47,800	45,910	45,910
	13.2. Administrative Personal	7,200	2,400	2,400	2,400
	14. Fellowship and Training	15,600	5,800	5,800	4,000
	15. International experts	7,500	7,500	-	-
	16. International Consultant	-	-	-	-
	17. Salaries of Project personnel	-	-	-	-
	19. Component Total	184,920	69,500	55,610	59,810
20	Sub Contract				
	21. Subcontract	300,000	100,000	100,000	100,000
	29. Component Total	300,000	100,000	100,000	100,000
30.	Duty Travel				
	31. Daily subsistence allowance	34,985	13,815	10,385	10,785
	32. International travel	2,500	2,500	-	-
	33.1. Domestic air travel	2,000	800	200	1,000
	33.2. Local Transport costs	15,340	6,105	5,500	3,735
	39. Component Total	54,825	23,220	16,085	15,520

40.	Capital Items				
	41. Premises	36,000	10,800	14,400	10,800
	42. Land	-	-	-	-
	43. Vehicles	-	-	-	-
	44. Capital equipment	42,850	12,855	17,140	12,855
	49. Component Total	78,850	23,655	31,540	23,655
50.	Consumable items				
	51. Raw materials	2,500	2,500	-	-
	53. Fuel and utilities	5,400	1,800	1,800	1,800
	54. Office supplies	7,200	2,400	2,400	2,400
	59. Component Total	15,100	6,700	4,200	4,200
60.	Miscellaneous				
	61. Sundry	480	480	-	-
	62. Auditing	2,500	-	-	2,500
	69. Component Total	2,980	480	-	2,500
70	Executing Agency Management Cost				
	71 Management costs (15%)	-	-	-	-
	79 Component Total	-	-	-	-
	Sub Total	-	-	-	-
80.	ITTO Monitoring, Evaluation and Adm.				
	81. Monitoring and Review Costs	9,000			
	82. Evaluation Costs	-			
	83. Program Support/Adm.Costs (6%)	50,865			
	89. Component Total	59,865			
	GRAND TOTAL	696,540			

13.2.2 Consolidated Total Project – Budget by Source – Executing Agency

	Budget Components	Project Budget (3 years)			
		Total (US\$)	Year 1	Year 2	Year 3
10.	Project Personal				
	11. National Experts	-	-	-	-
	12. National Consultants	-	-	-	-
	13.1. Other labour	-	-	-	-
	13.2. Administrative Personal	-	-	-	-
	14. Fellowship and Training	-	-	-	-
	15. International experts	-	-	-	-
	16. International Consultant	-	-	-	-
	17. Salaries of Project personals	54,000	18,000	18,000	18,000
	19. Component Total	54,000	18,000	18,000	18,000

20	Sub Contract				
	21. Subcontract	-	-	-	-
	29. Component Total	-	-	-	-
30.	Duty Travel				
	31. Daily subsistence allowance			-	-
	32. International travel	-	-	-	-
	33.1. Domestic air travel	-	-	-	-
	33.2. Local Transport costs	-	-	-	-
	39. Component Total	-	-	-	-
40.	Capital Items				
	41. Premises	-	-	-	-
	42. Land	-	-	-	-
	43. Vehicles	-	-	-	-
	44. Capital equipment	46,500	46,500	-	-
	49. Component Total	46,500	46,500	-	-
50.	Consumable items				
	51. Raw materials	-	-	-	-
	52. Spares	-	-	-	-
	53. Fuel and utilities	-	-	-	-
	54. Office supplies	-	-	-	-
	59. Component Total	-	-	-	-
60.	Miscellaneous				
	61. Sundry	-	-	-	-
	62. Auditing	-	-	-	-
	63. Contingency				
	69. Component Total				
70	Executing Agency Manage. Cost				
	71 Management costs (15%)	110,576	43,208	33,815	33,553
	79 Component Total	110,576	43,208	33,815	33,553
	GRANT TOTAL,	211,076	107,708	51,815	51,553

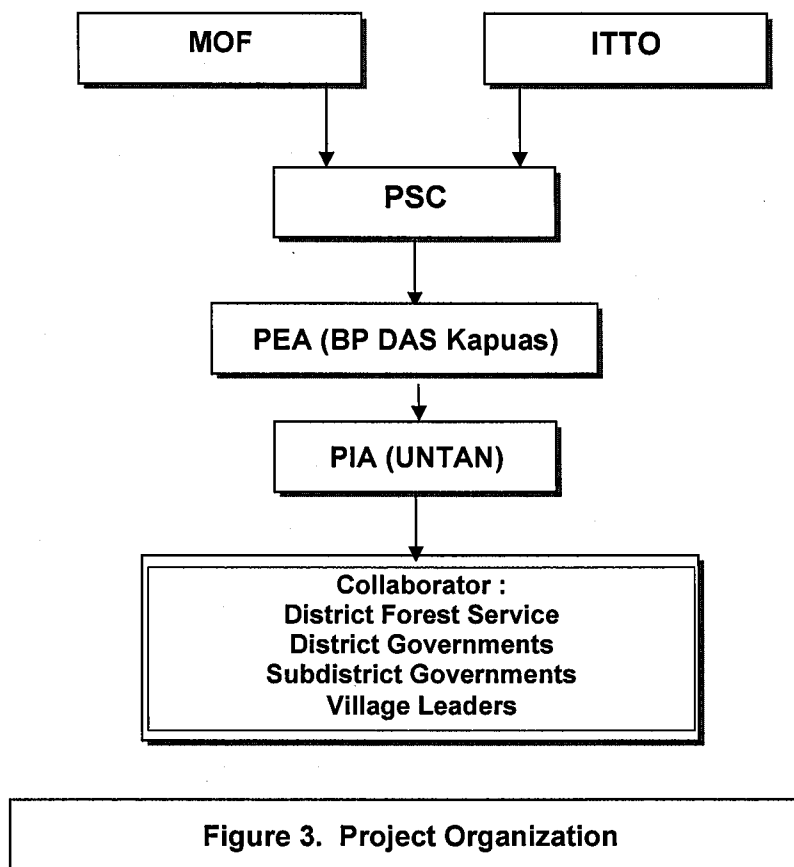
OPERATIONAL ARRANGEMENTS

1. Management Structure

The project activities will be coordinated by the Project Manager of the Project Implementing Agency (PIA) under supervision of the Project Steering Committee (PSC), and Project Executing Agency (PEA).

It will be accountable to the Project Steering Committees chaired by the Director General of Land Rehabilitation and Social Forestry, the Ministry of Forestry, while the Director of Bureau International Cooperation and Investment Ministry of Forestry (MOF), the representative of ITTO, Head of BP DAS Kapuas, PT. Sari Bumi Kusuma will be the members. The structure of the project organization is shown in Figure 3.

The PSC meeting will be conducted every 6 months, while for the PEA meeting every 3 months.



The role of the Project Steering Committee is to guide and to monitor the project, to approve work plan, progress and annual reports, to examine the project management, and to report to the ITTO Head Quarter. In overall the Project Steering Committee functions as project governance body.

Project Implementing Agency staff will include Project Management staffs and scientists. Project management staffs consist of the Representative of the Project Executing Agency, the Chairman of the Project Implementing Agency or the Dean Faculty of Forestry, the Project Manager. The scientists will be invited from National and International experts. The organization of the Project Implementing Agency is shown in Figure 4.

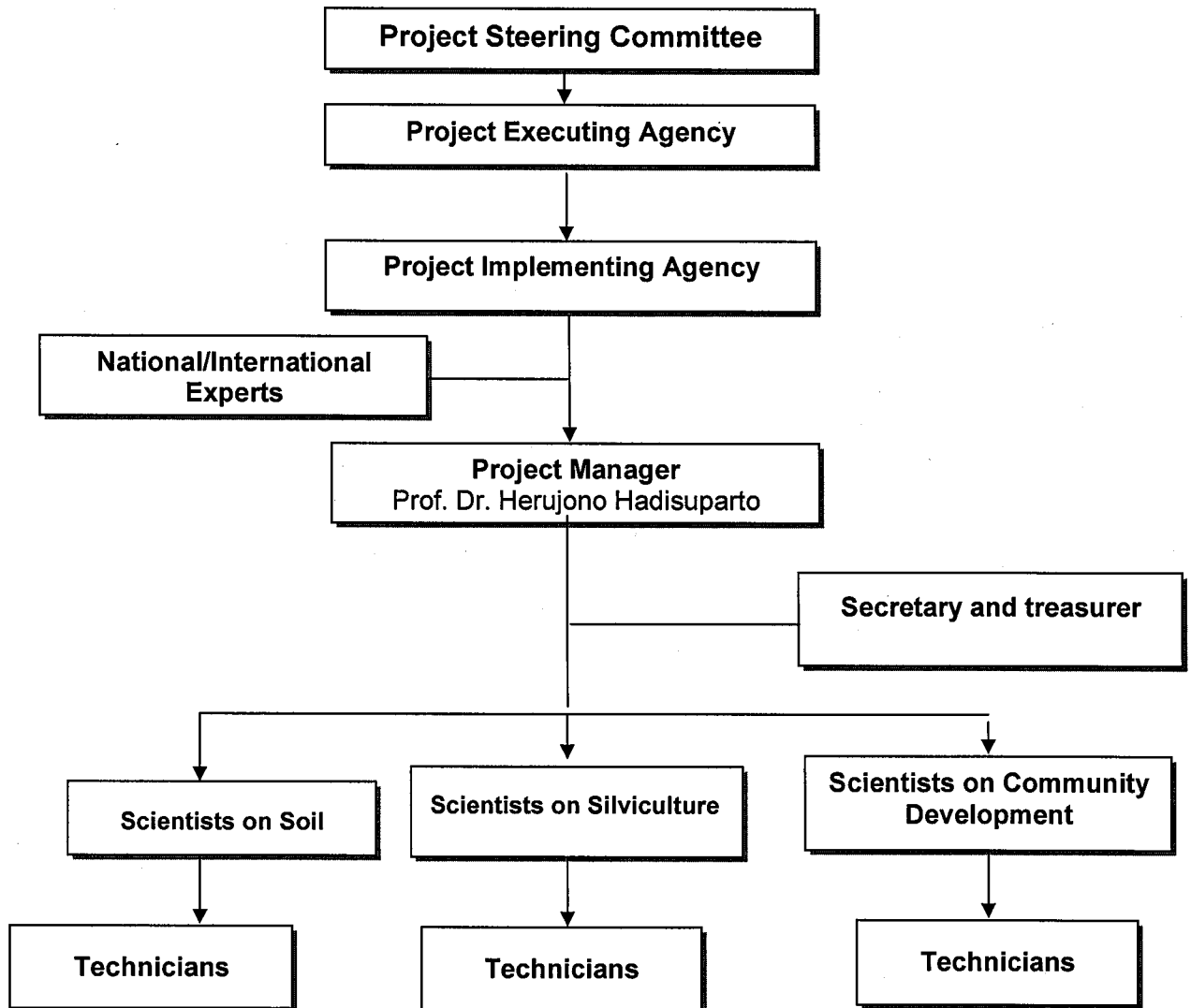


Figure 4. Project Implementing Agency Organization

The curriculum vitae of key staffs (Dean of Faculty of Forestry, Project Manager, Secretary, scientists on soil, silviculture and community development) are attached as Annexes.

2. Monitoring, Reporting and Evaluation

a. Arrangements for Reporting

The project will submit a progress report (quarterly report) to the ITTO Secretariat every four months and other reports upon the request of the ITTO Head Quarter. Annual Report will be submitted after the review of Project Steering Committee. An independent financial auditor will also be appointed to audit the financial cash flow of the Project Executing Agency and Implementing Agency. On project completion, a final report will be submitted to ITTO within three months of the date of completion.

b. Arrangement for ITTO Monitoring and Review

Every year, the ITTO Secretariat will carry out a project monitoring and review mission in study site. The Project Steering Committee meeting will also be convened each year in order to review the general progress of the project, to solve unexpected problems and to endorse the PSC minutes to the ITTO. A workshop will be held towards the completion of the project in order to approve its results. It will involve the representatives of the public and private sectors and NGO's, one representative from the ITTO and external experts concerned.

c. Evaluation

A project evaluation mission will be conducted annually. Three months before project completion, the ITTO Head Quarter will evaluate the project results. The recommendations resulting from the evaluation could be used to plot the broad outline for the next phase. Nevertheless, during monitoring missions, the Secretariat of ITTO will be entitled to carry out an early mid-term review if it so decides. Post-project evaluation will also be carried out to evaluate the project sustainability.

3. Future Operation and Maintenance

On project completion, the relevant Indonesian Ministry (Ministry of Forestry, Ministry of Industry, National Institute for Industry, Ministry of National Education) will pursue the research and development and the Ministry of Forestry of each collaboration institutions will undertake the demonstration activities and the management of project.

The established facilities will continue to be used for training purposes.

The plantations that will be established through the project will be operated and maintained by Kapuas Watershed Management Agency, local Forest Service and Forestry Faculty - Tanjungpura University with the collaboration with the local communities and advice from the Ministry of Forestry and local government level.

In view of the importance of timber trade to the economy and forest estates to the conservation of biodiversity and maintenance of soil fertility all in Indonesia, the project has the support of the government. Forestry projects are essentially long term. However it is hoped that the project objectives will be achieved in 6 years, but there will be future work

which will focus on the following;- (i) capacity building of local communities to undertake maintenance and protection of their plantations; (ii) increase the size of their plantations; (iii) transfer of knowledge from participation communities to non participating ones; and (iv) facilitate the marketing of future thinning and other products from the plantations.

The responsibilities of the institution are as follows:

The Agency of Kapuas Watershed Management of West Kalimantan with the collaboration with Forestry Faculty will carry out the following activities :

- Identification of project sites in collaboration with the Ministry of Forestry;
- Monitor all project activities;
- Provide data and information for progress reports and publish papers;
- Design training in collaboration with local communities;
- Conduct of implementation all socio - economic activities

The Forestry Faculty Tanjungpura University will carry out the following activities :

- Design and conduct training of local communities in plantation establishment techniques;
- Prepare progress reports on all training activities;
- Establish demonstration plantation with the collaboration of local communities;
- Design and conduct research experiment;
- Monitor all project activities;
- Compile progress reports and publish scientific papers;
- Organized all workshops.

Ministry of Forestry with the collaboration with Forestry Faculty will carry out :

- Providing advice on project sites
- Providing technical advice on plantation establishment and maintenance;
- Providing advice on Implementation all socio-economic activities.

Local (Regency) Government with collaboration with Forestry Faculty will carry out :

- Identification of communities to take part in project;
- Involve in the plantation establishment and maintenance by local communities.

Key Staff who will implement the project evaluation, as follows:

1. Dr. Herujono Hadisuparto (Forest Soil / Forest Management)
2. Ir. Suhartadi (Forest Economic)
3. Ir. Harsoli (Silviculture / Forest Management)
4. Dr. Syamsuni Arman (Social / Community Development)
5. Ir. M. Dirhamsyah, MS (Forest Product)
6. Ir. Gusti Hardiansyah, MSc (Social Forestry)
7. Ir. Burhanuddin, MS (Silviculture)
8. Ir. Efendi Manulang (Forest ecology)
9. Official of Ministry of Forestry (to be determined).
10. Local representatives (liaison officer of targeted district, local communities)
11. Consultant (to be determined).

Their responsibilities will be :-

- Dr. Herujono Hadisuparto : Project Coordinator - Forestry Faculty of Tanjungpura University. Responsible for the design of the project with advise from the consultant, Execution and coordination of all aspects of the project. Collection and collation of project reports for all participating scientist and community project teams. All ecological aspects of the project.
- Ir. Suhartdi - Kapuas Watershed Management Agency (BP DAS Kapuas). Responsible for liaising with local communities and economist studies and in the establishment of the demonstration plantation. He is also responsible for development of manuals and guidelines.
- Ir. Hiarsoilih - Forest Service of West Kalimantan. Responsible for facilitating the selection of participating local communities in collaboration with others and provide technical advice on plantation establishment and Forest Mangement).
- Dr. Syamsuni Arman – Social and Politic Faculty of Tanjungpura University. Responsible for training local communities and social studies. Also responsible in compiling the manuals and guidlines.
- Ir. M. Dirhamsyah, MP. Forestry Faculty of Tanjungpura University. Responsible for liaising with local communities and in the establishment of the demonstration plantation. Also responsible for organizing workshop.
- Ir. Gusti Hardiyansyah, MSc. Forestry Faculty of Tanjungpura University. Responsible for liaising with other stakeholders and in the establishment of the demonstration plantation. He also responsible for organizing workshop.
- Ir. Burhanuddin, MP - Forestry Faculty of Tanjungpura University. He will be responsible for liaising with local communities and training local community in propagation of planting material, demonstration plantation establishment techniques, maintenance and protection.
- Ir. Efendi Manulang - Forestry Faculty of Tanjungpura University. He will be responsible for liaising with local communities and training local community in Forest Ecology including land preparation and demonstration plantation establishment techniques, maintenance and protection.
- Local representatives : Responsible for representing local communities on Monitoring and Evaluation, acts liaison officer between local communities and other key project staff, and organizing for all project activities.
- Consultants : Responsible for scientific advice on project design, planning and implementation as well as advice on publication of manuals, guidelines and scientific papers.

TROPICAL TIMBER FRAMEWORK

1. Compliance with ITTA 1994 Objectives

This forest rehabilitation project through local community participation would have compliance with the ITTO objectives as indicated in the following statements: (i) As a demonstration plantation it would provide an effective framework for cooperation and consultation on aspects of the tropical timber that are produced from selectively logged over and plantation forests; (ii) It would also help research and development which will improve forest management and use; (iii) It will encourage tropical timber reforestation and forest management and (iv) It will encourage national policies which aim at sustainable use and conservation of tropical forest and their genetic resources and at maintaining the ecological balance in Indonesia.

2. Compliance with ITTO Action Plan

This project satisfies all ITTO Action Plan because (i) It will lead to the production and use of industrial tropical timber from forest plantations using enrichment planting and block planting through the development of local community capacity in forest establishment and protection; (ii) the production of tropical timber from forest plantations will increase the volume of tropical timber and therefore this will yield benefits to the tropical country economy as a whole and therefore relevant to both producing and consuming countries; and (iii) the production of tropical timber from forest plantation will increase the volume of tropical timber, hence it will maintain and expand the international trade in tropical timber, (iv) the areas to be used for the plantations would be degraded forest and therefore it offers reasonable prospect for positive economic return and ecologically sustainable natural resources. It will make maximum use of existing research institutions and avoid duplication of efforts to the maximum extent.

The proposal is related to elements and priorities on- :

(i) Identification of field demonstration project where sustainable production of timber and non-timber products may be combined (ii) comparative assessment of silvicultural treatments on permanent sample plots (iii) help to create net works about tropical forest management, and between tropical forestry research institutes. (iv) continued development of tropical forest practices and regulations for sustainable management of the tropical forests, taking into account the ITTO guidelines, national and local conditions (v) projects leading to the achievement of sustainability and the Year 2000 Target, to be financed through the special account (vi) re-investing forest revenue in sustainable management, regeneration and plantation development.

Conclusion

Development of a comprehensive proposal in the form of Project Document has been completed, comprising detailed specification of all inputs and activities with fully budgeted by component, activity and source.

The context consisting of origin, sectoral policies, programs and operational activities were included. The project proposal determines its objectives and describes the finding and analysis including project justification, outputs, activities, logical framework, and workplan. Operational Arrangements and Tropical Timber Framework were also described

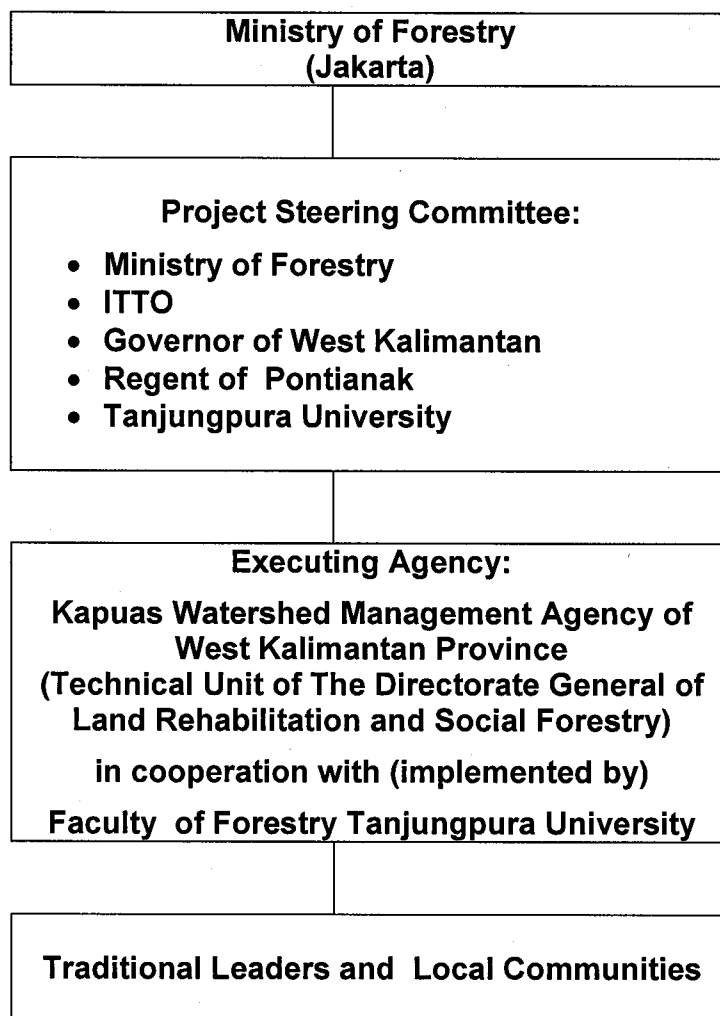
Recommendation

In this final technical report simply suggests based on inputs obtained that local communities from the rehabilitation project sites were principally agreed and very supportive to participate in the project as described in this proposal..

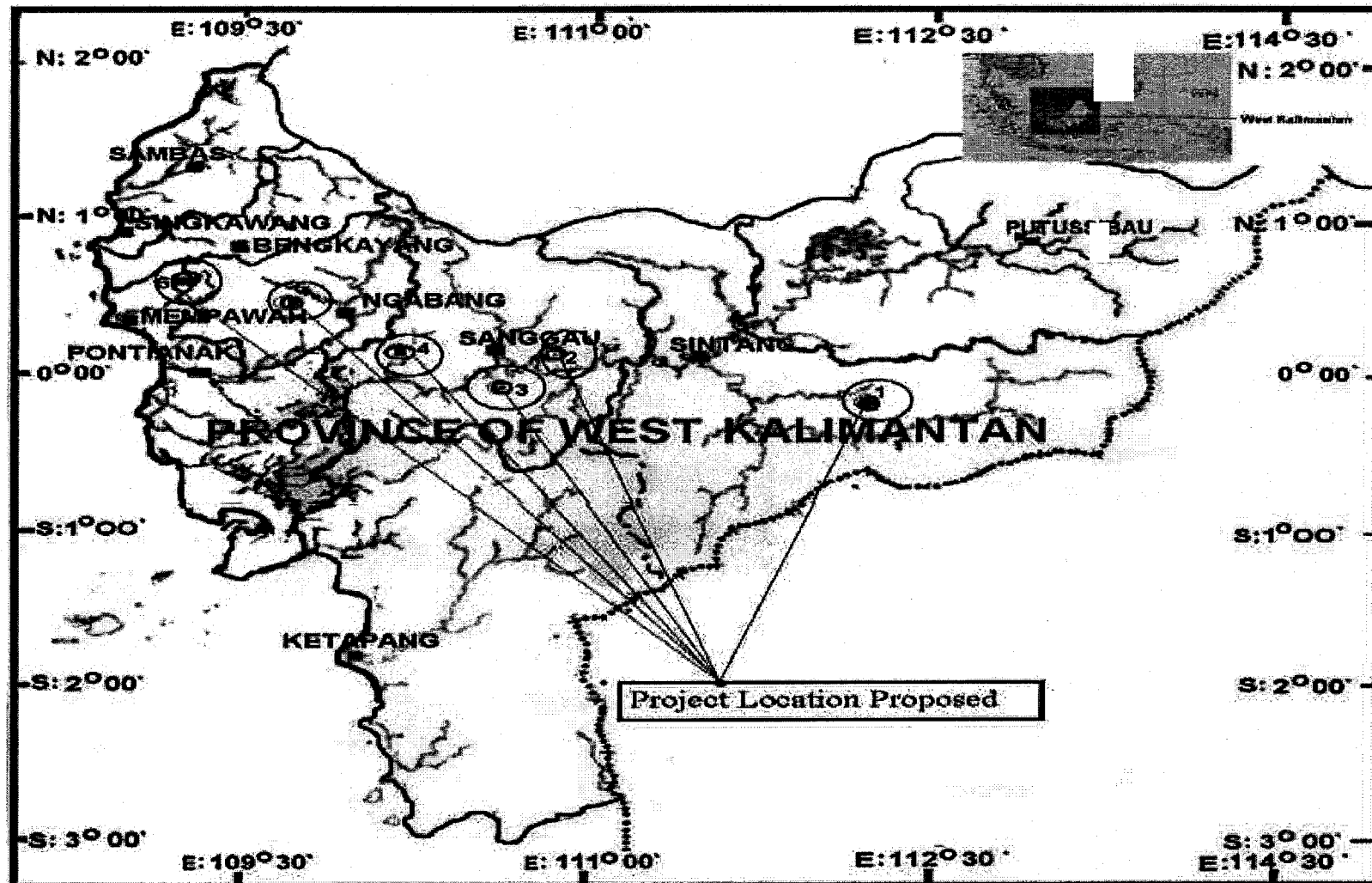
Recommendation from the stakeholders suggested that they seriously urge the rehabilitation project has to be implemented as soon as possible for several reasons. The team is hoping this proposed project document can be properly handled.

Annex 1. Project Organization

PROJECT ORGANIZATION CHART AND MANAGEMENT STRUCTURE



Annex 2. Map Of The Project Area



Annex 3. Curricula Vitae of The Key Staff

A.3-1 CURRICULUM VITAE

(Project Formulator 1)

Full Name : Dr. Herujono Hadisuparto
Date of birth : 24 December 1948
Place of birth : Yogyakarta
Country of birth : Indonesia
Present Address : Faculty of Forestry - Tanjungpura University. Pontianak,
West Kalimantan, Indonesia. Telp./ Fax. 0561-764153
Present Position : Senior Lecturer (Professor) Faculty of Forestry - Tanjungpura
University
Education :

- *Doctor of Philosophy (Ph.D.)* Dissertation on: Soil Science and Forest Hydrology, *University of Kentucky*, USA, 1985-1988
- *Master of Science (M.Sc.)* in Forestry, *University of Kentucky*, USA, 1983-1985
- *Sarjana (Ir.)* in *Forest Management (Tropical Silviculture)*, Bogor Agricultural University (affiliation), 1972-1976.

Working Experiences :

1. Professor of Faculty of Forestry, Tanjungpura University.
2. Dean of Faculty of Forestry, Tanjungpura University, Pontianak – West Kalimantan.
3. Scientific adviser of Indonesian Forest Community, 1993 - 1998.
4. Indonesian Counterpart on "Pollution Monitoring and Control (PMC) Unit of West Kalimantan and North Sumatera, 1993 - 1995.

Selected Researches / publications :

1. The Effect of Timber Harvesting and Forest Conversion on Peat Swam Forest Dynamics and Environment in West Kalimantan. *In Tropical Rainforest Research-Current Issues*. D.S. Edwards, W.E. Booth and S.C Choy (Eds). Kluwer Academic Publishers. Dordrecht/ Boston/ London; 1996.
2. Insitu Ramin (*Gonystylus bancanus Kurz*) Conservation in West Kalimantan; a Case-Study of Sungai Bakau Besar Darat Forest Ecosystem (*in Indonesian*). Forest Research and Development Agency in collaboration with Tanjungpura University; 1996/1997.
3. Physical and Chemical Properties of Rhizosperic Soil with and without mycorrhiza under the Regeneration Shorea Forest in West Kalimantan. Ecological Approach for Productivity and Sustainability of Dipterocarp Forest Proc. Faculty of Forestry-Gajahmada University and Kansai Engineering Center; 1998.

4. Post Fire Evalution and Management on Peat Forest Lands. Proc. International Workshop on Forest Fire Control and Suppression Aspects. Bogor; 1999.
5. The Impact of Forest Fire on Soil Water Regime under pine plantation of Nanga Pinoh in West Kalimantan. Proc. Int'l Symposium on Asian Tropical Forest Management. Samarinda; 1999.
6. Strategic Planning on Management and Protection Along The Forested Border Between Indonesian - Malaysia in Kalimantan, 2001.

A.3- 2. CURRICULUM VITAE

(Project Formulator 2)

Name : Dr. Ir. Supriyanto

Personal Circumstances

Place and Date of Birth : Gombong. May 10, 1955

Nationality : Indonesian

Office Address : Laboratory of Silviculture, Department of Forest
Management, Faculty of Forestry Bogor Agricultural
University, Bogor, Indonesia. Tel: 62-251-624.065.

Education :

1980 : Graduated from Department of Forest Management, Faculty of Forestry,
Gadjah Mada University, Yogyakarta.

1989 : Doctorate Degree on Plant Physiology and Forest Biotechnology,
Faculty of Sciences, University Nancy I, Nancy, France.

Professional Experience :

1990 – Now : Head Laboratory of Silviculture, SEAMEO BIOTROP, Bogor,
Indonesia.

1998 : Reviewer of ACIAR Projects on Mycorrhiza for reforestation in P.R.
China and Australia.

1997- 1999 : Chairman of the ITTO Project PD 16/95 Rev. 2 (F): Forest Health
Monitoring to Monitor the Sustainability of Indonesian Tropical Rain
Forest.

1998 : National Consultant for APFC-JIFPRO-MOFEC.

1985 – 1998 : To give lecture in several Regional Training Courses on Biological
Aspects of Silviculture at SEAMEO BIOTROP.

Publications :

- 2001 Supriyanto. Improved Forest Harvesting and Reduced Impact Logging in Asia Pacific Region. ITTO – MOF. PPD 19/99 Rev.1 (F).
- 1999 Supriyanto. The Effectiveness of Some Ectomycorrhizal Fungi in Alginate Beads in Promoting the Growth of Several Dipterocarp Seedlings. BIOTROPIA No.: 12: 59-77.
- 1998
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Annex 4. Budget Component In-Kind and Capital Items for proposed Project

4-1. Executing Agency Budget Component (in kind)

BUDGET COMPONENT	VALUE US \$	UNIT	Y.1	Y.2	Y.3	TOTAL UNIT	AMOUNT IN US \$			
			Y.1	Y.2	Y.3		Y.1	Y.2	Y.3	TOTAL
40. CAPITAL ITEMS :										
Offices	30.000	Yearly	15%	15%	15%	45%	4,500	4,500	4,500	13,500
Office Equipment (AC, Computers, Internet)	25.000	Yearly	20%	20%	20%	60%	5,000	5,000	5,000	15,000
Laboratories	60.000	Yearly	10%	10%	10%	30%	6,000	6,000	6,000	18,000
Subtotal Capital Items							15,500	15,500	15,500	46,500
PROJECT MANAGEMENT :										
Seleries	36,000	yearly	50%	50%	50%	150%	18,000	18,000	18,000	54,000
Subtotal Project Personal							18,000	18,000	18,000	54,000
GRAND TOTAL (IN KIND)							33,500	33,500	33,500	100,500

4-2 Inputs of Capital Items for Project

Capital Items	No. of Units	Unit of Cost (US \$)	Total (US \$)
41. Capital Equipment :			
Motorcycle 150 cc.	6	2,500	15,000
Chain saw	12	700	8,400
Post hole digger	12	60	720
Mattocks	150	20	3,000
Spades	150	20	3,000
Watering cans	80	10	800
Wheelbarrows	20	40	800
Compasses	8	50	400
Fire fighting shovel	24	45	1,080
Soil moisture meter	3	600	1,800
Measuring unit	3	400	1,200
Thermo-hygrometer	3	60	180
Soil thermometer	15	20	300
Measuring tapes	10	80	800
Calipers	6	75	450
Multi soil sampler	1	1,500	1,500
Rain gauges	8	240	1,920
Component Total			42,850



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**KAPUAS WATERSHED MANAGEMENT OFFICE OF THE MINISTRY OF FORESTRY
IN COLLABORATION WITH
FACULTY OF FORESTRY, TANJUNGPURA UNIVERSITY**

TECHNICAL REPORTS