# INTERNATIONAL TROPICAL TIMBER ORGANIZATION

# I T T O

## PROJECT PROPOSAL

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| TITLE | OPERATIONAL STRATEGIES FOR THE PROMOTION OF EFFICIENT UTILIZATION OF RUBBER WOOD FROM SUSTAINABLE SOURCES IN INDONESIA |
| SERIAL NUMBER | PD 523/08 Rev.1 (I) |
| COMMITTEE | FOREST INDUSTRY |
| SUBMITTED BY | GOVERNMENT OF INDONESIA |
| ORIGINAL LANGUAGE | ENGLISH |


**SUMMARY**

Indonesia is blessed with a vast rubber wood resource. Around 30,8 million m3 rubber wood biomass, consisting of 13,5 million m3 saw logs and 17,3 million m3 small-sized wood, are potentially available for use by the forest industry every year through replacement of old rubber trees. To date, only around 22% of the saw log potential and a tiny portion of available small-sized wood that have been utilized.

This proposed project aimed at contributing to the alleviation of the timber deficit problem facing the national wood industry through promotion of the efficient utilization of rubber wood biomass. Its specific objective is to promote the utilization of rubber wood from sustainable sources. Planned outputs of the project are: i) interest in the utilization of rubber wood owned by big companies increased; ii) incentives for and capacity in the utilization of rubber wood from smallholding plantations improved; iii) government policy governing rubber wood resource utilization revised and enhanced; iv) investment in rubber wood utilization increased; and v) appropriate technologies are available for the utilization of rubber wood from smallholding plantations.


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| EXECUTING AGENCY | INDONESIAN SAWMILL AND WOODWORKING ASSOCIATION (ISWA) in collaboration with THE DIRECTORATE GENERAL OF FORESTRY PRODUCTS MANAGEMENT (BPK) |
| COOPERATING GOVERNMENTS | --- |
| DURATION | 36 MONTHS |
| APPROXIMATE STARTING DATE | TO BE DETERMINED |

BUDGET AND PROPOSED SOURCE OF FINANCE

| Source | Contribution in US$ |
|---|---|
| **ITTO** | **605,094** |
| Government of Indonesia/ISWA | 302,700 |
| **TOTAL** | **907,794** |

**TABLE OF CONTENT**

## PART – I : CONTEXT

### 1. Origin

This proposed project is a follow-up to completed pre-project PPD 80/03 Rev. 2 (I) entitled *"Promoting the utilization of rubber wood from sustainable sources in Indonesia"*. The main findings of the pre-project were:

1. The total area of rubber plantation in Indonesia in 2005 was around 3,37 million Ha, distributed in Sumatra Island 2,38 million Ha (71 %), Kalimantan Island 0,83 million Ha (25 %) and other islands 0,16 million Ha (4 %).
2. In terms of ownership, bulk of plantations, 2.88 million Ha or 86%, were owned by smallholders or farmers and 0.49 million Ha or 14% by state-owned and private big companies.
3. The smallholding plantations were normally not well managed, highly fragmented with area less than 5 Ha per owner, poor accessibility, low production of latex and limited replacement of old trees thus harvesting of wood. In contrast, the large scale plantations owned by big companies were well managed with high accessibility, area of individual blocks averaging well above 500 Ha, with high yield of latex and well scheduled replacement of old plantations.
4. The big companies commonly replace plantations at 25 years of age. Applying this replacement age nation wide, the rate of replacement or replanting would be around 134.892 Ha per year, 116.000 Ha by smallholders and 18,892 Ha by big companies.
5. Based on the measurement of 30 sample plots in Sumatra and Kalimantan, it was found that the average volume of wood biomass in Sumatra and Kalimantan was 240 m3 and 200 m3 per hectare, respectively. Therefore, around 30.81 million m3 of wood biomass is harvestable per year in Indonesia of which around 13,5 million m3 were saw logs having average diameter of 20 cm and up and the balance in the form of small sized wood.
6. Out of the 13.5 million m3 of saw logs, only 2,96 million m3 or 22 % has been utilized so far, mostly originating from large scale plantation, for sawn wood and veneer and only a tiny amount of biomass has been used in MDF making in Sumatra island.
7. The extremely low rate of utilization were caused mainly by: i) lack of interest in the utilization of rubber wood owned by big companies; ii) lack of incentive and capacity in the replacement and utilization of old trees by smallholders; iii) weak government policy on rubber wood utilization; iv) lack of investment in rubber wood utilization mainly due to poor accessibility and unavailability of reliable information in terms of quantity, quality and distribution of resource; and iv) unavailability of appropriate technology for commercial utilization of rubber wood on smallholding plantations (see sections 2.1 and 2.5 for details).

This project is also a follow up to the recommendation made by the ITTO Technical Mission to Indonesia in 2001. The mission recommended that to restructure the forest industry, the government has to take action towards adoption of appropriate technology for utilizing raw material of differing quality and properties such as timber from non-traditional/non-forest sources.

### 2. Sectoral Policies

Since the log export ban policy effected in 1980, Indonesian forest industry has developed rapidly and undergone considerable changes and the sector had played vital role in economic development in terms of its contribution to GDP and creation of job opportunities. To give the flavor of this development, production of sawn wood increased from 4,8 million m3 in 1980 to 10,4 million m3 in 1989 but decreases to only 4,3 million m3 in 2005. Likewise, production of plywood and veneer rose from only 1,0 million m3 in 1980 to 9,97 million m3 in 1997 but dropped to only 4,7 million m3 in 2005. The trend is obvious, increasing quantity of wood products for the first two decades but decreasing thereafter.

Used installed production capacity of sawmilling industry was only 42 % in 2005, down from 99% in 1997. The main reason is the timber domestic supply problem, scarcity of wood raw material, supply capacity of natural forest is dwindling remarkably due to unwise management and rampant illegal logging. Another reason for the weakening wood industry is in-efficiency in processing and low quality of products brought about by the use of inappropriate, relatively old technologies, lack of professionalism at both management and operation levels and sluggish adjustment of mentality to the increasing scarcity of wood situation.

Realizing the fact that the national wood industry is weakening which certainly carries undesirable far reaching implications, the government has initiated five priority programs in the forestry sector since the early millennium, one of which is "revitalization of the forestry sector focusing on the wood industry". The other priority programs deal with: i) combating illegal logging and associated illegal timber trade, ii) rehabilitating and conserving forest resources, iii) economically empowering people living in and around forest areas, and iv) stabilizing forest land area and preventing forest fires.

Sustainable, harvestable, volume of rubber wood was estimated by PPD 80/03 Rev. 2 (I) at around 31 million Cum/a of which only a tiny part has been utilized by processing mills mainly in Sumatra Island. This sustainable resource when fully utilized would significantly reduce the raw material supply problem facing the national wood industry and increase exports of rubber wood products especially furniture parts and chip wood. It should be emphasized, however, that rubber plantations management is the jurisdiction of the Ministry of Agriculture. Therefore, policy on rubber wood utilization shall be developed as a collaborative effort of the Ministries of Forestry and Agriculture. As a matter of fact, harmonized policy between the said Ministries is far from materializing and therefore is a big challenge for this proposed project to initiate the necessary steps.

## 3. Programme and Operational Activities

Among the main activities of the wood industry revitalization program that have been implemented are:

1. To speed up the establishment of forest plantations through identification of suitable lands; the government is targeting to establish 5 million Ha of industrial forests in total until 2009 and 5.5 million ha of community-based forest plantation in ten years starting 2007.
2. To improve productivity of natural forest through enrichment planting of logged over areas using genetically improved planting materials of dipterocarps species in collaboration with forest concession holders. At least five concessionaries are currently involved in this activity targeting to establish 10,000 Ha of logged over area per annum.
3. To continuously review and enhance existing rules and regulations on wood industry development in collaboration with the Ministries of Industry and Trade and with the national timber associations including APHI, APKINDO, ISWA and ASMINDO in view of improving competitiveness of the industry and boosting exports.
4. To form BRIK (Forest Industry Revitalization Body) in 2003 mandated to oversee exportation of wood products; export permits are to be granted only to those companies that consume wood originating from legal and verifiable sources.
5. To strengthen the wood industry development strategy and improve efficiency of processing in cooperation with ITTO through implementation of relevant projects such as:
    - PD 85/01 Rev. 2 (I): Strategy for the Development of Wood-based Industries in Indonesia, completed;
    - PPD 57/02 Rev. 1 (I): Improvement of Processing Efficiency of Tropical Timber from Sustainable Sources in Indonesia, completed;
    - PD 85/01 Rev. 2 (I): Strategies for the development of wood-based industries in Indonesia, completed;

- PD 286/Rev. 1 (I): Strengthening the Capacity to Promote Efficient Wood Processing Technology in Indonesia, operational;
- PD 347/06 Rev. 3 (I): Sustainable Development of wood industry in South Kalimantan, operational.

6. To fully commit to achieving sustainable forest management in order to sustain the national forest industry. A number of activities that have been carried out to overcome the raw material supply problem include:
    a. On the supply side:
        - Forest plantation development as mentioned above
        - Introduction of genetically improved fast growing species
        - Practice of reduced impact logging
        - Rehabilitation of degraded forests
    b. On the demand side:
        - Improved processing efficiency and product quality
        - Product diversification
        - Promotion of lesser used species
7. To request for ITTO's assistance through this proposed project for promoting the utilization of wood from rubber plantations which would be as a complementary to the on-going efforts by the government and the industry to boost production and export of wood products. It is consistent with the achievement of ITTO objectives 2000 and sustainable forest management as the project is concerned with the utilization of wood from non-forest sources, reduce harvest of natural forest and sustain job opportunities in the forest industry sector.

## PART – II : THE PROJECT

### 1. Project Objectives

#### 1.1 Development Objective

To contribute to the lessening of wood raw material supply problem facing the national forest industry by utilizing the vast rubber wood available from sustainable sources.

#### 1.2 Specific Objective

To promote the utilization of rubber wood from sustainable sources.

### 2. Justifications

#### 2.1 Problems to be addressed

One of the main problems facing the wood industry in Indonesia is insufficient supply of wood raw materials. While vast of rubber wood biomass is available from rubber plantations to feed the industry thus potentially may lessen the problem, only a tiny portion of the resource has been utilized by the industry to date. Estimated total extractable volume of rubber wood biomass in 2005 was around 30.8 million m3/a comprising 13.5 million m3 of saw logs having diameter 20 cm & up and 17.3 million m3 of other biomass, small sized rubber wood. Out of the 13.5 million m3 of saw logs, only around 3.0 million m3 or 22% have been used mainly in the production of sawn wood and veneer. Out of the 17.3 million m3 of other biomass, only a tiny portion has been used mainly in MDF making. The very low rate of utilization is indeed a waste of rubber wood resource in light of the shortage of wood raw material supply and it must be increased to the extent possible considering the availability of wood from sustainable sources, rubber plantations. Therefore, it is imperative to promote the utilization of rubber wood resource in the near future in light of resource availability and the problem facing the national wood industry.

The very low rate of utilization problem is attributable to at least five main causes as briefly discussed below:

- Firstly, the big companies owning large rubber plantations have no interest in utilizing rubber wood they own. The schedule for replacement of old rubber trees practiced by these companies is not compatible with the need for a steady supply of wood raw material to processing mills and is hampering the utilization of rubber wood. The completed pre-project documented that a large company owning a 25,000 Ha of plantation area for instance, does not necessarily replace 1,000 Ha yearly under a 25-year replacement cycle. The common practice is to replace old trees of different ages, say of ages 26 to 30 years, simultaneously in one year mainly for cost efficiency reason. In this case, the company is replacing 5,000 Ha of old trees in one year but only every five years. This replacement schedule is indeed incompatible with the need for a steady supply of raw material wished by any wood processing mill. For technical and economic reasons, it is not possible for a processor to stock rubber wood extracted from 5,000 Ha as raw material for five years time. This schedule incompatibility problem should be resolved by harmonizing the schedules for replacement of old plantations by big companies and for steady supply of wood to processing mills. This schedule harmonization can only be achieved through mutual understanding and cooperation between rubber growers and wood processors for which intensive communication and dialogue is needed and reliable information on potential benefits of utilizing rubber wood biomass must be made available. Apparently, the big companies owning rubber plantations are not aware of the potential benefits of wood utilization. Moreover, they are not required by law to utilize rubber wood thus focus only on latex business. The intention of the project is two folds: to facilitate adjustment of replacement schedule that ensures a steady supply of

wood to processing mills and to initiate cooperation between rubber growing companies and wood processors to invest in rubber wood utilization.

- Secondly, the lack of incentives for and capacity in the utilization of rubber wood by smallholders or farmers has significantly contributed to the low rate of utilization problem. Recall that the bulk of rubber wood biomass is owned by smallholders, scattered in small scale plantations of commonly less that 5 Ha in size with poor infrastructure and low accessibility. Harvesting of this kind of plantation surely is not attractive to owners for a number of reasons. First of all, price of rubber wood is not attractive in the absence of competing local buyers. Secondly, although old, over mature trees, yield only a meager volume of latex, they are at least generating stream of income for the farmers. Also, replacing old trees and replanting is a costly undertaking that requires big amount of cash to purchase inputs. This replanting problem can only be resolved if owning farmers are provided with incentives to replant in the form of income source during the period of no-latex production of newly planted trees and price of seedlings is subsidized by the government like that in Malaysia. To generate income stream during the no-latex production period, planting of rubber trees shall be combined with inter-planting of cash crops that will generate income in the short-term. Therefore, there is a need to establish trial plots to find out most appropriate planting technique and inter-planting mode and to use these plots for training of farmers. Thirdly, even if smallholders are interested in removing old trees, they have no capacity to harvest for having no technical skills in harvesting. Therefore, it is necessary to have the farmers trained in harvesting techniques and in replanting of rubber using appropriate agro-forestry system. In order to create local market for wood, it is indispensable to have processing mills operating in the vicinity of the farmers, plantations. In light of the poor infrastructure, low accessibility, fragmented and small areas, poor quality of boles and vulnerability of rubber wood to blue stain attack there is an urgent need to identify and pilot-test an appropriate processing technology suitable for these conditions.

- Thirdly, there is a problem of weak government policy that does not encourage efficient and sustainable utilization of rubber wood resource. This problem includes lack of policy coordination amongst the authorities concerned, time consuming bureaucratic procedures leading to slow and inefficient processing, absence of incentives and coercion for big companies to utilize rubber wood, lack of incentives for smallholders to replace old trees and lack of appreciation on the potential role of rubber wood in coping with raw material supply problem facing the wood industry. Hence, reviewing and enhancing the existing policies are indispensable if utilization of available rubber wood resource is to be significantly increased.

- The fourth main cause of the problem is the lack of investment in rubber wood utilization brought about by poor and unreliable information on rubber wood resource in terms of quantity, quality and distribution, on markets of products and on appropriate technologies for utilization. This information is useful for not only investors but also for other stakeholders interested in the resource. Reliable information is needed in investment decision making by would be investors and required by authorities at different levels for policy making. Therefore, there is a compelling need to make such information publicly available to attract interest in rubber wood utilization related business. Updated and reliable information on the extent and age classes of rubber plantations, growing stock, quality of wood, distribution, infrastructure and accessibility, on product and quality standards required by markets and on development in the state of processing technologies is indispensable for making investment decision and policy formulation.

- The fifth main cause of the problem relates to availability of appropriate technology. As has been touched somewhere else, bulk of extractable rubber wood resides at smallholding plantations characterized by small area, commonly less than 5 Ha in size, poor infrastructure and low accessibility and low quality of wood due mainly to tapping scars, poor branching and bole form. Producing sawn wood or veneer out of this low quality material is certainly not advisable for low recovery and low quality

reasons. In this light, most feasible option is seemingly to produce sawn timber, veneer and chips wood using portable, movable equipment and facilities combined with drying chamber, container-like located in the vicinity of harvesting areas. The thought is to have big sized logs sawn and peeled while small sized wood chipped in order to optimally utilize available rubber wood. To avoid down grading by blue stain attacks, sawn, peeled and chipped woods must be dried immediately using simple kiln-drying chamber best activated by solar energy. Among the advantages of this envisioned technology are the large markets for sawn wood, veneer and woodchip at reasonable price both in domestic and export markets, relatively adaptable and applicable to poor infrastructure and accessibility situation, can consume low quality wood, require relatively low capital investment and low technological sophistication. This technology is, however, yet to be designed and undergo pilot testing to assess its efficiency, applicability and duplicability.

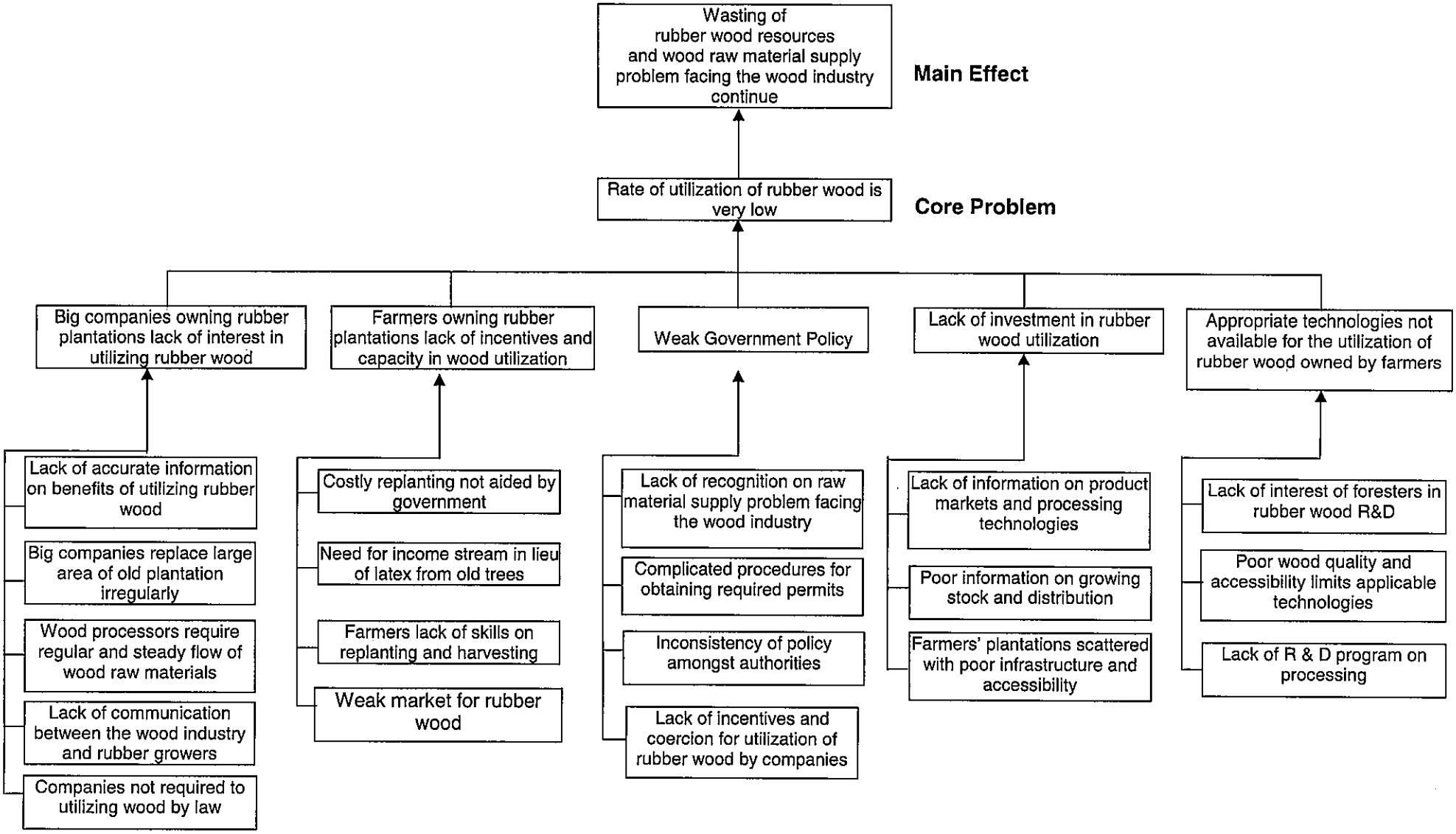
During the implementation of completed pre-project PPD 80/03 Rev. 2 (I), problems facing the utilization of rubber wood resource had been discussed with the main stakeholders at different occasions including in two National Workshops and visits to big companies as well as farmers. Summary of the discussions is presented in the table below.

## Summary of Rubber Wood Stakeholder Analysis

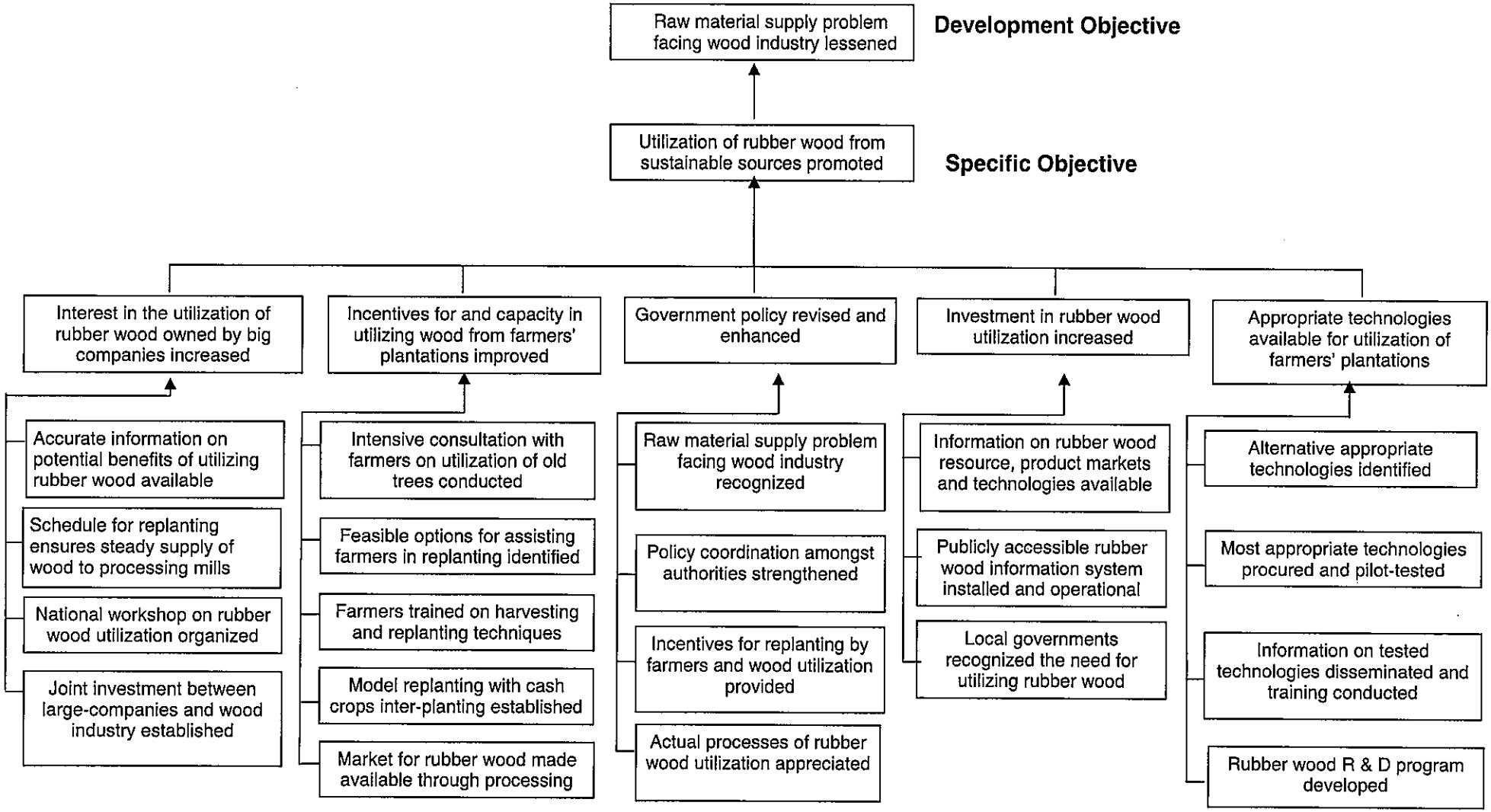
| No | Stakeholder | Role/influence in rubber resource management | Utilization problem raised | Potential involvement in the project |
|---|---|---|---|---|
| 1. | Ministry of Forestry | Level of consumption by the wood industry | Lack of interest in using rubber wood<br><br>Lack of information on benefits and resource base | Government policy formulation<br><br>Facilitating cooperation with rubber growers |
| 2. | Ministry of Trade | Level of exportation<br>Product specifications | Very low export volume<br>Lack of investment<br>Lack of market and technology information | Policy review<br>Policy formulation |
| 3. | Ministry of Agriculture | Extent of plantation<br>Rubber plantation management policy | Rubber trees for latex, wood is by product<br>Lack of utilization and reliable information on smallholding plantations | Management policy formulation<br>Adjustment to schedule of replanting by big companies<br>Policy on wood utilization |
| 4. | Ministry of Industry | Investment licensing | Lack of investment<br>Lack of appropriate technologies | Government policy formulation<br>Promotion of investment |
| 5. | Wood processing companies | Consumer of wood | Weak government policy<br>Lack of information on the resource, product markets and appropriate technologies<br>**Low wood recovery**<br>Lack of incentives to invest | Policy formulation<br><br>Provision of information on demand<br>Execution of trainings<br>User of technologies |

| No | Stakeholder | Role/influence in rubber resource management | Utilization problem raised | Potential involvement in the project |
|---|---|---|---|---|
| 6. | Smallholders, rubber growers | Acquire bulk of rubber wood biomass | Low price of rubber wood<br>**Poor infrastructure**<br>Lack of incentives for replacement of old trees<br>Poor technical skills | Establishment of replanting models<br>Information on real utilization issues<br>Trainees |
| 7. | Big companies owning large rubber plantations | Determine extent of harvest area and supply of rubber wood | Utilization of wood is not required by law<br>Lack of incentives to utilize<br>Low price of rubber wood<br>Low wood recovery | Adjustment of replacement schedule<br>Collaborating with wood industry **for investment**<br>**Source of information** |
| 8. | District governments | Land allocation and tenure<br>Monitoring of plantations | Poor infrastructure and accessibility | Assisting farmers in replanting<br>Facilitating investment<br>Road construction |
| 9. | Universities | Provide education for managers<br>Advising authorities | Lack of professionals<br>Weak government policy<br>Weak data base | Policy formulation<br>**Research & Development**<br>**Farmer trainings** |
| 10. | NGOs | Empowerment of farmers | Weak farmer empowerment program<br>Lack of incentives to replace old trees | Monitoring & evaluation<br>Farmer trainings<br>Establishment of model plantation |

## Problem Tree



## Objective Tree



## 2.2 Intended situation after project completion

Assuming that all planned activities can be implemented timely and properly and outputs achieved, expected situation to prevail after project completion are:

- Mutual understanding between large-scale growers of rubber and wood processors is growing leading to increased joint investment in the utilization of rubber wood biomass;
- Growing interest in replacing old rubber tress and experience in tree harvesting and replanting amongst smallholders;
- Model plantation with cash-crops inter-planting is replicated by smallholders in different areas leading to increased replacement of old plantations;
- Investment in the utilization of rubber wood owned by farmers would have been increased as reliable information on the resource becomes available, local governments pay attention to infrastructure problem and appropriate technologies readily available;
- A rubber wood resource information system would have been operational and publicly accessible;
- Suitable and appropriate technologies for the processing of rubber wood from smallholding plantations would have been tested and available for replication;
- Effected government policy would create healthy and favorable environment for an efficient utilization of rubber wood;
- Government authorities would have appreciated the role of rubber wood in economic development at both local and national levels; and
- The rate of utilization of rubber wood would be higher as evidenced by increasing production of rubber wood products in various forms.

## 2.3 Project Strategy

In order to deliver planned outputs and accomplish the specific objective of the project, the basic strategy to be adopted can be summarized as follows:

- Motivating and convincing
  There is a compelling need to first motivate and convince stakeholders to utilize available rubber wood from sustainable sources. Main target groups are rubber growers, big companies and smallholders, government authorities concerned at central, provincial and district levels, wood processors and investors. To this end, reliable and updated information on potential benefits of utilizing, rubber wood resource in terms of quantity, quality and distribution, on product markets and processing technologies must be made available. The said information will bring about clear understanding on the rationale for rubber wood utilization which in turn will motivate and convince target groups to take part in rubber wood utilization. Expected main outputs of motivating and convincing activities are greater interest amongst rubber growers to replace old trees and utilize wood in a proper manner;

- Improving the enabling conditions
  Existing policies governing rubber wood utilization are less supportive to conduct an efficient utilization of rubber wood resource thus must be reviewed and enhanced. Adoption of enhanced policy on rubber wood utilization that takes into account the natural properties of rubber wood, the plantation settings, efficiency as well as quality of utilization is prerequisite to improving enabling conditions for investment and to building up competitiveness of investors. Therefore, reviewing of existing policies and improving coordination amongst authorities concerned are indispensable for improvement of the enabling conditions for utilization which further will motivate and convince stakeholders to invest in rubber wood resource utilization;

- Equipping for action
  Considering the natural properties of rubber wood and the environment of its utilization, there is a compelling need to introduce appropriate technologies. These technologies must have been pilot tested prior to disseminating to interested parties through trainings. Without these technologies it is hard to imagine how rubber wood from farmers' plantation can be utilized beneficially.

It should be emphasized that: i) utilization of wood from large plantations and that from smallholding plantations must be carried out using different strategies and activities due to the fact that features of the two groups of plantation are considerably different from each other in terms of accessibility, wood quality and perception of owners towards utilization that has been touched upon in Part I; ii) identified activities of the project are those ones relevant for motivating and convincing, improving enabling conditions and equipping interested stakeholders to take action on utilization; iii) the project will focus on promoting rubber wood resource utilization in Sumatra island as more than seventy percent of the plantation is located in this island. Two provinces and four districts, two in each province, will be selected as the project site; and iv) to be successful, the project will have to work closely with government authorities at all levels, with local universities and NGOs, with ISWA members taking advantage of their established network at the project sites and with other forestry associations. **Provinces of Jambi and South Sumatra have been selected as the location of the project as these two provinces alone contain nearly forty percent of national rubber wood growing stock. Two districts in each province will be selected in close consultation with the respective Governors of the provinces as the project sites. The Provinces and tentative Districts are as shown on the Location Map (Annex 4).**

## 2.4 Target Beneficiaries

The primary beneficiaries of the project are the wood industry and rubber growers. The project will benefit these beneficiaries directly and indirectly as follows:

- Larger volume of rubber wood available for processing will reduce the idle installed production capacity, promote processing activities and contribute to local and national economic development;
- Availability of up to date and reliable information on rubber wood resource, product markets and processing technologies will induce stronger interest in investment on rubber wood processing;
- Training of farmers on replanting and harvesting skills is invaluable social capital and shall benefit the farmers in the long run;
- Harvesting of rubber old trees and replanting with cash crops inter-planting by farmers shall improve their income through selling of wood;
- Appropriate processing technologies developed under the project can be easily duplicated by small holders and big companies owning rubber plantations;
- Cooperation between wood industry with large-scale rubber growers will secure supply of wood raw materials and augment income of both parties; and
- Favorable government policy will allow efficient utilization of rubber wood thus stronger competitiveness of the wood industry in global market.

The smallholders or farmers, owners of over 80 percent of removable rubber wood, shall be benefited from the project in various ways including: i) harvesting of old trees and selling of wood to local processors provide additional income; ii) technical skills acquired through trainings create self confidence and capacity to carry out activities on replanting and harvesting; and iii) cash crop inter-planting model plantation generates additional income when properly replicated and managed.

The big companies can enhance their financial performance through sale of harvested rubber wood or through efficient processing. Market for raw harvested wood is strong indeed provided that schedule for harvesting can assure continuous flow of wood to local

processors. Processing of rubber wood can be done either by using own resources or by collaborating with existing wood processors. Selling of processed products will certainly generate profit accruable to the companies thus enhance their financial performance.

The secondary beneficiaries of the project include the Ministries of Forestry, Agriculture, Trade, Industry, Local Governments, Universities and local NGOs, Information on rubber wood resource, product markets and technologies generated by the project to be publicly made available is of utmost important for the Ministries in raising their appreciation on the role the rubber wood resource can play in revitalizing the national wood industry and in decision making concerning efficient utilization. The benefits accruable to Local Governments include availability of information on the dynamics of rubber wood resource base and utilization useful for local policy making and economic development planning.

Universities will have the opportunity to take part in implementation of the project by assigning capable experts and in decision making by advising concerned local and central governments. Local NGOs will also have the chance to assist local farmers and governments in the implementation of activities designed to improve livelihood of local communities.

## 2.5 Technical and Scientific aspects

Rubber tree is planted primarily for latex production. In many tropical countries the wood has been an important source of energy. In Indonesia, bulk volume of harvested wood has been used as fire wood.

Malaysia and Thailand have emerged as the most important processors of rubber wood and exporters of rubber wood products especially furniture parts. In these countries, extensive R&D has been carried out to understand and exploit the full potential of the wood resource efficiently. Over the last few years, rubber wood has been traded in global market under the names of "Malaysian Oak" or "Para Wood". In fact, rubber wood has gained prominence through out the world due to its plantation origin that connotes environment friendly resource and its suitability for sawn timber, molding, furniture, MDF, particle board and pulp & paper.

Rubber wood is a light yellowish color wood with good, strong properties. With an average density of 560 kg per $m^3$, its Modulus of Elasticity (MOE) and Modulus of Rupture (MOR), the two most important strength characteristics, are comparable to that of the common wood materials from natural forest such as *nyatoh, mersawa* and *bintangor*. Rubber wood can be machined easily and the optimum cutting angle for machining is within the range of 18 degrees. Operation such as molding, shaping, turning and boring can be carried out without too much defects. However, the presence of tension wood makes the machined surface prone to manifest "fuzzy grain" while latex in the wood may clog up cutting tools in some high speed applications (ISWA & ITTO, 2006).

Kiln drying of rubber wood is usually carried out using a drying schedule, which quite comparable to that of *light meranti*. Drying time is about 10 to 12 days for 50 mm boards. Rubber wood is prone to wrapping and end checks during drying which is attributable to the presence of tension wood and interlocking grains. The average loss due to drying is in the range of 5 to 8 percent of volume.

Perhaps, the biggest drawback of rubber wood as a raw material is its low durability as the wood is very prone to biodegradation. Blue stain fungal attack is the biggest menace of the wood in wet state while powder-post beetle attacks are critical in dry state of the wood. The high starch content in the wood renders the high susceptibility to biodegradation. However, rubber wood can be easily treated with wood preservatives as the result of its medium to coarse grain texture. The most common preservative used is boron boric acid (BBA) compound which usually applied using vacuum pressure technique. Other preservative such as synthetic pyrethroids is also being used increasingly but its application is rather limited due to higher cost (ISWA & ITTO, 2006).

On average, Indonesian rubber woods have high content of *holosellulose*, low content of *lignin* and high content of extracts. In terms of *holosellulose* and *lignin* content, rubber wood is suitable for pulp making but expensive due to the high extract. To date, little has been done in Indonesia in R&D of rubber wood; more reliable information on chemical and mechanical properties of rubber wood is still needed to support its usage as the raw materials for commercial such products as MDF, pulp & paper and particle board (FORDA & MITI, 2001).

## 2.6 Economic aspects

The project is designed to promote an efficient utilization of larger volume of rubber wood biomass obtained from the replacement of old rubber trees owned by big companies and smallholders. Processing larger volume of rubber wood will bring about: i) increased utilization of idle installed processing capacity which means reducing cost of capital; ii) larger input requirements in terms of labor, non-wood materials and working capital all of which will accelerate growth of local economies.

**It was mentioned in Part I that around 13.5 million m3 of saw logs, logs with diameter 20 cm and up, are harvestable every year in a sustainable manner. Assuming that around 70% of this volume could be actually used by the wood industry as raw material, the economic impacts would be enormous as follows:**

- **Increased supply of rubber wood logs to the wood industry in the order of 10 million m3/a could significantly raise the capacity utilization rate (CUR) in the sawmilling and ply milling sectors. Installed production capacity of these sectors is currently over 20 million m3 and only around 40 percent is utilized due to the lack of wood supply. Additional supply of logs at 10 million m3 could raise the CUR to 60 percent which is a substantial economic gain in terms of reduced cost of idle capacity;**

- **Potentially, the 10 million m3 saw logs could be converted to around 2.5 million m3 of sawn timber that could be sold in domestic market at US$ 200/m3; this translates to around US$ 500 million of income per year of which around US$ 250 million are accruable to rubber farmers as receipt from selling rubber logs.**

**It was estimated by completed Pre-project PD 80/03 Rev. 2 (I) that around 17 million m3 of rubber wood biomass, wood with diameter less than 20 cm, is harvestable per year from rubber plantations. Assuming that 60 percent of the biomass or around 10 million m3 could actually be chipped to produce around 8 million m3 of chip wood, the financial impact would be immense. Selling the chip wood at US$ 35 per m3 would generate income of around US$ 280 million per year of which around US$ 140 are accruable to rubber growers as payment by processors for wood raw material.**

Introduction of appropriate technologies and implementation of technical trainings in harvesting, planting and processing shall result in: i) improved efficiency of utilization that allows production of larger value added; and ii) growing interest in harvesting old trees by smallholders that means securing steady and larger quantity of rubber wood to local processors and raising income of farmers through wood selling. Moreover, establishment of model plantation with cash-crops inter-planting is expected to demonstrate how farmers' income can be generated during the no-latex production of young trees which in turn will attract larger number of farmers to replace old trees without losing source of income.

Improved business environment shall develop through implementation of improved government policy which allows for fast utilization processes, provide incentives for farmers to replace old, low productivity rubber trees and facilitates exportation of high value added products. Moreover, improved government policy will facilitate the building up of stronger competitiveness of Indonesian exporters in the global market of rubber wood products currently dominated by Malaysian and Thailand exporters.

In short, implementation of the project will positively affect local and national economies and shall contribute significantly to GDP.

## 2.7 Environmental aspects

The project concerns with the promotion of efficient utilization of rubber wood from planted rubber trees, thus activities involved should not be harmful to environment. Harvesting is to be carried out in small blocks and tiny lots of plantation which will produce tolerable level of soil erosion. **It should be emphasized that rubber plantations in Indonesia, by and large, occupy lands with flat, undulating and lightly sloped topography; this topography condition also contributes to the low level of soil erosion.** Processing activities are to be performed at the sites having fair distance with settlements thus should not be dangerous to local people.

Application of chemical preservatives to prevent *blue stains* and *beetle powder* is, however inevitable. In this case stringent criteria will be applied in the selection of preservatives in order to minimize adverse effect to environment. **The criteria to be applied are in accordance with the Ministry of Agriculture Decree No. 434.1 of 2001. In essence, this decree requires that chemical preservatives that can be used in agricultural sector including forestry, must meet several conditions including i) that the preservatives are registered with the Ministry of Agriculture for storage, distribution and use; ii) that the use of the preservatives have been tested by authorized R & D Institute and meet the technical and safety requirements; and iii) preservatives under trial stage cannot be used publicly or by agricultural business sector.**

**The decree further lists chemical preservatives that are safe and effective to use in attacking blue stain and beetle powder, e. g basiblue 100 EC, celbrite 300 WSC, hylite 150 EC, impralit SP, basileum 505 EC and impralit CKB. The preservatives to be used by the project will be chosen from the list issued by the Ministry of Agriculture based on availability, price and experience in using a preservative by other users.**

## 2.8 Social aspects

The project is designed to increase participation of rubber growers and wood processors in utilization of available, untapped rubber wood resource. Increased utilization of rubber wood will create job opportunities and accelerate growth of local economies and, to a lesser extent, national economy. To facilitate increased participation, rubber growers and wood processors will be empowered by the project through conduct of relevant trainings. Increased participation should increase income thus raise level of welfare of local people in general. Therefore, no adverse effect of the project on social life is foreseen. In fact the project should improve social vitality and economic viability of participating small communities in the mid to long-terms provided that an efficient utilization of rubber wood can be sustained.

## 2.9 Risks

Potential risks of the project that are foreseeable include slow process and late adoption of revised government policy, uncooperativeness of farmers and big companies owning rubber plantations, unavailability of international consultants in time and unsuccessful introduction of appropriate technologies.

Historically, policy making process in Indonesia is progressing slowly especially when the process involves different ministries and levels of government. Four Ministries are involved in policy making regarding rubber wood utilization, namely Ministry of Forestry is responsible for securing supply of wood raw materials to feed the wood industry, Ministry of Agriculture is responsible for directing the management of rubber plantations, Ministry of Trade is responsible for development of technical specifications for and legality of the wood products exported as well as exporting procedures and Ministry of Industry is in charge of licensing investment and importing machinery and processing facilities. Therefore, coordination between these Ministries is truly a big challenge. To speed up policy making process, intensive consultation, dialogue and lobbying shall be undertaken since the early stage of

project implementation. This will be the responsibility of the executives of ISWA and Other Forestry Associations like APKINDO, APHI and ASMINDO.

To gain cooperative attitude of the rubber growers, motivating and convincing activities have to be initiated from the very beginning. Intensive consultation and dialogue with big companies will be undertaken by ISWA Executives and MOF officials since the early stage of project implementation for which reliable information on the potential benefits of rubber wood utilization should be made available. To ensure cooperation by smallholders, there is a need to conduct intensive consultation. During this consultation, expectations of farmers shall be documented and the benefits of harvesting old trees will be elaborated realistically. Also model plantation with cash-crops inter-planting shall be established based on this consultation which shall commence at the earliest.

Experienced professional in rubber wood processing is extremely scarce in Indonesia. Therefore, the project has to rely on expatriate professionals from Malaysia, Thailand, China and India to execute selected activities. As Malaysia is the main competitor, it might not be easy to hire Malaysian professionals, leaving only three countries as the source of expertise. To ensure availability of professionals to implement relevant activities in time, there is a need to start searching for potential professionals since the early stage of implementation with the assistance of ITTO Secretariat.

To ensure the success introduction of appropriate technologies, highly competence International Consultant should be employed. He or she must have acquired excellent experience in rubber wood processing and innovated technologies in the field. One of the candidates that meet the qualifications is Mr. Jayabhanu of India, subject to availability and approval by ITTO.

## 3. Outputs

The project will deliver five outputs through execution of twenty two activities in order to accomplish the specific objective and contribute meaningfully to the development objective "to contribute to the lessening of wood raw material supply problem facing the national forest industry by utilizing the vast rubber wood available from sustainable sources".

The specific objective of the project is to promote the utilization of rubber wood from sustainable sources. Planned outputs are:

Output 1 : Interest in the utilization of rubber wood owned by big companies increased.

Output 2 : Incentives for and capacity in the utilization of wood from smallholding plantations improved.

Output 3 : Government policy governing rubber wood resource utilization revised and enhanced.

Output 4 : Investment in rubber wood utilization increased.

Output 5 : Appropriate technologies are available for the utilization of rubber wood from smallholding plantations.

## 4. Activities

Output 1 : Interest in the utilization of rubber wood owned by big companies increased.

Activity 1.1 : To provide reliable information on potential benefits of utilizing rubber wood owned by big companies.

Activity 1.2 : To facilitate intensive dialogue between large-scale rubber tree growers and the wood industry for adjustment of replanting schedule by big companies to ensure steady supply of wood to processing mills.

Activity 1.3 : To organize one national workshop on rubber wood utilization involving main stakeholders.

Activity 1.4 : To facilitate establishment of joint investment between rubber growers and wood processors in rubber wood utilization.

Output 2 : Incentives for and capacity in the utilization of wood from farmers' plantations improved.

Activity 2.1 : To provide reliable information on potential benefits of utilizing rubber wood owned by farmers.

Activity 2.2 : To carry out intensive consultation with farmers regarding requirements for and impacts of rubber wood utilization on farmers' livelihood.

Activity 2.3 : To establish models plantation with cash-crops inter-planting for demonstration and training of farmers (4 sites, total 20 Ha).

Activity 2.4 : To train farmers on efficient techniques for replanting and harvesting of old trees (4 trainings, 80 trainees).

Activity 2.5 : To identify feasible options for adoption by local governments to assist farmers in replanting of rubber.

Output 3 : Government policy governing rubber wood resource utilization revised and enhanced.

Activity 3.1 : To review the existing laws, rules and regulations on rubber wood utilization.

Activity 3.2 : To formulate a new policy that encourages efficient utilization of rubber wood resource.

Activity 3.3 : To organize one national workshop on the new policy involving main stakeholders.

Activity 3.4 : To establish coordinating mechanisms of rubber wood resource utilization at different levels of government.

Activity 3.5 : To submit the new policy to the government for adoption.

Output 4 : Investment in rubber wood utilization increased.

Activity 4.1 : To provide and disseminate up-dated information on rubber wood growing stock, product markets and processing technologies from primary and secondary sources.

Activity 4.2 : To conduct field surveys at four selected sites on growing stock of farmers' rubber plantations and update map of plantations in Sumatra.

Activity 4.3 : To organize two regional workshops on investment in rubber wood resource utilization and its potential role in economic development.

Activity 4.4 : To install and operate a publicly accessible rubber wood information system.

Output 5 : Appropriate technologies are available for the utilization of rubber wood from smallholding plantations.

Activity 5.1 : To identify alternative technologies and select most promising alternative.

Activity 5.2 : To procure, install and pilot test equipment and facilities for sawing, peeling, chipping and kiln-drying.

Activity 5.3 : To publish and disseminate information on pilot-tested technologies and conduct two trainings for rubber growers, investors and local government staffs.

Activity 5.4 : To develop a R&D program on rubber wood resource utilization in collaboration with main stakeholders.

## 5. Logical Framework

| *Project Elements* | *Indicators* | *Means of verification* | *Assumptions* |
|---|---|---|---|
| **Development Objective**<br><br>To contribute to the lessening of wood raw material supply problem facing the national wood industry | Reduced gap between supply of and demand for wood raw materials | Annual reports of Ministries of Forestry and Industry | Supportive stakeholders |
| **Specific objective**<br><br>To promote the utilization of rubber wood from sustainable sources. | Production of rubber wood products increased by 10% by end of year 3<br><br>5 to 10 investors apply for investment permit by end of year 3 | Ministries' and ISWA reports<br><br>Reports of the Ministries of Forestry and Industry and ISWA | Supportive government policy effected<br><br>Rubber growers positive attitude |
| **Outputs**<br><br>Output 1 :<br><br>Interest in the utilization of rubber wood owned by big companies increased | Reliable information on rubber wood utilization available<br><br>Exchange of information took place through meetings and discussions<br>Adjusted replanting schedule ensuring steady supply of wood to processors adopted by big companies<br>One national workshop organized | Report of Consultant<br><br>Minutes of meetings<br><br>Document of adjusted schedule<br><br>Report on workshop | Competent consultant available<br>Cooperativeness of big rubber growers<br>Political support by the government |
| Output 2 :<br>Incentives for and interest in the utilization of wood from farmers' plantations increased | Reliable information on utilization of farmers' rubber wood available<br>Intensive consultation with rubber farmers conducted<br>Models of plantation with cash crops inter-planting established at 4 sites totaling 20 Ha<br>At least 80 farmers trained on planting and harvesting skills at 4 sites | Report of consultant<br><br>Consultation document<br>Field inspection, report of consultant<br><br>Training reports | Farmers are cooperative<br><br>Competent consultant available in time<br>Professional trainers available in time |
| Output 3<br>Government policy governing rubber wood resource utilization revised and enhanced | Revised policy document formulated and disseminated<br><br>One national workshop on revised policy organized | Reports of Consultant<br>Minutes of consultative meetings<br>Report on workshop<br>Policy document | Supportive stakeholders<br>Political will of the government continues |

| *Project Elements* | *Indicators* | *Means of verification* | *Assumptions* |
|---|---|---|---|
| Output 4 :<br>Investment in rubber wood utilization increased | Updated and reliable information on resource, product market and technologies available<br>Growing stock surveys carried out at 4 sites in Sumatra<br>5 to 10 investors apply for investment permit by end of year 3<br>Rubber wood data base system operational<br>Two regional workshops organized | Report of consultant<br>Updated map of plantations<br>Field survey reports on growing stock<br>Application documents<br><br>Report of Consultant<br>Field check<br>Proceedings | National consultant and surveyors available in time<br><br>Regional and local governments cooperative |
| Output 5<br>Appropriate technologies are available for the utilization of rubber wood from smallholding plantations | One set of equipment and facilities for sawing, peeling, chipping and drying procured and pilot tested at one site in Sumatra<br>Information on tested technologies published and disseminated<br>Two training workshops on appropriate technologies with 40 participants conducted at two sites | Consultant report<br>Technical design of technologies<br><br>Technical manual of technologies<br><br>Training workshop report | International Consultant available in time<br><br>The technologies interest stakeholders |

## 6. Work plan

| Outputs and Activities | Resp. Party | Year 1 | | | | Year 2 | | | | Year 3 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| **Output 1:** Interest in the utilization of rubber wood owned by big companies increased. | | | | | | | | | | | | | |
| Activity 1.1. To provide reliable information on potential benefits of utilizing rubber wood owned by big companies. | PIU ; IC | | | | | | | | | | | | |
| Activity 1.2. To facilitate intensive dialogue for adjustment of replanting schedule by big companies to ensure steady supply of wood to processing mills | EA | | | | | | | | | | | | |
| Activity 1.3. To organize one national workshop on rubber wood utilization involving main stakeholders | PIU ; PEO | | | | | | | | | | | | |
| Activity 1.4. To facilitate establishment of joint investment between rubber growers and wood processors in rubber wood utilization | EA | | | | | | | | | | | | |
| **Output 2:** Incentives for and capacity in the utilization of wood from smallholding plantations improved. | | | | | | | | | | | | | |
| Activity 2.1. To provide reliable information on potential benefits of and constrains to utilizing rubber wood owned by farmers | PIU ; NC | | | | | | | | | | | | |
| Activity 2.2. To carryout intensive consultation with farmers regarding requirements for and impacts of rubber wood utilization on farmers' livelihood | PIU ; NC | | | | | | | | | | | | |
| Activity 2.3. To establish models plantation with cash-crops inter-planting for demonstration and training of farmers (4 sites, total 20 Ha) | PIU ; NC | | | | | | | | | | | | |
| Activity 2.4. To train farmers on efficient techniques for replanting and harvesting of old trees (4 trainings, 80 trainees). | PIU ; PT | | | | | | | | | | | | |
| Activity 2.5. To identify feasible options for local governments to adopt in assisting farmers in rubber replanting | PIU ; NC | | | | | | | | | | | | |
| **Output 3:** Government policy governing rubber wood resource utilization revised and enhanced. | | | | | | | | | | | | | |
| Activity 3.1. To review existing laws, rules and regulations on rubber wood utilization | PIU ; NC | | | | | | | | | | | | |
| Activity 3.2. To formulate a new policy that encourages efficient utilization of rubber wood resource. | PIU ; NC | | | | | | | | | | | | |
| Activity 3.3. To organize one national workshop on the new policy involving main stakeholders | PIU ; PEO | | | | | | | | | | | | |

## Work plan (Continued...)

| Outputs and Activities | Resp. Party | Year 1 | | | | Year 2 | | | | Year 3 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| Activity 3.4. To establish coordinating mechanisms for rubber wood resource utilization at different levels of government | PIU | | | | | | | | | | | | |
| Activity 3.5 To submit the new policy to the government for adoption | EA | | | | | | | | | | | | |
| **Output 4:** Investment in rubber wood utilization increased. | | | | | | | | | | | | | |
| Activity 4.1. To provide and disseminate up-dated and reliable information on rubber wood growing stock, product markets and processing technologies | PIU ; NC | | | | | | | | | | | | |
| Activity 4.2. To conduct field surveys on growing stock of farmers' rubber plantations at four sites and produce updated map of plantations in Sumatra Island | PIU ; NC | | | | | | | | | | | | |
| Activity 4.3. To organize two regional workshops on investment in rubber wood resource utilization and its role in economic development | PIU ; PEO | | | | | | | | | | | | |
| Activity 4.4. To install and operate a publicly accessible rubber wood information system | PIU ; NC | | | | | | | | | | | | |
| **Output 5:** Appropriate technologies are available for the utilization of rubber wood from farmer's plantations | | | | | | | | | | | | | |
| Activity 5.1. To identify alternative technologies and select most promising alternative | PIU ; IC | | | | | | | | | | | | |
| Activity 5.2. To procure, install and pilot test of equipment and facilities | PIU ; IC | | | | | | | | | | | | |
| Activity 5.3. To publish and disseminate information on tested technologies and conduct two trainings for rubber growers, investors and government staffs | PIU ; IC ; NC | | | | | | | | | | | | |
| Activity 5.4 To develop a R&D program on rubber wood resource utilization in collaboration with main stakeholders | PIU ; NC | | | | | | | | | | | | |

**Notes:**

EA : Executive Agency
IC : International Consultant
PEO : Professional Event Organizer
PIU : Project Implementing Unit
NC : National Consultant
PT : Professional Trainer

## 7. Budget

## 7. 1. Worksheet of Budget Component

| Output and Activities | | Inputs | Unit | Quantity | | Unit Cost (US $) | Quarter Year | Budget Compo-nent | Total | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | ITTO | GOI | | | | ITTO | GOI | |
| 1 | | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| **Output 1. Interest in the utilization of rubber wood owned by big companies increased** | | | | | | | | | | | |
| Activity 1.1. To provide reliable information on potential benefits of utilizing rubber wood owned by big companies | 1 | National Consultant | MM | 1.5 | 0 | 1,500 | Q1-Q2, Y1 | 15 | 2,250 | 0 | 2,250 |
| | 2 | DSA, NC | MD | 20 | 0 | 60 | | 35 | 1,200 | 0 | 1,200 |
| | 3 | Domestic air tickets | Trip | 2 | 0 | 200 | | 32 | 400 | 0 | 400 |
| | 4 | Local Transport | Trip | 1 | 1 | 300 | | 33 | 300 | 300 | 600 |
| | 5 | Miscellaneous | - | 0.5 | 0.5 | 600 | | 64 | 300 | 300 | 600 |
| **Total Activity 1.1** | | | | | | | | | **4,450** | **600** | **5,050** |
| Activity 1.2. To facilitate intensive dialogue for adjustment of replanting schedule by big companies to ensure steady supply of wood to processing mills | Executives & Gov. Officials, 6 persons | | | | | | Q2-Q3, Y1 | | | | |
| | 1 | Domestic air tickets | Trip | 2 | 1 | 1800 | | 32 | 3,600 | 1,800 | 5,400 |
| | 2 | DSA, 3 days/trip | MD | 36 | 18 | 60 | | 35 | 2,160 | 1,080 | 3,240 |
| | 3 | Local Transport | Trip | 0 | 3 | 300 | | 33 | 0 | 900 | 900 |
| | 4 | Miscellaneous | - | 1 | 0 | 600 | | 64 | 600 | 0 | 600 |
| **Total Activity 1.2** | | | | | | | | | **6,360** | **3,780** | **10,140** |
| Activity 1.3. To organize one national workshop on rubber wood utilization involving main stakeholders | 1 | Professional event organizer | Package | 1 | 0 | 14,000 | Q3-Q4, Y1 | 23 | 14,000 | 0 | 14,000 |
| | 2 | 10 special participants: | | | | | | | | | |
| | | - Air tickets | Trip | 1 | 0 | 2000 | | 32 | 2,000 | 0 | 2,000 |
| | | - DSA | MD | 30 | 0 | 60 | | 35 | 1,800 | 0 | 1,800 |
| | 3 | Consumable items | - | 1 | 0 | 600 | | 51 | 600 | 0 | 600 |
| | 4 | Miscellaneous | - | 0 | 1 | 600 | | 64 | 0 | 600 | 600 |
| **Total Activity 1.3** | | | | | | | | | **18,400** | **600** | **19,000** |
| Activity 1.4. To facilitate establishment of joint investment between rubber growers and wood processors in rubber wood utilization | - Executives, 6 persons | | | | | | Q1-Q4, Y2-Y3 | | - | - | - |
| | 1 | Air tickets | Trip | 0 | 2 | 1,800 | | 32 | 0 | 3,600 | **3,600** |
| | 2 | DSA, 3 days/trip | MD | 0 | 12 | 60 | | 35 | 0 | 720 | **720** |
| **Total Activity 1.4** | | | | | | | | | **0** | **4320** | **4320** |
| **Total Output 1** | | | | | | | | | **29,210** | **9,300** | **38,510** |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Output 2. Incentives for and capacity in the utilization of wood from smallholding plantations improved** | | | | | | | | | | | |
| Activity 2.1. To provide reliable information on benefits of and constraints to utilizing rubber wood owned by farmers | 1 | National Consultant | MM | 2 | 0 | 1,500 | Q1-Q2 Y1 | 21 | 3,000 | 0 | 3,000 |
| | 2 | Air tickets | trip | 4 | 0 | 200 | | 32 | 800 | 0 | 800 |
| | 3 | DSA, @ 7 days | MD | 28 | 0 | 60 | | 35 | 1,680 | 0 | 1,680 |
| | 4 | Local Transport | Trip | 3 | 1 | 300 | | 33 | 900 | 300 | 1,200 |
| | 5 | Consumable items | - | 0 | 1 | 600 | | 51 | 0 | 600 | 600 |
| | 6 | Miscellaneous | - | 0.5 | 0.5 | 800 | | 64 | 400 | 400 | 800 |
| **Total Activity 2.1.** | | | | | | | | | **6,780** | **1,300** | **8,080** |
| Activity 2.2. To carry out intensive consultation with farmers regarding requirements for and impacts of rubber wood utilization on farmers' livelihood | 1 | National Consultant | MM | 2 | 0 | 1,500 | Q2-Q3 Y1 | 21 | 3,000 | 0 | 3,000 |
| | 2 | Air tickets | trip | 4 | 0 | 200 | | 32 | 800 | 0 | 800 |
| | 3 | DSA, @ 5 days | MD | 20 | 0 | 60 | | 35 | 1,200 | 0 | 1,200 |
| | 4 | Local Transport | Trip | 2 | 2 | 300 | | 33 | 600 | 600 | 1,200 |
| | 5 | Consumable items | - | 0.5 | 0.5 | 400 | | 51 | 200 | 200 | 400 |
| | 6 | Miscellaneous | - | 0.667 | 0.333 | 600 | | 64 | 400 | 200 | 600 |
| **Total Activity 2.2** | | | | | | | | | **6,200** | **1,000** | **7,200** |
| Activity 2.3. To establish models plantation with cash-crops inter-planting for demonstration and training of farmers (4 sites, total 20 Ha). | 1 | National Consultant | MM | 3 | 0 | 1,500 | Q3-Q4, Y1 | 21 | 4,500 | 0 | 4,500 |
| | 2 | Air tickets | Trip | 4 | 0 | 200 | Q1-Q4 | 32 | 800 | 0 | 800 |
| | 3 | DSA @ 10 days/trip | MD | 40 | 0 | 60 | Y2 | 35 | 2,400 | 0 | 2,400 |
| | 4 | DSA farmers/trainers | MD | 40 | 0 | 20 | | 36 | 800 | 0 | 800 |
| | 5 | Laborers, daily wages | MD | 0 | 400 | 7.5 | | 14 | 0 | 3000 | 3,000 |
| | 6 | Local Transport | Trip | 2 | 2 | 300 | | 33 | 600 | 600 | 1,200 |
| | 7 | Consumable items | sites | 4 | 0 | 1,500 | | 51 | 6,000 | 0 | 6,000 |
| | 8 | Miscellaneous | - | 0.5 | 0.5 | 600 | | 64 | 300 | 300 | 600 |
| **Total Activity 2.3.** | | | | | | | | | **15,400** | **3,900** | **19,300** |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Activity 2.4. To train farmers on efficient techniques for replanting and harvesting of old trees (4 trainings, 80 trainees). | 1 | Professional trainers | MD | 60 | 0 | 100 | Q1-Q4 | 22 | 6,000 | 0 | 6,000 |
| | 2 | Training room | Room | 3 | 1 | 500 | Y2-Y3 | 55 | 1,500 | 500 | 2,000 |
| | 3 | DSA, 80 farmers /trainers @ 6 Days | MD | 480 | 0 | 30 | | 36 | 14,400 | 0 | 14,400 |
| | 4 | Air tickets | Trip | 4 | 0 | 200 | | 32 | 800 | 0 | 800 |
| | 5 | Local Transport | Trip | 0 | 4 | 300 | | 33 | 0 | 1200 | 1,200 |
| | 6 | Training facilities | Set | 4 | 0 | 750 | | 63 | 3,000 | 0 | 3,000 |
| | 7 | Consumable items | - | 0.8 | 0.2 | 2,500 | | 51 | 2,000 | 500 | 2,500 |
| | 8 | Miscellaneous | - | 0.667 | 0.333 | 1,500 | | 64 | 1,000 | 500 | 1,500 |
| **Total Activity 2.4** | | | | | | | | | **28,700** | **2,700** | **31,400** |
| Activity 2.5. To identify feasible options for local governments to adopt in assisting farmers in rubber replanting | 1 | National Consultant | MM | 1 | 0 | 1500 | Q2-Q3 Y1 | 21 | 1,500 | 0 | 1,500 |
| | 2 | Air tickets | Trip | 4 | 0 | 200 | | 32 | 800 | 0 | 800 |
| | 3 | DSA, @ 5 days | MD | 20 | 0 | 60 | | 35 | 1,200 | 0 | 1,200 |
| | 4 | Local Transport | Trip | 2 | 2 | 300 | | 33 | 600 | 600 | 1,200 |
| | 5 | Miscellaneous | - | 0.5 | 0.5 | 1,600 | | 64 | 800 | 800 | 1,600 |
| **Total Activity 2.5** | | | | | | | | | **4,900** | **1,400** | **6,300** |
| **Total Output 2** | | | | | | | | | **61,980** | **10,300** | **72,280** |
| **Output 3. Government policy governing rubber wood resource utilization revised and enhanced** | | | | | | | | | | | |
| Activity 3.1. To review existing laws, rules and regulations on rubber wood utilization | 1 | National Consultant | MM | 1.5 | 0 | 1,500 | Q1-Q2, Y1 | 21 | 2,250 | 0 | 2,250 |
| | 2 | Consumable items | - | - | - | 600 | | 51 | 600 | - | 600 |
| | 3 | Miscellaneous | - | - | - | 600 | | 64 | 300 | 300 | 600 |
| **Total Activity 3.1** | | | | | | | | | **3,150** | **300** | **3,450** |
| Activity 3.2. To formulate a new policy that encourages efficient utilization of rubber wood resource. | 1 | National Consultant | MM | 1 | 0 | 1500 | Q2-Q3 Y1 | 21 | 1,500 | 0 | 1,500 |
| | 2 | Miscellaneous | - | - | - | 800 | | 64 | - | 800 | 800 |
| **Total Activity 3.2** | | | | | | | | | **1,500** | **800** | **2,300** |
| Activity 3.3. To organize one national workshop on the new policy involving main stakeholders | 1 | Professional event organizer | Package | 1 | 0 | 14,000 | Q3-Q4, Y1 | 23 | 14,000 | 0 | 14,000 |
| | 2 | Air tickets, 10 persons | Trip | 1 | 0 | 2,000 | | 32 | 2,000 | 0 | 2,000 |
| | 3 | DSA | MD | 30 | 0 | 60 | | 35 | 1,800 | 0 | 1,800 |
| | 4 | Consumable items | - | 1 | - | 500 | | 51 | 500 | - | 500 |
| | 5 | Miscellaneous | - | - | 1 | 600 | | 64 | - | 600 | 600 |
| **Total Activity 3.3** | | | | | | | | | **18,300** | **600** | **18,900** |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Activity 3.4. To establish coordinating mechanisms for rubber wood resource utilization at different levels of government | 1 | Consultation with authorities | Session | 3 | 2 | 600 | Q1-Q2 Y2 | 62 | 1,800 | 1,200 | 3,000 |
| | 2 | Air tickets for 4 persons | Trip | 3 | 0 | 800 | | 32 | 2,400 | 0 | 2,400 |
| | **3** | **DSA, 4 persons @ 3 days** | **MD** | **36** | **0** | **60** | | **37** | **2,160** | **0** | **2,160** |
| | **4** | **Local transport** | **Trip** | **0** | **3** | **300** | | **33** | **0** | **900** | **900** |
| | **5** | **Miscellaneous** | **-** | **-** | **-** | **800** | | **64** | **800** | **0** | **800** |
| **Total Activity 3.4** | | | | | | | | | **7,160** | **2,100** | **9,260** |
| Activity 3.5 To submit the new policy to the government for adoption | 1 | Consultation | Session | 0 | 3 | 500 | Q1-Q2 | 62 | 0 | 1,500 | 1,500 |
| | 2 | Miscellaneous | - | 1 | - | 600 | Y2 | 64 | 600 | 0 | 600 |
| **Total Activity 3.5** | | | | | | | | | **600** | **1,500** | **2,100** |
| **Total output 3** | | | | | | | | | **30,710** | **5,300** | **36,010** |
| **Output 4. Investment in rubber wood utilization increased** | | | | | | | | | | | |
| Activity 4.1. To provide and disseminate up-dated and reliable information on rubber wood growing stock, product markets and processing technologies | 1 | National Consultant | MM | 2 | 0 | 1500 | Q3-Q4 Y1 | 21 | 3,000 | 0 | 3,000 |
| | 2 | Air tickets | Trip | 2 | 0 | 200 | Q1-Q4 | 32 | 400 | 0 | 400 |
| | 3 | DSA, @ 10 days | MD | 20 | 0 | 60 | Y2-Y3 | 35 | 1,200 | 0 | 1,200 |
| | 4 | Local Transport | Trip | 1 | 1 | 400 | | 33 | 400 | 400 | 800 |
| | 5 | Consumable items | - | 0.5 | 0.5 | 400 | | 51 | 200 | 200 | 400 |
| | 6 | Miscellaneous | - | - | - | 700 | | 64 | 400 | 300 | 700 |
| **Total Activity 4.1** | | | | | | | | | **5,600** | **900** | **6,500** |
| Activity 4.2. To conduct field surveys on growing stock of farmers' rubber plantations at four sites and produce updated map of plantations in Sumatra Island | 1 | National Consultant | MM | 3 | 0 | 1,500 | Q3-Q4, Y1 | 21 | 4,500 | 0 | 4,500 |
| | 2 | Air tickets | Trip | 4 | 0 | 200 | Q1-Q4 | 32 | 800 | 0 | 800 |
| | 3 | DSA, @ 15 days | MD | 60 | 0 | 60 | Y2 | 35 | 3,600 | 0 | 3,600 |
| | 4 | Local Transport | Trip | 2 | 2 | 400 | | 33 | 800 | 800 | 1,600 |
| | 5 | Laborers | MD | 0 | 240 | 7.5 | | 14 | 0 | 1800 | 1,800 |
| | 6 | Map publisher | Copies | 200 | 0 | 25 | | 24 | 5,000 | 0 | 5,000 |
| | 7 | Consumables | Package | 4 | 0 | 600 | | 51 | 2,400 | 0 | 2,400 |
| **Total Activity 4.2** | | | | | | | | | **17,100** | **2,600** | **19,700** |
| Activity 4.3. To organize two regional workshops on investment in rubber wood resource utilization and its role in economic development | 1 | Professional event organizer | Package | 2 | 0 | 14,000 | Q1-Q2, Y2-Y3 | 23 | 28,000 | 0 | 28,000 |
| | 4 | Miscellaneous | - | - | - | 600 | | 64 | 400 | 200 | 600 |
| **Total Activity 4.3** | | | | | | | | | **28,400** | **200** | **28,600** |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Activity 4.4 To install and operate a publicly accessible rubber wood information system | 1 | National Consultant | MM | 2 | 0 | 1,500 | Q1-Q4 | 21 | 3,000 | 0 | 3,000 |
| | 2 | PC and facilities | Unit | 2 | 1 | 2,500 | Y1Y2Y3 | 41 | 5,000 | 2500 | 7,500 |
| | 3 | Miscellaneous | - | - | - | 600 | | 64 | 400 | 200 | 600 |
| **Total Activity 4.4** | | | | | | | | | **8,400** | **2,700** | **11,100** |
| **Total Output 4** | | | | | | | | | **59,500** | **6,400** | **65,900** |
| **Output 5. Appropriate technologies are available for the utilization of rubber wood from smallholding plantations** | | | | | | | | | | | |
| Activity 5.1. To identify alternative technologies and select most promising alternative | 1 | National consultant | MM | 1 | 0 | 1,500 | Q1-Q2 | 15 | 1,500 | 0 | 1,500 |
| | 2 | Domestic air ticket | Trip | 4 | 0 | 200 | | 32 | 800 | 0 | 800 |
| | 3 | DSA, NC | MD | 10 | 0 | 60 | | 35 | 600 | 0 | 600 |
| | 4 | Local transport | Trip | 2 | 2 | 300 | | 33 | 600 | 600 | 1,200 |
| | 5 | Miscellaneous | - | - | - | 600 | | 64 | 300 | 300 | 600 |
| **Total Activity 5.1** | | | | | | | | | **3,800** | **900** | **4,700** |
| Activity 5.2. To procure, install and pilot test of equipment and facilities | 1 | International Consultant | MM | 2 | 0 | 10000 | Q2-Q3, Y1 | 15 | 20,000 | 0 | 20,000 |
| | 2 | International air ticket | Trip | 1 | 0 | 2000 | | 31 | 2,000 | 0 | 2,000 |
| | 3 | Domestic air ticket | Trip | 2 | 0 | 200 | | 32 | 400 | 0 | 400 |
| | 4 | DSA,IC | MD | 60 | 0 | 120 | | 34 | 7,200 | 0 | 7,200 |
| | 5 | Equipment & facilities | Set (4) | 0.6 | 0.4 | 105,000 | | 44 | 63,000 | 42000 | 105,000 |
| | 6 | Local transport | Trip | 1 | 1 | 300 | | 33 | 300 | 300 | 600 |
| | 7 | Consumable items | - | 1 | 0 | 300 | | 51 | 300 | 0 | 300 |
| **Total Activity 5.2** | | | | | | | | | **93,200** | **42,300** | **135,500** |
| Activity 5.3. To publish and disseminate information on tested technologies and conduct two trainings for rubber growers, investors and government staffs | 1 | International Consultant | MM | 1 | 0 | 10,000 | Q3-Q4, Y1 | 15 | 10,000 | 0 | 10,000 |
| | 2 | International air ticket | Trip | 1 | 0 | 1,500 | Q1-Q4 | 31 | 1,500 | 0 | 1,500 |
| | 3 | National Consultant | MM | 1 | 0 | 2,000 | Y2-Y3 | 21 | 2,000 | 0 | 2,000 |
| | 4 | Domestic air tickets for 2 | Trip | 2 | 0 | 400 | | 32 | 800 | 0 | 800 |
| | 5 | DSA, IC | MD | 30 | 0 | 120 | | 34 | 3,600 | 0 | 3,600 |
| | 6 | DSA, NC | MD | 14 | 0 | 60 | | 35 | 840 | 0 | 840 |
| | 7 | DSA, 40 trainees | MD | 200 | 0 | 40 | | 36 | 8,000 | 0 | 8,000 |
| | 8 | Local transport | Trip | 1 | 1 | 300 | | 33 | 300 | 300 | 600 |
| | 9 | Professional publisher | Package | 0.5 | 0.5 | 6,000 | | 24 | 3,000 | 3000 | 6,000 |
| | 10 | Miscellaneous | - | - | - | 600 | | 64 | 300 | 300 | 600 |
| **Total Activity 5.3** | | | | | | | | | **30,340** | **3,600** | **33,940** |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Activity 5.4 To develop a R&D program on rubber wood resource utilization in collaboration with main stakeholders | 1 | National Consultant | MM | 1 | 0 | 1,500 | Q1-Q4 | 21 | 1,500 | 0 | 1,500 |
| | 2 | Consumables | - | 0 | 1 | 400 | Y3 | 51 | 0 | 400 | 400 |
| | 3 | Miscellaneous | - | 0.5 | 0.5 | 1,600 | | 64 | 800 | 800 | 1,600 |
| **Total Activity 5.4** | | | | | | | | | **2,300** | **1,200** | **3,500** |
| **Total Output 5** | | | | | | | | | **129,640** | **48,000** | **177,640** |
| **Non Activity based expenses** | | | | | | | | | | | |
| | - Key Personnel | | | | | | | | | | |
| | 1 | MM Project Coordinator | MM | 28.8 | 7.2 | 2500 | | 11 | 72000 | 18000 | 90,000 |
| | 2 | Project Secretary | MM | 28.8 | 7.2 | 500 | | 12 | 14400 | 3600 | 18,000 |
| | 3 | 3 Technicians | MM | 36 | 72 | 500 | | 13 | 18000 | 36000 | 54,000 |
| | - Office Operation | | | | | | | | | | |
| | 4 | Office Space 50 m2 | MM | 0 | 36 | 800 | | 53 | 0 | 28800 | 28,800 |
| | 5 | Communication | MM | 0 | 36 | 500 | | 54 | 0 | 18000 | 18,000 |
| | 6 | Electricity and fuels | MM | 0 | 36 | 500 | | 52 | 0 | 18000 | 18,000 |
| | 7 | Facilities | Set | 0 | 1 | 10000 | | 42 | 0 | 10000 | 10,000 |
| | - Duty Travel | | | | | | Y1 - Y3 | | | | |
| | 8 | Air tickets, 2 key personnel | Trip | 15 | 5 | 200 | | 32 | 3000 | 1000 | 4,000 |
| | 9 | DSA, Key Personnel | MD | 100 | 0 | 60 | | 37 | 6000 | 0 | 6,000 |
| | 10 | Local Transport | Trip | 10 | 10 | 300 | | 33 | 3000 | 3000 | 6,000 |
| | 11 | Auditing | Yearly | 3 | 1 | 1,300 | | 61 | 3900 | 1300 | 5,200 |
| | 12 | Consumables | MM | 18 | 18 | 400 | | 51 | 7200 | 7200 | 14,400 |
| | 13 | Miscellaneous | - | 0.5 | 0.5 | 6,000 | | 64 | 3000 | 3000 | 6,000 |
| | 14 | Publications, 8 reports | Set | 500 | 300 | 15 | | 24 | 7500 | 4500 | 12,000 |
| | 15 | Land and building | Set | 0 | 1 | 35,000 | | 43 | 0 | 35000 | 35,000 |
| **Total Non Activity based expenses** | | | | | | | | | **138,000** | **187,400** | **325,400** |
| ***Total Budget by activity*** | | | | | | | | | ***449,040*** | ***266,700*** | ***715,740*** |
| | | | | | | | | | | | |
| | 1 | Monitoring and Review Costs | | 1 | - | 18,000 | | 81 | 18,000 | 0 | 18,000 |
| | 2 | Ex-post project evaluation | | 1 | - | 15,000 | Y1 - Y3 | 82 | 15,000 | 0 | 15,000 |
| | 3 | Programme Support Costs | | 1 | - | 38,563 | | 83 | 38,563 | 0 | 38,563 |
| **Total Monev** | | | | | | | | | **71,563** | **0** | **71,563** |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Refund of PPD costs** | | | | | | | | | **84,491** | **0** | **84,491** |
| **Executing Agency Management Costs (Project Steering Committee)** | | | | | | | Y1 - Y3 | 70 | 0 | **36,000** | **36,000** |
| **Total Budget** | | | | | | | | | **605,094** | **302,700** | **907,794** |

## 7.2. Overall Project Budget by Activity

| Output and Activities | Budget Components | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 10. Project Personnels | | 20. Sub Contract | | 30 Duty Travel | | 40. Capital Items | | 50. Consumable Items | | 60. Miscellaneous | | Quarter Year | Grand Total | |
| | ITTO | GOI | ITTO | GOI | ITTO | GOI | ITTO | GOI | ITTO | GOI | ITTO | GOI | | ITTO | GOI |
| **Output 1. Interest in the utilization of rubber wood owned by big companies increased** | | | | | | | | | | | | | | | |
| Activity 1.1. To provide reliable information on potential benefits of utilizing rubber wood owned by big companies | 2,250 | - | - | - | 1,900 | 300 | - | - | - | - | 300 | 300 | Q1-Q2, Y1 | 4,450 | 600 |
| Activity 1.2. To facilitate intensive dialogue for adjustment of replanting schedule by big companies to ensure steady supply of wood to processing mills | - | - | - | - | 5,760 | 3,780 | - | - | - | - | 600 | - | Q2-Q3, Y1 | 6,360 | 3,780 |
| Activity 1.3. To organize one national workshop on rubber wood utilization involving main stakeholders | - | - | 14,000 | - | 3,800 | - | - | - | 600 | - | - | 600 | Q3-Q4, Y1 | 18,400 | 600 |
| Activity 1.4. To facilitate establishment of joint investment between rubber growers and wood processors in rubber wood utilization | - | - | - | - | - | 4,320 | - | - | | - | - | - | Q1Q4, Y2-Y3 | 0 | 4,320 |
| **Sub Total 1** | **2,250** | **-** | **14,000** | **-** | **11,460** | **8,400** | **-** | **-** | **600** | **-** | **900** | **900** | | **29,210** | **9,300** |
| **Output 2. Incentives for and capacity in the utilization of wood from smallholding plantations improved** | | | | | | | | | | | | | | | |
| Activity 2.1. To provide reliable information on benefits of and constraints to utilizing rubber wood owned by farmers | - | - | 3,000 | - | 3,380 | 300 | - | - | - | 600 | 400 | 400 | Q1-Q2, Y1 | 6,780 | 1,300 |
| Activity 2.2. To carry out intensive consultation with farmers regarding requirements for and impacts of rubber wood utilization on farmers' livelihood | - | - | 3,000 | - | 2,600 | 600 | - | - | 200 | 200 | 400 | 200 | Q2-Q3, Y1 | 6,200 | 1,000 |
| Activity 2.3. To establish models plantation with cash-crops inter-planting for demonstration and training of farmers (4 sites, total 20 Ha). | - | 3,000 | 4,500 | - | 4,600 | 600 | - | - | 6,000 | - | 300 | 300 | Q3-Q4 Y1, Q1-Q4 Y2 | 15,400 | 3,900 |
| Activity 2.4. To train farmers on efficient techniques for replanting and harvesting of old trees (4 trainings, 80 trainees). | - | - | 6,000 | - | 15,200 | 1,200 | - | - | 3,500 | 1,000 | 4,000 | 500 | Q3-Q4, Y2-Y3 | 28,700 | 2,700 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Activity 2.5. To identify feasible options for local governments to adopt in assisting farmers in rubber replanting | - | -- | 1,500 | - | 2,600 | 600 | - | - | - | - | 800 | 800 | Q2-Q3, Y1 | 4,900 | 1,400 |
| **Sub Total 2.** | **-** | **3,000** | **18,000** | **-** | **28,380** | **3,300** | **-** | **-** | **9,700** | **1,800** | **5,900** | **2,200** | | **61,980** | **10,300** |
| **Output 3. Government policy governing rubber wood resource utilization revised and enhanced** | | | | | | | | | | | | | | | |
| Activity 3.1. To review existing laws, rules and regulations on rubber wood utilization | - | - | 2,250 | - | - | - | - | - | 600 | - | 300 | 300 | Q1-Q2, Y1 | 3,150 | 300 |
| Activity 3.2. To formulate a new policy that encourages efficient utilization of rubber wood resource. | - | - | 1,500 | - | - | - | - | - | - | - | - | 800 | Q2-Q3, Y1 | 1,500 | 800 |
| Activity 3.3. To organize one national workshop on the new policy involving main stakeholders | - | - | 14,000 | - | 3,800 | - | - | - | 500 | - | - | 600 | Q3-Q4, Y1 | 18,300 | 600 |
| Activity 3.4. To establish coordinating mechanisms for rubber wood resource utilization at different levels of government | - | - | - | - | 4,560 | 900 | - | - | - | - | 2,600 | 1,200 | Q1-Q2, Y2 | 7,160 | 2,100 |
| Activity 3.5 To submit the new policy to the government for adoption | - | - | - | - | - | - | - | - | - | - | 600 | 1,500 | Q1-Q2, Y2 | 600 | 1,500 |
| **Sub Total 3.** | **-** | **-** | **17,750** | **-** | **8,360** | **900** | **-** | **-** | **1,100** | **-** | **3,500** | **4,400** | | **30,710** | **5,300** |
| **Output 4. Investment in rubber wood utilization increased** | | | | | | | | | | | | | | | |
| Activity 4.1. To provide and disseminate up-dated and reliable information on rubber wood growing stock, product markets and processing technologies | - | - | 3,000 | - | 2,000 | 400 | - | - | 200 | 200 | 400 | 300 | Q3-Q4 Y1, Q1-Q4 Y2 - Y3 | 5,600 | 900 |
| Activity 4.2. To conduct field surveys on growing stock of farmers' rubber plantations at four sites and produce updated map of plantations in Sumatra Island | - | 1,800 | 9,500 | - | 5,200 | 800 | - | - | 2,400 | - | - | - | Q3-Q4, Y1, Q1 - Q4 Y2 | 17,100 | 2,600 |
| Activity 4.3. To organize two regional workshops on investment in rubber wood resource utilization and its role in economic development | - | - | 28,000 | - | - | - | - | - | - | - | 400 | 200 | Q1-Q2, Y2 - Y3 | 28,400 | 200 |
| Activity 4.4 To install and operate a publicly accessible rubber wood information system | - | - | 3,000 | - | - | - | 5,000 | 2,500 | - | - | 400 | 200 | Q1-Q2, Y3 | 8,400 | 2,700 |
| **Sub Total 4.** | **-** | **1,800** | **43,500** | **-** | **7,200** | **1,200** | **5,000** | **2,500** | **2,600** | **200** | **1,200** | **700** | | **59,500** | **6,400** |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Output 5. Appropriate technologies are available for the utilization of rubber wood from smallholding plantation** | | | | | | | | | | | | | | | |
| Activity 5.1. To identify alternative technologies and select most promising alternative | 1,500 | - | - | - | 2,000 | 600 | - | - | - | - | 300 | 300 | Q1-Q2, Y1 | 3,800 | 900 |
| Activity 5.2. To procure, install and pilot test of equipment and facilities | 20,000 | - | - | - | 9,900 | 300 | 63,000 | 42,000 | 300 | - | - | - | Q2-Q3, Y1 | 93,200 | 42,300 |
| Activity 5.3. To publish and disseminate information on tested technologies and conduct two trainings for rubber growers, investors and government staffs | 10,000 | - | 5,000 | 3,000 | 15,040 | 300 | - | - | - | - | 300 | 300 | Q3-Q4, Y1, Q1 - Q2, Y2-Y3 | 30,340 | 3,600 |
| Activity 5.4 To develop a R&D program on rubber wood resource utilization in collaboration with main stakeholders | - | - | 1,500 | - | - | - | - | - | - | 400 | 800 | 800 | Q1-Q4, Y3 | 2,300 | 1,200 |
| **Sub Total 5.** | **31,500** | **-** | **6,500** | **3,000** | **26,940** | **1,200** | **63,000** | **42,000** | **300** | **400** | **1,400** | **1,400** | | **129,640** | **48,000** |
| **Non Activity based expenses** | **104,400** | **57,600** | **7,500** | **4,500** | **12,000** | **4,000** | **-** | **45,000** | **7,200** | **72,000** | **6,900** | **4,300** | **Y1 - Y3** | **138,000** | **187,400** |
| **Total Budget by activity** | **138,150** | **62,400** | **107,250** | **7,500** | **94,340** | **19,000** | **68,000** | **89,500** | **21,500** | **74,400** | **19,800** | **13,900** | | **449,040** | **266,700** |
| **ITTO Monitoring, Evaluation and Administration Cost** | | | | | | | | | | | | | **Y1 - Y3** | **71,563** | **-** |
| **Refund of PPD costs** | | | | | | | | | | | | | | **84,491** | **-** |
| **Executing Agency Management Costs** | | | | | | | | | | | | | **Y1 - Y3** | **-** | **36,000** |
| **Total Budget** | | | | | | | | | | | | | | **605,094** | **302,700** |

### 7.3.1. Yearly project budget by source – ITTO

| Budget Component \ Annual disbursement | Total | Year 1 | Year 2 | Year 3 |
|---|---|---|---|---|
| 10. Project Personnel | 138,150 | 68,550 | 34,800 | 34,800 |
| 20. Sub-contract | 107,250 | 51,000 | 32,875 | 23,375 |
| 30. Duty travel | 94,340 | 52,647 | 27,093 | 14,600 |
| 40. Capital Item | 68,000 | 68,000 | 0 | 0 |
| 50. Consumable Item | 21,500 | 7,450 | 9,850 | 4,200 |
| 60. Miscellaneous | 19,800 | 5,800 | 8,400 | 5,600 |
| 70. Executing Agency Management Costs | 0 | 0 | 0 | 0 |
| **Total budget by activity** | **449,040** | **253,447** | **113,018** | **82,575** |
| 80. ITTO Monitoring, Evaluation and Administration Costs | | | | |
| 81. Monitoring and Review | 18,000 | | | |
| 82. Ex-post Evaluation | 15,000 | | | |
| 83. Program Support Cost (8% of total ITTO budget) | 38,563 | | | |
| 90. Refund of Pre-Project Costs | 84,491 | | | |
| **ITTO TOTAL** | **605,094** | | | |

### 7.3.2. Yearly project budget by source – GOI

| Budget Component \ Annual disbursement | Total | Year 1 | Year 2 | Year 3 |
|---|---|---|---|---|
| 10. Project Personnel | 62,400 | 20,800 | 22,400 | 19,200 |
| 20. Sub-contract | 7,500 | 1,500 | 1,500 | 4,500 |
| 30. Duty travel | 19,000 | 9,247 | 5,893 | 3,860 |
| 40. Capital Item | 89,500 | 61,167 | 14,167 | 14,167 |
| 50. Consumable Item | 74,400 | 24,850 | 24,600 | 24,950 |
| 60. Miscellaneous | 13,900 | 5,625 | 4,600 | 3,675 |
| 70. Executing Agency Management Costs | 36,000 | 12,000 | 12,000 | 12,000 |
| **Total budget by activity** | **302,700** | **135,188** | **85,160** | **82,352** |
| 80. ITTO Monitoring, Evaluation and Administration Costs | | | | |
| 81. Monitoring and Review | 0 | | | |
| 82. Evaluation | 0 | | | |
| 83. Program Support Cost | 0 | | | |
| 90. Refund of Pre-Project Costs | 0 | | | |
| **GOI TOTAL** | **302,700** | | | |

## 7.4.1. Consolidated project budget (ITTO Contribution)

| Budget Components | | | Total | Total Annual Disbursement | | |
|---|---|---|---|---|---|---|
| | | | | YEAR 1 | YEAR 2 | YEAR 3 |
| 10 | Project personnel | | | | | |
| | 11 | Project Coordinator | 72,000 | 24,000 | 24,000 | 24,000 |
| | 12 | Secretary | 14,400 | 4,800 | 4,800 | 4,800 |
| | 13 | Technicians | 18,000 | 6,000 | 6,000 | 6,000 |
| | 14 | Laborers | 0 | 0 | 0 | 0 |
| | 15 | International Consultants | 33,750 | 33,750 | 0 | 0 |
| | **19** | **Component Total** | **138,150** | **68,550** | **34,800** | **34,800** |
| 20 | Sub Contract | | | | | |
| | 21 | National Consultants | 29,750 | 19,250 | 9,000 | 1,500 |
| | 22 | Professional Trainers | 6,000 | 0 | 3,000 | 3,000 |
| | 23 | Professional Event Organizer | 56,000 | 28,000 | 14,000 | 14,000 |
| | 24 | Professional publisher | 15,500 | 3,750 | 6,875 | 4,875 |
| | **29** | **Component Total** | **107,250** | **51,000** | **32,875** | **23,375** |
| 30 | Duty Travel | | | | | |
| | 31 | International air tickets | 3,500 | 3,500 | 0 | 0 |
| | 32 | Domestic air tickets | 20,600 | 14,600 | 5,000 | 1,000 |
| | 33 | Local transport | 8,400 | 5,467 | 2,033 | 900 |
| | 34 | DSA International Consultant | 12,600 | 12,600 | 0 | 0 |
| | 35 | DSA Domestic | 17,880 | 13,280 | 4,600 | 0 |
| | 36 | DSA Farmers/trainers | 23,200 | 200 | 11,800 | 11,200 |
| | 37 | DSA Key Personnel | 8,160 | 3,000 | 3,660 | 1,500 |
| | **39** | **Component Total** | **94,340** | **52,647** | **27,093** | **14,600** |
| 40 | Capital Items | | | | | |
| | 41 | PC and facilities | 5,000 | 5,000 | 0 | 0 |
| | 42 | Offices facilities | 0 | 0 | 0 | 0 |
| | 43 | Vehicle | 0 | 0 | 0 | 0 |
| | 44 | Equipment and facilities | 63,000 | 63,000 | 0 | 0 |
| | **49** | **Component Total** | **68,000** | **68,000** | **0** | **0** |
| 50 | Consumable Items | | | | | |
| | 51 | Consumables | 20,000 | 7,450 | 9,100 | 3,450 |
| | 52 | Electricity and fuels | 0 | 0 | 0 | 0 |
| | 53 | Office Space | 0 | 0 | 0 | 0 |
| | 54 | Communication | 0 | 0 | 0 | 0 |
| | 55 | Training room | 1,500 | 0 | 750 | 750 |
| | **59** | **Component Total** | **21,500** | **7,450** | **9,850** | **4,200** |
| 60 | Miscellaneous | | | | | |
| | 61 | Auditing | 3,900 | 1,300 | 1,300 | 1,300 |
| | 62 | Consultation | 1,800 | 0 | 1,800 | 0 |
| | 63 | Training facilities | 3,000 | 0 | 1,500 | 1,500 |
| | 64 | Other miscellaneous | 11,100 | 4,500 | 3,800 | 2,800 |
| | **69** | **Component Total** | **19,800** | **5,800** | **8,400** | **5,600** |
| 70 | Executing Agency Management Cost | | | | | |
| | 79 | Component Total | **0** | **0** | **0** | **0** |
| | **Total budget by activity** | | **449,040** | **253,447** | **113,018** | **82,575** |
| 80 | ITTO Monitoring, Evaluation and Administration | | | | | |
| | 81 | Monitoring and Review Costs | 18,000 | | | |
| | 82 | Ex-post project evaluation | 15,000 | | | |
| | 83 | Programme Support Cost | 38,563 | | | |
| | **89** | **Component Total** | **71,563** | | | |
| 90 | Refund of Pre-Project Costs | | 84,491 | | | |
| **100** | **GRAND TOTAL** | | **605,094** | | | |

## 7.4.2. Consolidated project budget (GOI Contribution)

| Budget Components | | | Total | Total Annual Disbursement | | |
|---|---|---|---|---|---|---|
| | | | | YEAR 1 | YEAR 2 | YEAR 3 |
| 10 | | Project personnel | | | | |
| | 11 | Project Coordinator | 18,000 | 6,000 | 6,000 | 6,000 |
| | 12 | Secretary | 3,600 | 1,200 | 1,200 | 1,200 |
| | 13 | Technicians | 36,000 | 12,000 | 12,000 | 12,000 |
| | 14 | Laborers | 4,800 | 1,600 | 3,200 | 0 |
| | 15 | International Consultants | 0 | 0 | 0 | 0 |
| | **19** | **Component Total** | **62,400** | **20,800** | **22,400** | **19,200** |
| 20 | | Sub Contract | | | | |
| | 21 | National Consultants | 0 | 0 | 0 | 0 |
| | 22 | Professional Trainers | 0 | 0 | 0 | 0 |
| | 23 | Professional Event Organizer | 0 | 0 | 0 | 0 |
| | 24 | Professional publisher | 7,500 | 1,500 | 1,500 | 4,500 |
| | **29** | **Component Total** | **7,500** | **1,500** | **1,500** | **4,500** |
| 30 | | Duty Travel | | | | |
| | 31 | International air tickets | 0 | 0 | 0 | 0 |
| | 32 | Domestic air tickets | 6,400 | 2,400 | 2,000 | 2,000 |
| | 33 | Local transport | 10,800 | 5,767 | 3,533 | 1,500 |
| | 34 | DSA International Consultant | 0 | 0 | 0 | 0 |
| | 35 | DSA Domestic | 1,800 | 1,080 | 360 | 360 |
| | 36 | DSA Farmers/trainers | 0 | 0 | 0 | 0 |
| | 37 | DSA Key Personnel | 0 | 0 | 0 | 0 |
| | **39** | **Component Total** | **19,000** | **9,247** | **5,893** | **3,860** |
| 40 | | Capital Items | | | | |
| | 41 | PC and facilities | 2,500 | 2,500 | 0 | 0 |
| | 42 | Offices facilities | 10,000 | 5,000 | 2,500 | 2,500 |
| | 43 | Vehicle | 35,000 | 11,667 | 11,667 | 11,667 |
| | 44 | Equipment and facilities | 42,000 | 42,000 | 0 | 0 |
| | **49** | **Component Total** | **89,500** | **61,167** | **14,167** | **14,167** |
| 50 | | Consumable Items | | | | |
| | 51 | Consumables | 9,100 | 3,250 | 2,750 | 3,100 |
| | 52 | Electricity and fuels | 18,000 | 6,000 | 6,000 | 6,000 |
| | 53 | Office Space | 28,800 | 9,600 | 9,600 | 9,600 |
| | 54 | Communication | 18,000 | 6,000 | 6,000 | 6,000 |
| | 55 | Training room | 500 | 0 | 250 | 250 |
| | **59** | **Component Total** | **74,400** | **24,850** | **24,600** | **24,950** |
| 60 | | Miscellaneous | | | | |
| | 61 | Auditing | 1,300 | 0 | 0 | 1,300 |
| | 62 | Consultation | 2,700 | 0 | 2,700 | 0 |
| | 63 | Training facilities | 0 | 0 | 0 | 0 |
| | 64 | Other miscellaneous | 9,900 | 5,625 | 1,900 | 2,375 |
| | **69** | **Component Total** | **13,900** | **5,625** | **4,600** | **3,675** |
| 70 | | Executing Agency Management Cost | | | | |
| | 79 | Component Total | **36,000** | **12,000** | **12,000** | **12,000** |
| | **Total budget by activity** | | **302,700** | **135,188** | **85,160** | **82,352** |
| 80 | | ITTO Monitoring, Evaluation and Administration | | | | |
| | 81 | Monitoring and Review Costs | 0 | | | |
| | 82 | Ex-post project evaluation | 0 | | | |
| | 83 | Programme Support Cost | 0 | | | |
| | **89** | **Component Total** | **0** | | | |
| 90 | | Refund of Pre-Project Costs | 0 | | | |
| **100** | | **GRAND TOTAL** | **302,700** | | | |

## 7.4.3. Consolidated project budget (total budget)

| Budget Components | | | Total | Total Annual Disbursement | | |
|---|---|---|---|---|---|---|
| | | | | YEAR 1 | YEAR 2 | YEAR 3 |
| 10 | Project personnel | | | | | |
| | 11 | Project Coordinator | 90,000 | 30,000 | 30,000 | 30,000 |
| | 12 | Secretary | 18,000 | 6,000 | 6,000 | 6,000 |
| | 13 | Technicians | 54,000 | 18,000 | 18,000 | 18,000 |
| | 14 | Laborers | 4,800 | 1,600 | 3,200 | 0 |
| | 15 | International Consultants | 33,750 | 33,750 | 0 | 0 |
| | **19** | **Component Total** | **200,550** | **89,350** | **57,200** | **54,000** |
| 20 | Sub Contract | | | | | |
| | 21 | National Consultants | 29,750 | 19,250 | 9,000 | 1,500 |
| | 22 | Professional Trainers | 6,000 | 0 | 3,000 | 3,000 |
| | 23 | Professional Event Organizer | 56,000 | 28,000 | 14,000 | 14,000 |
| | 24 | Professional publisher | 23,000 | 5,250 | 8,375 | 9,375 |
| | **29** | **Component Total** | **114,750** | **52,500** | **34,375** | **27,875** |
| 30 | Duty Travel | | | | | |
| | 31 | International air tickets | 3,500 | 3,500 | 0 | 0 |
| | 32 | Domestic air tickets | 27,000 | 17,000 | 7,000 | 3,000 |
| | 33 | Local transport | 19,200 | 11,233 | 5,567 | 2,400 |
| | 34 | DSA International Consultant | 12,600 | 12,600 | 0 | 0 |
| | 35 | DSA Domestic | 19,680 | 14,360 | 4,960 | 360 |
| | 36 | DSA Farmers/trainers | 23,200 | 200 | 11,800 | 11,200 |
| | 37 | DSA Key Personnel | 8,160 | 3,000 | 3,660 | 1,500 |
| | **39** | **Component Total** | **113,340** | **61,893** | **32,987** | **18,460** |
| 40 | Capital Items | | | | | |
| | 41 | PC and facilities | 7,500 | 7,500 | 0 | 0 |
| | 42 | Offices facilities | 10,000 | 5,000 | 2,500 | 2,500 |
| | 43 | Vehicle | 35,000 | 11,667 | 11,667 | 11,667 |
| | 44 | Equipment and facilities | 105,000 | 105,000 | 0 | 0 |
| | **49** | **Component Total** | **157,500** | **129,167** | **14,167** | **14,167** |
| 50 | Consumable Items | | | | | |
| | 51 | Consumables | 29,100 | 10,700 | 11,850 | 6,550 |
| | 52 | Electricity and fuels | 18,000 | 6,000 | 6,000 | 6,000 |
| | 53 | Office Space | 28,800 | 9,600 | 9,600 | 9,600 |
| | 54 | Communication | 18,000 | 6,000 | 6,000 | 6,000 |
| | 55 | Training room | 2,000 | 0 | 1,000 | 1,000 |
| | **59** | **Component Total** | **95,900** | **32,300** | **34,450** | **29,150** |
| 60 | Miscellaneous | | | | | |
| | 61 | Auditing | 5,200 | 1,300 | 1,300 | 2,600 |
| | 62 | Consultation | 4,500 | 0 | 4,500 | 0 |
| | 63 | Training facilities | 3,000 | 0 | 1,500 | 1,500 |
| | 64 | Other miscellaneous | 21,000 | 10,125 | 5,700 | 5,175 |
| | **69** | **Component Total** | **33,700** | **11,425** | **13,000** | **9,275** |
| 70 | Executing Agency Management Cost | | | | | |
| | 79 | Component Total | **36,000** | **12,000** | **12,000** | **12,000** |
| | **Total budget by activity** | | **751,740** | **388,635** | **198,178** | **164,927** |
| 80 | ITTO Monitoring, Evaluation and Administration | | | | | |
| | 81 | Monitoring and Review Costs | 18,000 | | | |
| | 82 | Ex-post project evaluation | 15,000 | | | |
| | 83 | Programme Support Cost | 38,563 | | | |
| | **89** | **Component Total** | **71,563** | | | |
| 90 | Refund of Pre-Project Costs | | 84,491 | | | |
| **100** | **GRAND TOTAL** | | **907,794** | | | |

## PART III: OPERATIONAL ARRANGEMENTS

1. Management Structure

ISWA is the Executing Agency of the Project appointed by the Government of Indonesia and will implement the project in cooperation with other institutions including Directorate General of Forestry Products Management (BPK) and Forestry Research and Development Agency (FORDA) of the Ministry of Forestry, provincial and local governments, local communities, Local NGOs and Universities.

As the Executing Agency, ISWA shall establish a Project Steering Committee (PSC) mandated to: i) provide policy directives for operations; ii) conduct periodical evaluation on progress in implementation; and iii) review and approve yearly plans of operation (YPO), financial and technical reports. Membership of the PSC will comprise representatives of the Ministries of Forestry, Agriculture, Trade and Industry, representatives of rubber growers, ITTO, ISWA, donor(s) and District Governments hosting the project while chairman of the PSC will be the representative of the Ministry of Forestry. Organizational structure of the project is as exhibited in Figure 1.

ISWA will establish a Project Implementing Unit (PIU) to be headed by a Project Leader with the assistance of a Secretary and Technical Staffs, ad-hoc national experts and Consultants.

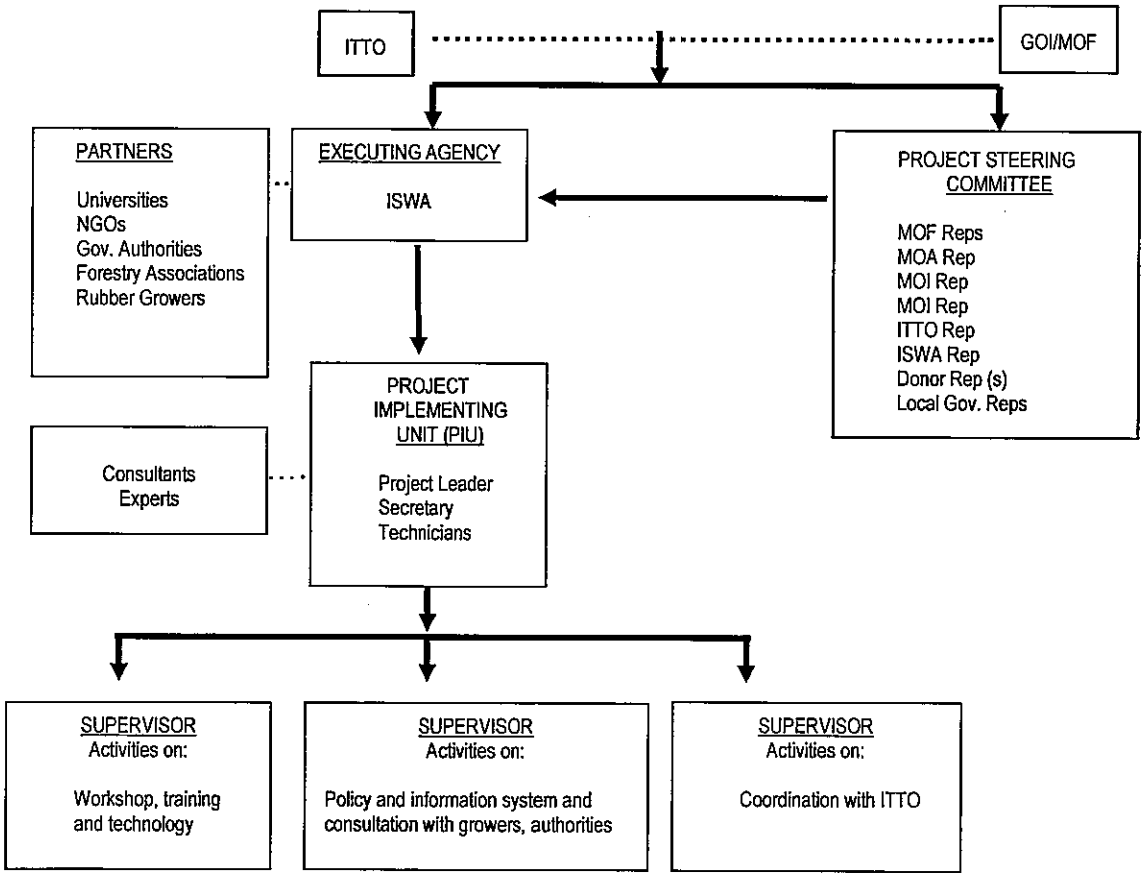



Figure 1: Organizational Structure of Project Management

2. Monitoring, Reporting and Evaluation

a. Yearly Plans of Operation (YPOs)

The first YPO will be submitted to ITTO for review and approval at least one month prior to commencing operation. Likewise, the second and third YPOs will be submitted one month before operations in the second and third year start.

b. Progress Reports

The first progress report on implementation will be submitted to ITTO every six months, starting on the seventh month for review and approval.

c. Technical Reports

A technical report on any activity or output will be submitted to ITTO for information base or for dissemination to other member countries three month after completion of a particular activities or activities pertaining to the output.

d. Financial Audit Reports

Three Annual Financial Audit Reports will be submitted to ITTO during the project duration, the first year report being on 31 March of the second year. A final financial audit report shall be submitted at least four months after completion of all project activities.

e. Completion Report

A completion report will be submitted to ITTO at least three months after completion of all project activities.

f. Project monitoring meetings

The first meeting of the PSC is best to be held soon after the project operations begin. An early meeting is useful for avoiding any serious operational mistakes due to misunderstanding or misinterpretation of the ITTO rules and procedures applying to the project by the PIU. The subsequent meetings will be decided by the PSC every time it meets. Project site visit by PSC members will be arranged as necessary and at the request of the PSC.

Meetings of the PIU shall be held monthly in the first week of the month or as need arises to ensure that any deviation can be detected and fixed at the earliest possible.

2. Future Operation and Maintenance

All technical reports will be submitted to ITTO and the Government of Indonesia for their own use and dissemination as information contained in the reports may be useful for ITTO members and for Indonesian stakeholders. Project assets such as computers and installed information system will remain with ISWA to support activities relating to rubber wood utilization.

Upon project completion, strategic project activities will be further implemented under the supervision and monitoring of ISWA and its selected provincial branch offices at its own cost without external funding. ISWA will strive to provide technical assistance to its members, big rubber growers and farmers involved in the process of utilization of rubber wood in order to avoid losing the momentum of moving forward created by the project. For

instance, dissemination of the appropriate technologies developed under the project, training of farmers on harvesting and replanting and furnishing of information on rubber wood resource base, markets and technologies should be continued in view of sustaining the project impacts.

Future use of the capital items procured, installed and pilot tested under the project, comprising one set of peeling, sawing, chipping and kiln-drying each, will be basically used for training on rubber wood processing. Management of the Training Center shall be the responsibility of ISWA, Ministry of Forestry and the District Government hosting the Center. Format of operational management and task as well as responsibility of each party shall be defined before the termination of assistance by ITTO in view of securing the needed resources for the continued functioning of the Training Center.

The machine and facilities to be procured and installed are:

- Sawing machine: Table Band Saw 36" ex China, model YT-36
- Peeling machine: Rotary Veneer Lathe ex China, model BQ 1513/7
- Chipping machine: ex China, model BX2116 Drum Chipper
- Kiln-drying chamber: It is a container-like chamber of 40 ft size with drying capacity of approximately 40 m3 using solar energy. This drying chamber will be self designed and to be developed in collaboration with local workshop.

## PART IV: TROPICAL TIMBER FRAMEWORK

1. Compliance with ITTA 1994 Objectives

The proposed project concerns with the promotion of rubber wood utilization from sustainable sources in Indonesia which are rubber plantations by pursuing operational strategies relevant for increased processing and exports of rubber wood products thus diversified products (Outputs 1, 2, 4 and pertaining activities), promotion of research and development on rubber replanting techniques and appropriate processing technologies (Outputs 2 and 4 and pertaining activities), promotion of further processing of wasted rubber wood resource through promotion of investment (Outputs 4, 5 and pertaining activities) and enhancement of government policy on rubber wood resource utilization (Output 3 and pertaining activities). Therefore, the project complies with the ITTO's objectives as expressed in Article 1 of the ITTA 1994 Sections d, e, f, i and l.

2. Compliance with the ITTO Action Plan 2002- 2006

The proposed project complies in particular with Actions 1, 3 and 5 of Goal 1 of the Committee on Forest Industry for the following reasons:

- The project concerns with the promotion of private investment through facilitating information on investment opportunities (Output 4 and pertaining activities);
- The project is to conduct study on potential benefits of utilizing rubber wood and identify critical knowledge and information gaps (Outputs 1, 4, 5 and relevant activities); and
- The project promotes investments in timber processing by taking steps to reduce supply-demand gap of wood raw materials facing the national wood industry, organize workshops on the use of new processing technologies and improve institutional efficiency and effectiveness through trainings related to harvesting, replanting of rubber and application of new processing technologies.

Furthermore, the project is also in compliance with Articles 6 and 8 of Goal 2 of the Forest Industry Committee by publishing studies and information on feasibility of rubber wood resource utilization in terms of ecological, social and economical benefits and by creating community cooperatives and skills for the utilization of owned rubber wood resource.

3. Compliance with the ITTO Technical Mission to Indonesia.

The project is a concrete follow up to the recommendations of the ITTO Technical Mission to Indonesia in 2001 particularly on the utilization of wood from non-forestry such sources as rubber plantations, coconut trees and palm oil estates.

## Annex 1: References


1. Center for Forestry Socio-economic Research and Development, 2001. A Study on the Utilization of Rubber Wood as the Raw Material for the Wood Industry. In collaboration with the Ministry of Industry and Trade, Final Report in Bahasa Indonesia.

2. In-house Experts Working Group, 2007. Road Map for Revitalizing the Indonesian Forestry Industry. Ministry of Forestry, in Bahasa Indonesia.

3. ISWA and ITTO, 2005. Rubber wood resources and utilization in Indonesia. Completion Report of Pre-Project PPD 80/03 Re.2 (F) "Promoting the Utilization of Rubber Wood from Sustainable Sources in Indonesia".

4. ISWA and ITTO, 2005. Rubber wood resources and utilization in Indonesia. Technical Report of Pre-Project PPD 80/03 Rev. 2 (F) "Promoting the Utilization of Rubber Wood from Sustainable Sources in Indonesia".

5. ITTO, 2001. Achieving Sustainable Forest Management in Indonesia

**Annex 2: Outlines of Terms of Reference for Project Key Personnel, Consultants and Professionals**

| Position in Project Implementation | Activities to get involved in | Main Tasks and Responsibilities |
|---|---|---|
| Project Leader | All | To effectively manage the project operations to achieve the project objective timely within the sanctioned budget in compliance with ITTO rules and procedures.<br><br>To involve main stakeholders in implementation of activities<br><br>To prepare quality and acceptable final technical and financial reports. |
| Project Secretary | All | To assist the Project Leader in the day-to-day management of the project by carrying out efficient office management, arrangements of meeting, travel and logistics, and any supporting works assigned by the Project Leader |
| Project Technicians | As appropriate | To assist in the implementation of project activities including compilation of information needed by Consultants, data analysis, monitoring of field operations and preparation of relevant documents and reports |
| National Consultants | 1.1; 2.1 tru 2.5; 3.1; 3.2; 3.4; 4.1; 4.2; 5.1 5.3; 5.4 | To conduct feasibility study on the utilization of rubber wood owned by big companies.<br><br>To conduct study on potential benefits of utilizing farmers' rubber wood<br><br>To consult with farmers on applicable and beneficial strategies for rubber wood utilization<br><br>To train farmers on harvesting of old trees and rubber replanting with agro-forestry system<br><br>To consult with local governments on feasible assistance to farmers in rubber planting<br><br>To review existing policy on rubber wood utilization, formulate enhanced policy and develop concept of coordinating mechanisms<br><br>To collate information on rubber growing stock, markets for products and development in processing technology, conduct surveys on growing stock, up-date map of plantations and assist in the installment and trial operation of rubber wood information system<br><br>To assist in developing of a R&D program for rubber wood utilization |

| | | |
|---|---|---|
| International Consultants | 5.2 and 5.3 | To identify alternatives of processing technology, select most suitable and practical alternative, install needed equipment and facilities and pilot test their operation, develop standard operating procedures and technical manuals, and conduct training on the use of tested technologies |
| Professional Event Organizers | 1.3; 3.3; 4.3 | Under close supervision of Project Leader, to efficiently organize two national workshops, on rubber wood utilization and on enhanced policy, respectively, and two regional workshops on investment in rubber wood utilization and its role in regional and local economic development. Relevant main stakeholders are to take part in all the workshops. |
| Professional Trainers | 2.4; 2.5 | Selected experienced practitioners are to train farmers on harvesting of rubber trees and on replanting techniques |
| Professional Publishers | 5.3; | In close consultation with Project Leader, to develop design of technical reports as requested, produce quality hard and soft copies, as needed, in accordance with approved design |

## Annex 3: Profile of ISWA

This project will be implemented by the Indonesian Sawmill and Woodworking Association (ISWA) in cooperation with ~~Directorate of Forest Products Processing and Marketing, Ministry of Forestry, Indonesia.~~ **The Directorate General of Forestry Product Management (BPK)**

### 1. Background

ISA was established in 1972 and has been renamed ISWA by The National Congress held in Surabaya, Indonesia on October 31, 2002; the initial purpose was to promote the development of wood industrialization, centered on the production of sawn-timber and downstream processed products, and to assist the marketing of the processed wood products in domestic and international markets. In 1998, ISA comprised 1,465 saw-millers of various scale and was organized through seventeen Regional Coordinators stationed in each province of Indonesia where plants were located. Most of products exported between 1972 and 1988 were in the form of sawn-wood.

Imposition of high export tax of sawn-wood since 1988 has forced ISA members to develop further wood processing facilities. Indeed, downstream processing has grown rapidly since then and today, most of the products exported was in the form of semi-finished and finished products consisting of : **door & window components and engineered timber doors, solid & laminated finger joint flooring, parquet flooring, skirting and various wood profiles, ship-deck & ship flooring, solid & finger joint laminating for furniture & housing parts, scantling three layers laminating, dowel, turning, balustrade, and any kind of wood sticks.**

ISWA members today are around 500 processors, with strong export orientation. During the last decade, members of ISA have been exporting around 1.2 million m3 of processed products per annum valued at US$ 700 million. ISA members consume around 3.0 million m3 (log equivalent) of wood as raw material. Most of the raw material is obtained from domestic free market in the form of rough sawn timber.

### 2. Infrastructure

ISWA Headquarters is at Manggala Wanabakti, Indonesia Forestry Center Building, occupying around 400 m2 of floor. ISWA operates an information system called ISWA Wood Data Center (Pusat Data Perkayuan ISWA, widely known as PDPI). The system utilizes contemporary computer technologies and operates under the domain: ***www.iwwn.com.*** The system contains up to date information on markets of wood products and processing technologies though with some limitations, and members are free to access the system. At present the President of ISWA is Mrs. Hj. Soewarni and the Secretary General is Mr. Jimmy Purwonegoro. In total the Headquarters employs 15 staff; many of them are forestry university graduates.

### 3. Current work programmes

ISWA's working programmes, among others, are

In the supply of wood materials: to compile the resources, species usage, prices of round log and sawn timber (local market information), to increase efficiency of wood materials in line with sustainable forest management.

In production and industry: to develop efficiency and productivity in production of woodworking to obtain the maximum added value, to guide the members to maximize utilization of wood.

In marketing: to monitor the market development and trend of product commodity, to promote the products through exhibitions and our embassies abroad.

In addition, some research works have been done to find lesser-used species (LUS) for product diversification for industry. Primary information on about 60 LUS has been identified.

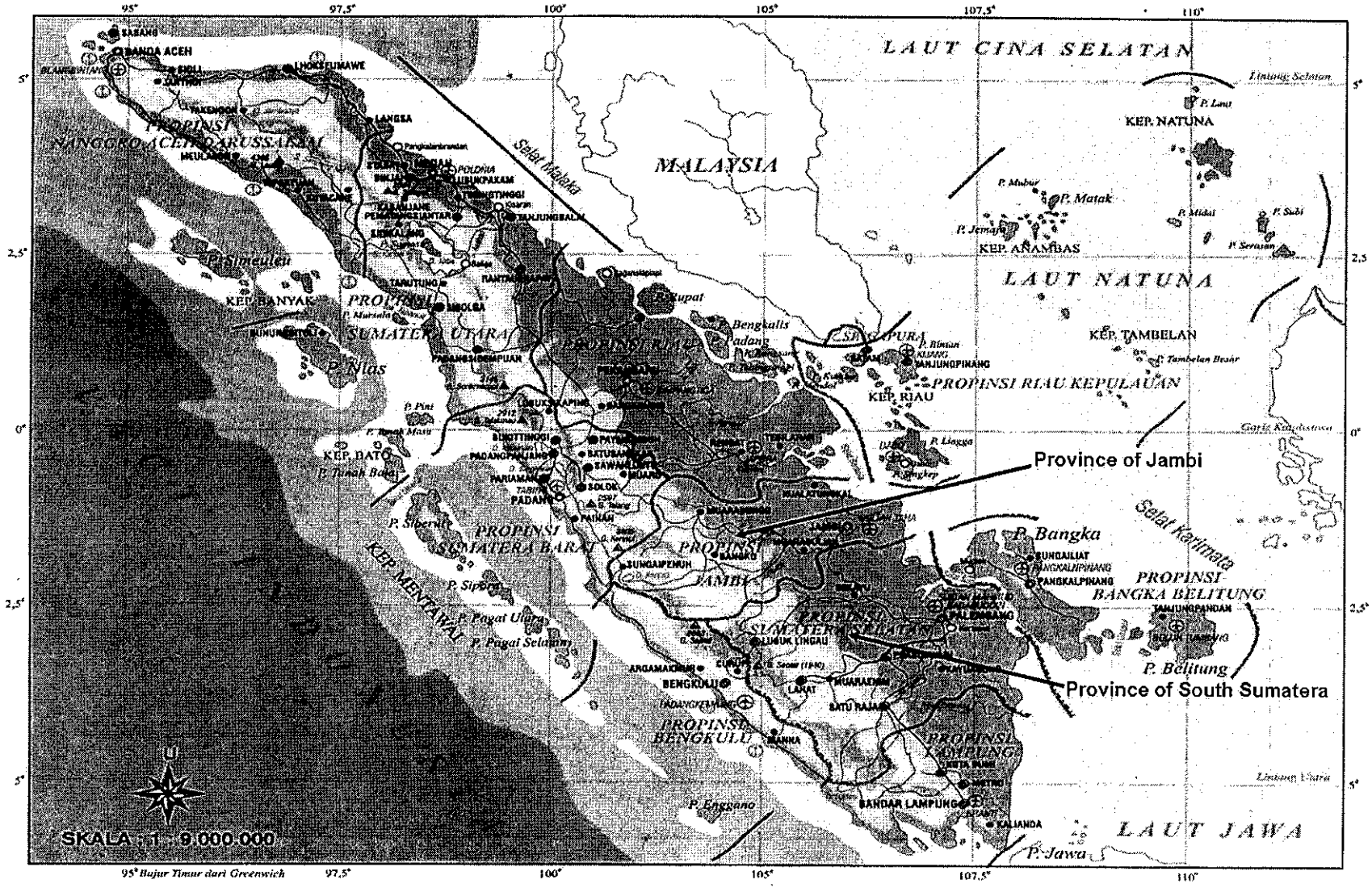
Those programs and activities will support the project proposes which in line with sustainable wood industry in Indonesia.

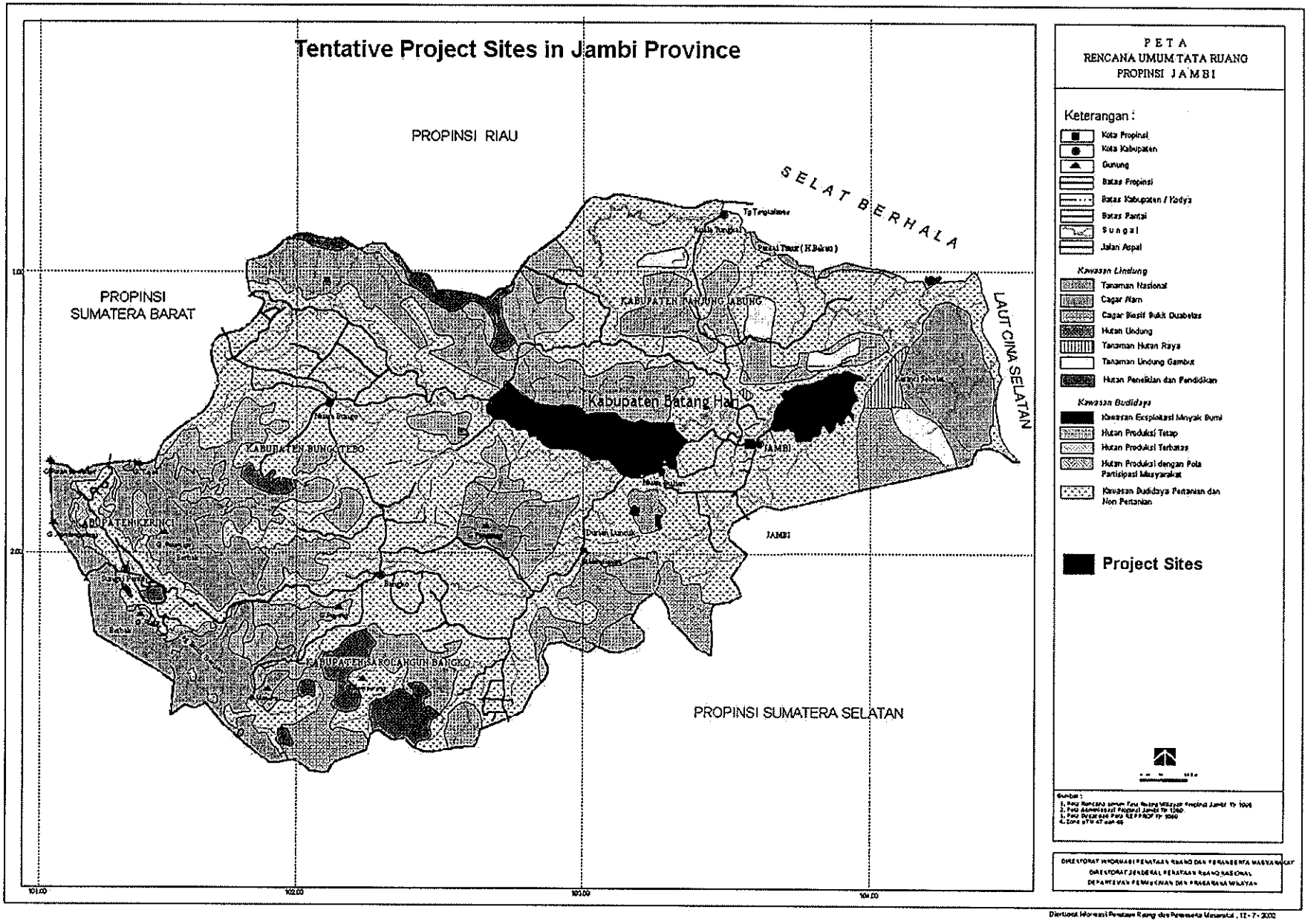
ISWA has implemented ITTO pre-project PPD 57/02 (I) "Improvement of Processing Efficiency of Tropical Timber from Sustainable Sources in Indonesia", which was approved and financed at 33rd session of the ITTC in Yokohama, in November 2002. Its experience in implementing PPD 57/02 will substantially facilitate the required work for the current project.

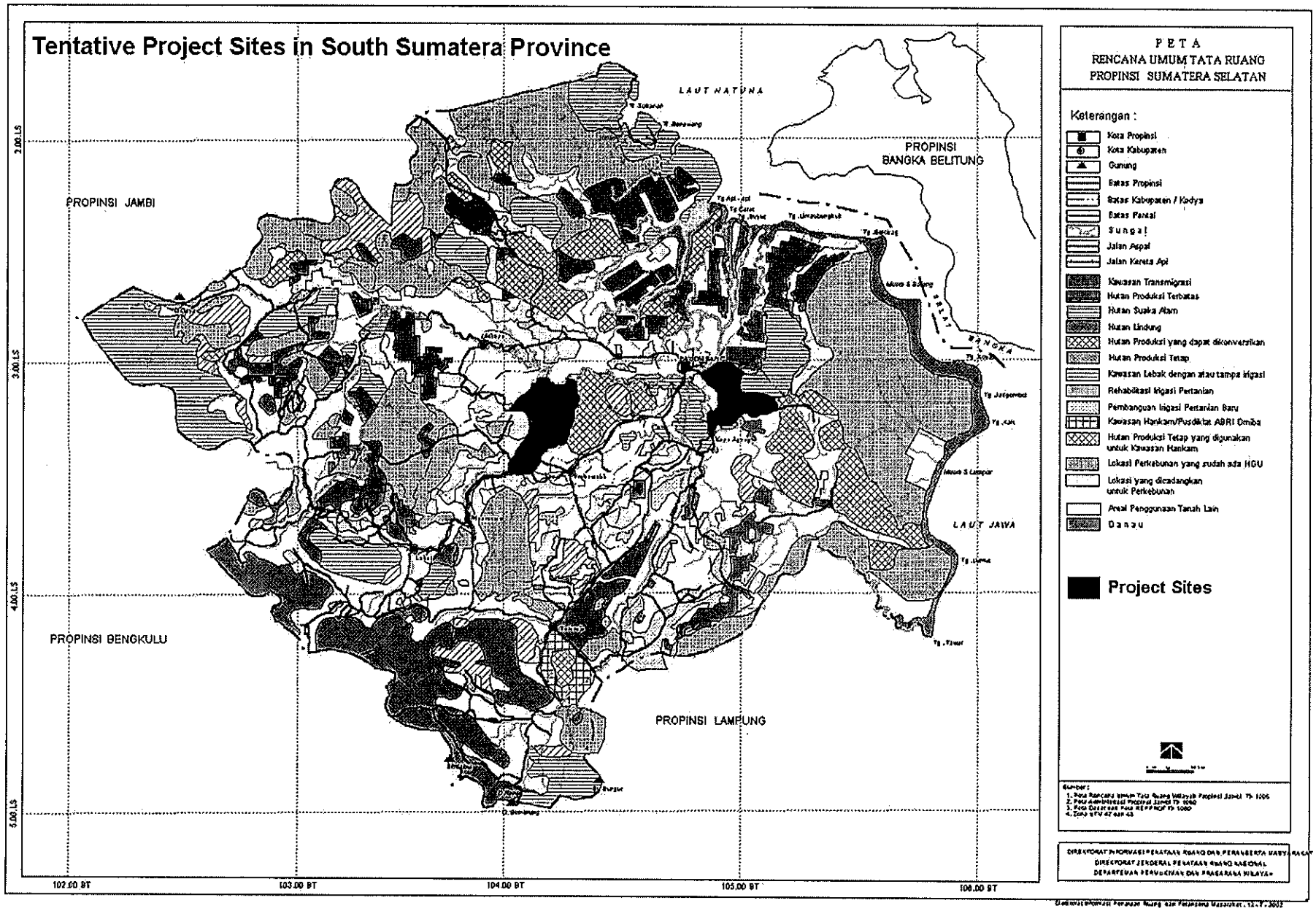
## ANNEX 4 : PROJECT LOCATION MAP

# SUMATERA ISLAND

Location of Project Sites




Tentative Project Sites in Jambi Province
PROPINSI RIAU
SELAT BERHALA
PROPINSI SUMATERA BARAT
KABUPATEN TANJUNG JABUNG
LAUT CINA SELATAN
Kabupaten Batang Hari
KABUPATEN BUNGO TEBO
KABUPATEN KERINCI
JAMBI
KABUPATEN MUSI ROLANGUN BANGKO
PROPINSI SUMATERA SELATAN
PETA
RENCANA UMUM TATA RUANG
PROPINSI JAMBI
Keterangan :
Kota Propinsi
Kota Kabupaten
Gunung
Batas Propinsi
Batas Kabupaten / Kodya
Batas Pantai
Sungai
Jalan Aspal
Kawasan Lindung
Tanaman Nasional
Cagar Alam
Cagar Biosfir Bukit Duabelas
Hutan Lindung
Tanaman Hutan Raya
Tanaman Lindung Gambut
Hutan Penelitian dan Pendidikan
Kawasan Budidaya
Kawasan Eksploitasi Minyak Bumi
Hutan Produksi Tetap
Hutan Produksi Terbatas
Hutan Produksi dengan Pola Partisipasi Masyarakat
Kawasan Budidaya Pertanian dan Non Pertanian
Project Sites
DIREKTORAT INFORMASI PENATAAN RUANG DAN PERANSERTA MASYARAKAT
DIREKTORAT JENDERAL PENATAAN RUANG NASIONAL
DEPARTEMEN PERMUKIMAN DAN PRASARANA WILAYAH


Tentative Project Sites in South Sumatera Province
PETA
RENCANA UMUM TATA RUANG
PROPINSI SUMATERA SELATAN
Keterangan :
Kota Propinsi
Kota Kabupaten
Gunung
Batas Propinsi
Batas Kabupaten / Kodya
Batas Pantai
Sungai
Jalan Aspal
Jalan Kereta Api
Kawasan Transmigrasi
Hutan Produksi Terbatas
Hutan Suaka Alam
Hutan Lindung
Hutan Produksi yang dapat dikonversikan
Hutan Produksi Tetap
Kawasan Lebak dengan atau tanpa irigasi
Rehabilitasi Irigasi Pertanian
Pembangunan Irigasi Pertanian Baru
Kawasan Hankam/Pusdiklat ABRI Dmiba
Hutan Produksi Tetap yang digunakan untuk Kawasan Hankam
Lokasi Perkebunan yang sudah ada HGU
Lokasi yang dicadangkan untuk Perkebunan
Areal Penggunaan Tanah Lain
Danau
Project Sites
LAUT NATUNA
PROPINSI BANGKA BELITUNG
PROPINSI JAMBI
PROPINSI BENGKULU
PROPINSI LAMPUNG
LAUT JAWA
BANGKA
2.00 LS
3.00 LS
4.00 LS
5.00 LS
102.00 BT
103.00 BT
104.00 BT
105.00 BT
106.00 BT

## ANNEX 5 : CV OF KEY PERSONNEL

### CURRICULUM VITAE

| | | |
|---|---|---|
| N a m e | : | **JIMMY CHANDRA** |
| Address | : | Jl. Ternate No. 24, Jakarta 10150<br>Indonesia |
| Phone Number | : | 62.21.6311131 |
| Fax Number | : | 62.21.6304366 |
| Place / Birth Date | : | Pematang Siantar, December 22, 1955 |
| Nationality | : | Indonesian |
| Status | : | Married |
| Education | : | Trisakti University, Faculty of Economics<br>1979 – Graduated S 1 |
| Experience | : | - Motorcycle spare parts manufacturing (1979 – now)<br>- Woodworking and furniture manufacturer for export (1982 – now)<br>- Indonesian Sawmill and Woodworking Association (ISWA) - Board of Director ( 1983 – now )<br>- Forestry Industry Revitalization Agency (BRIK) – Board of Director ( 2002 – now )<br>- ITTO Project PD 286/04 Rev. 1 (I) "Strengthening the Capacity to Promote Efficient Wood Processing Technologies in Indonesia" – Assistant Project Leader |
| Proposed position | : | Project Leader |

## CURRICULUM VITAE

1. **Personal Identity:**

- Name: **Hiras P. Sidabutar**
- Place and date of birth: P. Siantar- Indonesia, 3 August 1945
- Civil status: Married with five children
- Home address: Jalan Abesin No. 71 Bogor 16124 Indonesia
- Contact numbers:
  - Home phone : 62-251-312977
  - Hand phone : 62-0811813724
  - E-mail : hirassidabutar@hotmail.com

2. **Educational Background:**

- 1988: PhD in Forest Resources, University of Washington at Seattle, USA
  Major: Forest Resource Economics
  Minor: Operations Research
- Feb-Jun 1985: enrolled in the Doctoral Program of Bogor Agricultural University majoring in natural resources management (uncompleted, transferred to University of Washington)
- 1984: MSc. in Forest Resources, University of Idaho at Moscow, USA
  Major: Forest Management
  Minor: Forest Sociology
- 1970 Forest Engineer, Bogor Agricultural University at Bogor, Indonesia
  Major: Tropical Forest Ecology, Tropical Silviculture
  Minor: Forest Pests

**3. Occupational Background**

January 2008 - present:
- Freelance forestry consultant
- CTA (Chief Technical Advisor) to ISWA-ITTO Project Project PD 286/04 Rev. 1 (I) "Strengthening the Capacity to Promote Efficient Wood Processing Technologies in Indonesia"

January 2003 - December 2007:
- Worked with the **International Tropical Timber Organization (ITTO)** as the Asia-Pacific Projects Manager for Reforestation and Forest Management. Duties and responsibilities included: i) monitoring tropical forest resources and activities related to their sustainable development; ii) assessment of project and pre-project proposals submitted by Member Countries; iii) monitoring of projects under implementation; iv) evaluation of completed projects and assessment of their impacts; v) provision of advice to Member Countries on matters in the field of Reforestation and Forest Management; vi) preparation of various reports on the work of the Organization in Reforestation and Forest Management; and vii) carrying out other tasks as appropriate;

1998 - 2002:
- Advisor to the **Indonesian Sawmilling & Woodworking Association (ISWA)**, particularly in the promotion of ISWA's international networking. Major tasks were to: i) advise the management on the current situation of international market for wood products; ii) assess overall performance of ISWA members in terms of competitiveness and advise the management on necessary follow up actions; iii) assist the management in the development of strategic action plan; and iv) formulate project proposals for submission to international donors, particularly ITTO, for financial assistance.

- As a free-lance forestry consultant serving the private companies and government organizations in matters related to policy analysis, socio-economic studies and project management.
- Recruited as the national expert on forest industry by the **ITTO Technical Mission to Indonesia** in February-April 2001. The Mission was tasked by ITTO to assist the Government of Indonesia to identify needed ITTO support especially in formulating action plans to achieve sustainable forest management (SFM) in Indonesia. More specifically, the Mission had to: i) assess elements of forest programmes in Indonesia and their actual implementation and identify related shortcomings; ii) assist in formulating pilot programmes to restructure the forest industry, establishing forest plantations, recalculating timber values and decentralizing forest management; iii) assist in formulating action plan with strong measures to combat illegal logging; and iv) prepare and submit a report to ITTO with recommendations for future work in this area. He was tasked to collate and analyze data on the forest industry and prepare a background document in the context of above Mission's tasks;
- Served as the Professor in Strategic Management at the **Jakarta Graduate Schools of the Technological University of the Philippines (TUP)**, and the **Jakarta Christian Krida Wacana University (UKRIDA)**. He was the major advisor to a number of students pursuing Ph.D. degrees in the field of management science at the TUP;

## CURICULUM VITAE

**PERSONAL DATA**

| | |
|---|---|
| Name | : **Diah Herlinawati, SS.** |
| Address | : Jl. Pekayon Rt. 010/03 No. 30 Ragunan Ps. Minggu Jakarta Selatan 12550 |
| Phone | : 021-94293363 |
| Hp | : 081808846874 |
| Place/Date of Birth | : Jakarta, March 06, 1984 |
| Marital Status | : Single |
| Religion | : Moslem |
| Nationality | : Indonesian |

**EDUCATION**

Formal

| | |
|---|---|
| 2004 - 2009 | : Pertiwi School of Foreign Language, Jakarta |
| 1999 - 2002 | : 49 Senior High School, Jakarta |
| 1996 - 1999 | : 107 Junior High School, Jakarta |
| 1990 - 1996 | : MI. Nurul Hidayah Elementary School, Jakarta |

Non Formal

| | |
|---|---|
| 2002 – 2003 | : Secretary and Public Relation in One-year Professional Learning Program at **LBPP-LIA**, Jakarta |

**WORKING EXPERIENCES**

| | |
|---|---|
| 2006-now | : Secretary of ITTO project PD 286/04 Rev. 1 (I) "*Strengthening the Capacity to Promote Efficient Wood Processing Technologies in Indonesia*" |
| 2006 | : Receptionist at **BRIK** (Badan Revitalisasi Industri Kehutanan) Jakarta |
| 2004 – 2006 | : Secretary of PPM (Pusat Penelitian Pengabdian Masyarakat) at **STBA LIA Jakarta.** |

Proposed position : Secretary

## CURRICULUM VITAE

**Personal Data:**

| | | |
|---|---|---|
| Name | : | **Edi Setiarahman** |
| Address | : | Komp. Paspampres, Jl. Belibis II B-8 No.7 RT.011/006 Kel. Kp. Tengah - Kramat Jati, Jakarta Timur 13540 |
| Home Phone | : | 62 (021) 8408022 |
| Office Phone | : | 62 (021) 5703172 |
| Sex | : | Male |
| Religion | : | Moslem |
| Place & Date of Birth | : | Bogor, July 17th, 1967 |
| Marital Status | : | Married, 1 child |
| Health | : | Good (no physical defect) |
| Identification | : | KTP DKI Number: 09.5405.170767.8502 |

**Formal Education:**

| | |
|---|---|
| 1986 - 1993 | Faculty of Forestry, Graduated S-1, Bogor Agricultural Institute (IPB), Bogor |
| 1983 - 1986 | SMA Negeri 4, (Senior High School), Bogor |
| 1980 - 1983 | SMP Negeri 3, (Junior High School), Bogor |

**Professional Experience:**

**April 1994 ~ until present**

| | | |
|---|---|---|
| Employer | : | ISWA (Indonesian Sawmill and Wood Working Association) Jakarta. |
| Position | : | Staff Data Entry (EDP) & Technical of Forestry |
| Responsibility | : | General administrations, data processing, administrative work, technician of the ITTO Project PD 286/04 Rev. 1 (I) "Strengthening the Capacity to Promote Efficient Wood Processing Technologies in Indonesia" involved in Bulletin Publishing and project reporting |

April 2005 ~ until present
Member of the Indonesia National Standard and Technical Committees of Wood and Furniture Products, SNI (Indonesia National Standard).

**Computer Literacy**

Able to operate MS-Windows and its application (MS-Word, MS-Excel, Power Point, Publisher, Photoshop, etc.)

Proposed position : Technical Supervisor

## ANNEX 6 : RESPONSE TO THE OVERALL ASSESTMENT AND SPECIFIC RECOMMENDATIONS OF THE 37TH EXPERT PANEL

**Response to the Overall Assessment and Specific Recommendations of the 37th Expert Panel**

| *No.* | *Recommendations of the 37th EP* | *Response* | *Remarks* |
|---|---|---|---|
| A. | Additional information would further enhance the quality of the project proposal and avoid wrong justification of its importance | Additional information has been provided in the various sections in accordance with the respective specific recommendations | |
| B.1 | Include the Location map of project site in the Project Strategy | The location map of 2 provinces and 4 tentative Districts has been included | Annex 4<br>Page 48 |
| B.2 | Include Universities' role in R & D and not only in policy formulation | Universities are to be included also in R & D and farmer training | Pages 8-9, Table of stakeholder analysis |
| B.3 | Improve the Economic Aspects with data/figure as well as potential revenue resulted from increased utilization of rubber wood resources | Relevant information on potential revenue has been included | Section II 2.6<br>Page 15 |
| B.4 | Elaborate more of the Environmental aspects, including explanation on the stringent criteria used in selecting the preservatives | Requested elaboration and explanation have been included | Section II 2.7<br>Page 16 |
| B.5 | Increase the counterpart budget for the project's personnel and the capital items and reduce the ITTO budget accordingly | ISWA budget increased by US$ 84,480 comprising al budget components except "Consumable Items".<br><br>ITTO budget decreased by US$ 125,210 comprising all budget components but "Consumable Items".<br><br>Total project budget is now reduced to US$ 902,394;US$ 599,694 by ITTO and US$ 302,700 by ISWA/GOI or a total reduction of US$ 40,730 | Tables 7.1 tru 7.4<br>Pages 24 tru 37 |

| *No.* | *Recommendations of the 37th EP* | *Response* | *Remarks* |
|---|---|---|---|
| B.6 | Improve the Work plan with an additional column for responsible parties and align it with its associated budget | The Work Plan has been improved as requested and aligned with its associated budget | Section II 6<br>Pages 22 - 23 |
| B.7 | Elaborate the capital items | The capital items have been elaborated with respect to technical specifications and their future use | Section III 2<br>Page 40 |
| B.8 | Provide an annex which shows the recommendations of the 37th Expert Panel and the respective modification in a tabular form | This particular annex; modifications made are bolded and underlined in the text | |