

# INTERNATIONAL TROPICAL TIMBER ORGANIZATION

## ITTO

### PROJECT DOCUMENT

TITLE	PROMOTING CONSERVATION OF SELECTED HIGH-VALUE INDIGENOUS SPECIES OF SUMATRA
SERIAL NUMBER	PD 710/13 Rev.1 (F)
COMMITTEE	REFORESTATION AND FOREST MANAGEMENT
SUBMITTED BY	GOVERNMENT OF INDONESIA
ORIGINAL LANGUAGE	ENGLISH

#### SUMMARY

Sumatra is one largest island in Indonesia which has abundant biological diversity, including indigenous plant species. Some of those high-value indigenous species are Sumatran yew (*Taxus sumatrana*), Sumatran merbau (*Intsia palembanica*), lesser known non timber forest products (NTFPs) producing species (i.e. *Aquilaria* spp., *Gyrinops* spp., *Gonystylus* spp.), kulim (*Schorodocarpus borneensis*), andalas (*Morus macroura*) and giam (*Cotylelobium melanoxylon*). Over exploitation, encroachment, and other habitat disruption have made those selected high value species threatened to extinction. High commercially valuable timber species such as Sumatran merbau, kulim, andalas, and giam have been excessively and illegally logged for several last decades. Wild-lesser known NTFPs producing species have also been illegally logged for collection. Whereas, endemic and relatively limited distribution and small population size (*T. sumatrana*) has been threatened by habitat encroachment, population disruption and illegal logging. The overall objective of this project is to contribute to the sustainable management, conservation and utilization of high-value Sumatran indigenous species. Specific objective is to improve the achievement of conservation goal through revitalization of the existing conservation and regeneration program, and harvest control of the high-value Sumatran tropical indigenous species.. The expected outputs are (1) The conservation of selected high-value indigenous species accelerated, (2) The harvest control of those species promoted, and (3) Regeneration capacity of those species improved.

#### EXECUTING AGENCY

FOREST RESEARCH INSTITUTE, FORESTRY RESEARCH AND DEVELOPMENT AGENCY (FORDA), MINISTRY OF FORESTRY

#### DURATION

36 MONTHS

#### APPROXIMATE STARTING DATE

TO BE DETERMINED

#### BUDGET AND PROPOSED SOURCES OF FINANCE

Source	Contribution in US\$	Local Currency Equivalent
<b>ITTO</b>	<b>479,976</b>	
Gov't of Indonesia	140,233	
<b>TOTAL</b>	<b>620,209</b>	

## PROJECT BRIEF

The richness of biological diversity in Indonesia has been facing various challenges. Unsound management, unsustainable methods of exploitation and other population and habitat disruption have caused rapid decrease in the population size, distribution, and regeneration capacity of eight high-value Sumatran indigenous species. The other causes are the naturally poor regeneration capacity (genetically) and still lack of realized conservation activities as occur to eight of these Sumatran species (*Taxus sumatrana*, *Intsia palembanica*, *Aquilaria* spp., *Gonystylus* spp., *Gyrinops* spp., *Schorodocarpus borneensis*, *Morus macroura*, and *Cotylelobium melanoxylon*). Decreasing in population size will also reduce potential direct and indirect economic contribution from timber and non-timber forest products (NTFPs) of those species, primarily to local community and other indigenous people. Workshop and other scientific meetings have confirmed the existing threat and recommended some solutions and immediate-necessary field actions.

This proposed project is formulated in response to the above concern. The overall objective of this project is **to contribute to the sustainable management, conservation and utilization of high-value Sumatran indigenous species**. Specific objective is **to improve the achievement of conservation goal through revitalization of the existing conservation and regeneration program, and harvest control of the high-value Sumatran tropical indigenous species.** The expected outputs are (1) The conservation of selected high-value indigenous species accelerated, (2) The harvest control of those species promoted, and (3) Regeneration capacity of those species improved.

Primary beneficiaries of this proposed project are local community, local government, Directorate of Biodiversity Conservation (MoF), Ministry of Environment, BAPPENAS, and Indonesian Institute of Science (LIPI). The benefits range from updated data and information on distribution, the conservation status and protection (conservation), and regeneration for selected high-value indigenous species. This proposed project will also contribute to the socio economic improvement of forest dependent community. By conserving and sustainably harvest of these high-value indigenous species, its contribution to community prosperity and livelihood will also be sustained.

This project will be implemented by Forestry Research Institute (under FORDA) of Kuok, Riau in collaboration with other two Forestry Research Institutes (North Sumatra and South Sumatra).

The project initiated activities (*in-situ* and *ex-situ* conservation sites, seed sources, nursery of selected species and other seed producing stands) will be handed over to Forestry Research Institutes and FORDA central office for continuation. Other finding and updated data and information will be widely disseminated to other relevant stakeholders, such as Directorate of Biodiversity Conservation, local government, Ministry of Environment and BAPPENAS.

The potential risk of this proposed project is the poor participation of stakeholders. This risk will be mitigated through the involvement of stakeholders from the beginning of the project implementation, and the choices of appropriate personnel and institutions. **The other risk is unavailability of planting materials (seeds and seedlings) caused by climate change and inherent physiology traits of the species. This risk will be mitigated through collection of vegetative cuttings from other areas.**

This project requires operational budget of approximately US\$ 479,976 ( $\pm$  40% personnel and 60% operational activities) and the contribution of Government of Indonesia (*in-kind*).

### **List of abbreviation and acronyms**

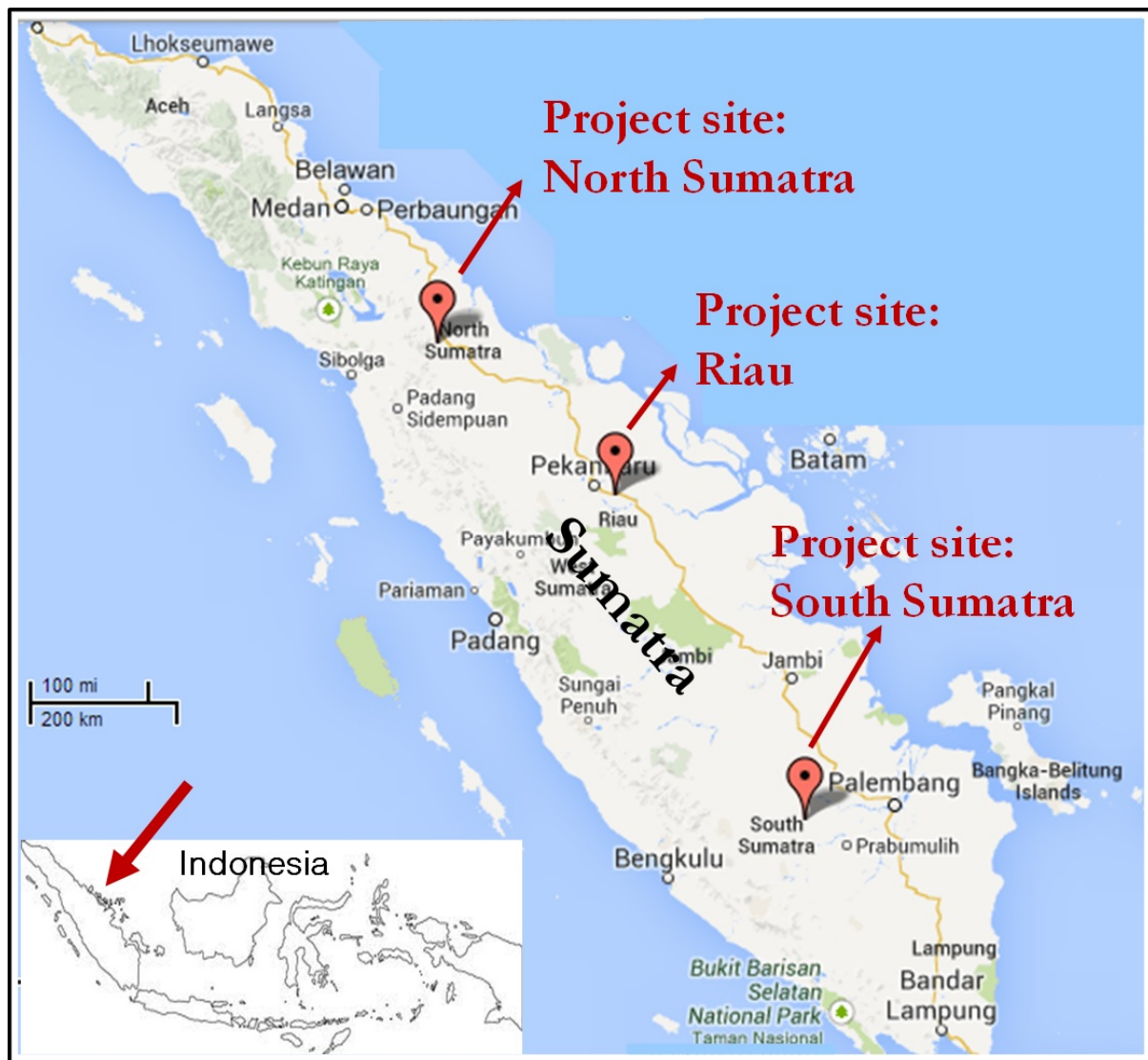
BAPI	Biodiversity Action Plan for Indonesia
BAPPENAS	National Board for Planning and Development
CA	Collaborating Agency
CBD	Convention on Biodiversity
CBTIR	Center for Biotechnology and Tree Improvement Research
CCRRD	Center for Conservation and Rehabilitation Research and Development
CITES	Convention on International Trade in Endangered Species
EA	Executing Agency
FORDA	Forestry Research and Development Agency
FRI	Forestry Research Institute
IBSAB	Indonesian Biodiversity and Strategic Action Plan
ITTA	International Tropical Timber Agreement
ITTO	International Tropical Timber Organization
KLN	Center for International Cooperation
LIPi	National Institute of Science
MoF	Ministry of Forestry
NC	National Consultant
UN MDG	United Nation Millennium Development Goal
WCMC	World Conservation Monitoring Center

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Map of Project Site



## PART 1. PROJECT CONTEXT

### 1.1 Origin

This proposed project is constructed originally from the recommendation made from national and regional workshop on biodiversity conservation. The workshops organized by Ministry of Forestry, Indonesian Institute of Science and National Board for Planning and Development (BAPPENAS), FORDA and Directorate of Biodiversity Conservation (MoF) confirmed the existing threats to the species not only those having high commercial value but also to those genetically and environmentally having barriers to survive and to regenerate. Directorate of Biodiversity Conservation (MoF) in 2008 has developed national strategy for plant and animal conservation as a response to this concern.

However, the strategy and action plan need to be further elaborated for specific species, because (1) Until now, large number of both plant and animal species have been excessively harvested with no immediate action to restore and regenerate, (2) Many of excessively harvested species have been currently under serious threat, including high-value indigenous species, (3) The conservation, vulnerability status and potential regeneration of most of those species are remain unknown.

Threat to species occurs not only in Sumatra but also in other islands. In order to ensure the conservation and to achieve the conservation goal, the necessary actions are needed, which are:

- To immediately update data and information of the species, genetic diversity, vulnerability (natural regeneration capacity), and current habitat and environmental condition;
- To establish physical conservation areas of those selected species and;
- To improve local community prosperity including awareness on the importance of sustainable harvest of those valuable species.

The collaboration with local institutions and organizations is also needed to ensure the conservation and the sustainability. In this proposed project, several interventions are applied to prevent further threat to the extinction through (1) Re-identification and exploration of current population and habitats conditions, (2) Putting priority species and priority action for physical establishment of conservation areas (*in-situ* and *ex-situ*) and potential regeneration and (3) Promotion of sustainable harvest and utilization.

In this proposed project, the issues are addressed to eight genera of Sumatran high-value indigenous tropical tree species. Those genera/species are Sumatran yew (*Taxus sumatra*), Sumatran merbau (*Intsia palembanica*), agarwood producing species (*Aquilaria* spp., *Gyrinops* spp. and *Gonystylus* spp.), high-value timber producing species namely kulim (*Schorodocarpus borneensis*), andalas (*Morus macroura*) and giam (*Cotylelobium melanoxylon*). These species are threatened by habitat destruction, encroachment and relatively small in population (i.e. *Taxus*), naturally small in population size (i.e. *Gonystylus* spp.), by over and unsustainable exploitation (i.e. *Aquilaria*, *Gyrinops*, and *Cotylelobium*), by poor natural regeneration (i.e. *Schorodocarpus* and *Morus*). Brief description of those species are presented below.

*Taxus sumatrana* is evergreen shrub or tree up to 14 m tall and 200 cm in diameter. This species is most valued for Taxol that is extracted from almost all parts of the plant. Taxol is diterpenoids that possess anti-cancer activity, a reason on why this species has been heavily exploited to extinction. In Sumatra, recent study found only small population of *T. sumatrana* left in Kerinci Seblat National Park. This species is threatened, primarily caused by habitat disruption by illegal logging, small size natural population and relatively limited natural regeneration. This species is listed in Appendix II CITES.

*Intsia palembanica* (Miq) de Laub or Sumatran merbau can reach up to 50 m in height and measure up to 150 cm in diameter. This tree is threatened by heavy exploitation for its hard, heavy, good

quality, and luxury wood. Presumably, only limited numbers of merbau trees remain in tropical forest with very limited natural regeneration. *I. bijuga* is listed in IUCN Red List for vulnerable species. However, *I. palembanica* is not found in IUCN list, even though its population apparently has drastically depleted in natural forest. Therefore, a field assessment is critically important to identify the remaining population.

*Aquilaria* spp., *Gyrinops* spp. and *Gonystylus* spp. are agarwood producing species. *Aquilaria* spp. and *Gyrinops* spp. are the primary producer for natural agarwood, while *Gonystylus* spp. produce relatively small quantity of agarwood also a valuable luxurious light hardwood (*G. bancanus*). These species are threatened primarily by heavy and unsustainable method of harvest (searching agarwood by destructive cutting), disruption of habitats, illegal logging and poor natural regeneration. Six species of *Gonystylus* (*G. affinis*, *G. bancanus*, *G. forbesii*, *G. macrophyllus*, *G. maingayi* and *G. velutinus*) are commercially valuable timbers. These species have been heavily depleted throughout their habitat range to fulfill global market's demand. Fifteen species of *Gonystylus* are classified as vulnerable in IUCN red list while all species in genus *Gonystylus* is listed as endangered in Appendix II of CITES. *Aquilaria* spp. and *Gyrinops* spp. have also been listed in Appendix II of CITES.

Kulim (*Schorodocarpus borneensis* Becc) is a multiuse tree, almost all parts of its can be utilized (wood for construction, leaves and fruit for food, and bark for medicine), although the most economically valued is its timber. This species is extensively exploited while in the meantime it has regeneration problem due to seed characteristics and slow growing trait (annual increment only 0.2-0.3 cm). The potency of Kulim is presumed toward extinction that human intervention is needed to ensure the conservation and restoration of its population.

Andalas (*Morus macroura* Miq) is an emblem flora of Sumatra which its other name is Andalas Island. This plant was used to spread at several locations in Sumatra (mostly in West Sumatra), but the natural potency is presumed to deplete. A study in 2006 by Andalas University reported that in X Koto District of West Sumatra found only 205 trees of andalas. This species have been harvested for its good timber. Aside from that, several studies reported that this plant contains chemical compound for anti-microbe, anti-cancer, and inhibit the HIV virus. Heavy exploitation and limited regeneration has caused these species to population depletion and extinction. Aside from that, this plant is also dioecious which mean it has different male and female individual which further adds the complexity of regeneration problems.

Giam (*Cotylelobium melanoxylon*) has hard wood with excellent properties: heavy, strong, and durable. It used to be found in mixed dipterocarp forest; however, nowadays, giam is hardly to find in natural forest. Beside its expensive wood, giam is reported to have anti-diabetic and anti-termite activity. Giam is included in IUCN red list and classified as vulnerable due to heavy extraction.

## **1.2 Relevance**

### **1.2.1 Conformity to the ITTO objectives**

#### **Relevance to ITTA 2006**

The proposed project is relevant to the objectives of ITTA 2006:

- Point *f*: promoting and supporting research and development with a view to improving forest management and efficiency of wood utilization, as well as increasing the capacity to conserve and enhance forest value in timber producing tropical forest.
- Point *j*: encouraging members to support and develop tropical forest reforestation, as well as rehabilitation and restoration of degraded forest land, with due regard for the interest of local communities dependent on forest resources.



- Point *m*: encouraging members to develop national policies aimed at sustainable utilization and conservation of timber producing forest, and maintaining ecological balance, in the context of tropical timber trade.
- Point *q*: promoting better understanding of the contribution of non-timber forest products and environmental services to the sustainable management of tropical forest , etc.
- Point *r*: encouraging members to recognize the role of forest-dependent indigenous and local communities in achieving sustainable forest management and develop strategies to enhance the capacity of these communities to sustainably manage tropical timber producing forest.

This proposed project supports:

- The contribution to the sustainable development and reducing poverty of local community and indigenous people in utilizing timber product and non-timber forest products, especially from the selected species.
- This proposed project is also relevant, because it carries R&D activities to support sustainable management and utilization efficiency of the concerned species.  
This point relevant with ITTA Objective point *f*.
- This proposed project is also relevant in the improvement of utilizing and conserving non-timber value of tropical forest, which are previously exploited in traditional ways, such as on Sumatran merbau, wild agarwoods and other valuable timbers.  
This point also relevant with ITTA objective point *f* and *j*.
- The understanding of non-timber forest products contribution and environmental services in sustainable forest management is also improved through various awareness rising. Support and participation of local and indigenous people and other forest dependent communities on sustainable forest management are expected to increase after receiving training and awareness rising organized by the project.
- Promote and support research and development with focus to improve forest management and efficiency of forest utilization as well as increase the capacity to conserve and enhance other forest values in timber producing tropical forest and the promotion of research and development in forest management.

### **ITTO Strategic Action Plan 2013-2018**

This project is also relevant to the ITTO Strategic Action Plan 2013-2018 with specific to the following aspects:

ITTO Strategic Action Plan No. 3: enhancing the conservation and sustainable use of biodiversity in tropical producing countries,

- Most aspects of this proposed project are addressing the conservation of tropical species, especially those having high economic values, endemic and restricted distribution areas, e.g. *T. sumatrana* and *Gonystylus* spp. Some biological data which have been previously recorded, such as herbarium specimen will be further explored to ensure their conservations.

ITTO Strategic Action Plan No. 4: reduce tropical deforestation and forest degradation and enhance the provision of environmental services,

- The proposed project addresses the high potential loss of species by over harvesting and unsustainable utilization of timber and non-timber forest products. Capacity building especially

for local community and indigenous people will be carried out, primarily for wise use of forest products, sustainable method of harvest, especially on wild agarwood from *Aquilaria*, *Gyryinops*, *Gonystylus* and some other timber producing species. By improving capacity and awareness, over exploitation is expected to decrease, and efficiency of harvest and utilization will improve, the potential threat due to illegal harvest and over exploitation will reduce thus conservation of the species can be realized and achieved.

### **Relevance to ITTO/IUCN Guidelines for Biodiversity Conservation 2005**

The proposed project is highly relevant to ITTO/IUCN Guideline for the Conservation of Biological Diversity in Production Forest (ITTO Policy Development Series No. 5, 1993) and its revision (review and up-date the ITTO/IUCN Guidelines for the Conservation and Sustainable Use of Biodiversity in Tropical Timber Production Forest, 2005). In guideline 2: Biodiversity goals and targets for tropical production forest should be developed with the involvement of all relevant stakeholders with particular attention to the needs and priorities of local communities. Species like *Aquilaria* and *Gyryinops* produce natural wild agarwood which are also the sources of income for local and indigenous people by using traditional way. This proposed project will contribute in the improvement of harvesting methods and their utilization.

### **Relevance to other global issues**

This proposed project is also relevant to the CBD 2010 and 2020 Target which is “to achieve significant reduction of the current rate of biodiversity loss at the national level”, and the CITES Strategic Plan which state that “No species of wild flora (fauna) subjected to unsustainable exploitation because of international trade”.

#### **1.2.2 Relevance to the policies of Indonesia**

The outputs of this proposed project are to accelerate the conservation, the sustainable harvest and to improve natural and artificial regeneration of those high-value selected species. Therefore, this proposed project is highly relevant to the national priorities to conserve biological diversity, to achieve sustainable management of tropical forests, community development and to take part in addressing the current global issues (CBD and CITES).

The country's priority programs of Ministry of Forestry (2010-2014) are to achieve the sustainable management of tropical forests, conservation and community development. There are three out of six MoF's specific priority programs in which this project could contribute to:

- Biodiversity conservation,
- Revitalization of forest utilization and forest industries,
- Empowerment of forest local communities.

This proposed project is also relevant to the ultimate objective of conservation of biological diversity by Directorate of Biodiversity Conservation, Directorate General of Forest Protection and Nature Conservation (DG PHKA): to achieve self-sufficient management of conservation areas, conservation of biological diversity, ensuring state rights on state areas and forest products, and increasing state revenue and community income from natural conservation activities.

This proposed project is also relevant and will contribute to the achievement of program under the Indonesian Biodiversity and Strategic Action Plan (IBSAP) 2003-2020 on the management of biological diversity, including all important lesser known species in Indonesia.

## 1.3 Target Area

### 1.3.1 Geographical location

The geographical area for this project is Sumatra (see Map of Project Site). This island lies diagonally from northwest to southeast in the equator (00°N and 102°E). The island which is located in the western Indonesia has tropical wet climate, bordered by Indian Ocean at the west, northwest and southwest; and Java sea at the eastern side. Bukit Barisan mountain elongates from northern to southern of the backbone of the island with several active volcanoes. The island has lowlands with swamps, mangrove and complex river systems at the northeast side. Administratively, Sumatra is divided into ten provinces, eight of ten are in the mainland and two provinces are islands in the eastern side.

Sumatra is one of the largest islands which have abundant species of flora and fauna in various habitats from coastal, peat swamp, lowland until hill-mountain forest. However, forests in Sumatra are facing several conditions as follows:

- Sumatran Forest including its biological diversity are facing serious threats due to various disturbance (conversion, fires, and illegal logging),
- The relatively high population density which cause increasing pressure to the natural resources,
- Most potential and commercially species have been heavily exploited,
- Some plant species have been predicted to be under serious threat close to extinction,
- Some plant species are endemic to Sumatra (e.g. *T. sumatrana*),
- The selected species addressed in this proposed project are naturally distributed from the northern tip to the southern most of the island.

The project sites represent the natural distribution of each species in which *in-situ* and *ex-situ* conservation will be established and or expanded. Giam and kulim will be explored and its conservation will be established in Riau Province, andalas will be in West Sumatra province, Sumatran Yew will be in Kerinci Seblat National Park, Sumatran merbau will be in South Sumatra or elsewhere. NTFPs producing species (*Aquilaria*, *Gyrinops*, and *Gonystylus*) are targeted in West Sumatra and Riau. The *in-situ* and *ex-situ* conservation sites will be established for selected species in the representative area suitable for those species supervised by collaborative institutions. Genetic material of all targeted species will be collected, recorded and kept in capable institutions.

### 1.3.2 Social cultural, economic, and environmental aspects

#### (a) Social cultural aspects

Sumatra island is inhabited mostly by Malay origin. Several tribes, such as Talang Mamak, Kubu, Anak Dalam, etc. reside in its natural forests whose livelihood is very dependent on forest resources. These tribes hunt and gather their food from various vegetation and other non-timber forest product.

The local community in Sumatran are mostly farmers, fisherman, and traders, other than those tribes. Various plant species are having economic and traditional values to community. The harvest of the species has given contribution not only to local but also to regional economy. Nearly 60% of local community living in surrounding forest area receives direct and indirect benefits from these resources including various types of timber and non-timber forest products. In early stage of national development, timber resources have been one of primary source of national revenue. Later, other non-timber forest products (NTFPs) are also harvested and have contributed to community prosperity. Due to the excessive harvest and other natural disturbances, the contribution to the community prosperity decreased, thus, urgent intervention is needed to conserve, protect and restore to original

condition, through improving management practices, protection, field conservation action, and regeneration. This proposed project is intended to ensure their conservation and sustainable production, which also bears impacts to socio economic of local community and others whose life is dependent on forest.

#### **(b) Economic aspect**

Economic value of the existing plant species has been recognized by local community. Sumatran merbau, kulim, andalas and giam are examples of high value commercial timbers which have been cut several decades ago. Whereas, non-timber forest products (e.g. medicine and perfume from wild agarwood, lesser known agarwood, Sumatran yew and kulim) have also been recognized for the economic value. Since they are not openly traded, the information on the trade value and quantity is still lacking. The great reduction in population of these tree species will reduce its contribution to the local community, which is contradictive to the goal of GCB challenge to prevent further loss and degradation of biodiversity to human prosperity and welfare.

#### **(c) Environmental context**

Forest degradation, encroachment and conversion to other uses have resulted in great reduction on natural resources and forest quality. This rapid reduction influenced community prosperity, which also resulted in increase of pressure to forest resources, environmental quality and ecosystem function. This condition will intensify if no any necessary intervention is taken. This proposed project will improve environmental condition by maintaining the biodiversity and by enhancing the achievement of sustainable management and conservation of those plant species. **The establishment of *in-situ* and *ex-situ* conservation, as well as the improvement of forest stands will ameliorate natural resources that will also significantly improve environmental quality and further will improve community prosperity which in turn, will reduce pressure to the existing natural resources, especially plant genetic materials for the above threatened and other lesser known species**

### **1.4 Expected outcomes at project completion**

At project completion, it is expected that several aspects below are achieved:

#### **Immediate effects and benefits:**

- The latest data and information on the status of the harvested, threatened and potentially threatened species, including the use of IUCN Red List vulnerability criteria. The data also includes information on biological, ecological impact of excessive harvest and genetic (diversity and erosion).
- Improved capacity on harvest methods and increased awareness on species conservation and protection.
- Improves existing *In-situ* conservation for selected species
- Initiated establishment for *ex-situ* conservation for selected species.
- Formulated conservation strategies for selected species.
- Improved regeneration capacity through the improvement of seed sources, seed production and handling.
- Initiated establishment of seed sources for improving regeneration capacity.

By the presence of the necessary conditions, thus conservation, sustainable harvest and regeneration of the selected species will be improved and contribution of this proposed project toward the sustainable management, utilization and regeneration of the species will be realized.

By obtaining data and information on biological and ecological impacts as well as the level of vulnerability, the conservation and protection strategy could be developed. The conservation and sustainable management will bring continuous benefit to the community, local government, Ministry of Forestry, Ministry of Environment, BAPPENAS, Indonesian Institutes of Science (LIPI) and other research institutions.

The benefits will be delivered through various meetings, seminars, national and regional workshops and FORDA publication which will be carried out and produced as part of the project operational activities. Findings will also be uploaded to FORDA and MoF websites.

## **PART 2. PROJECT RATIONALE AND OBJECTIVES**

### **2.1 Rationale**

#### **2.1.1 Institutional Set-up and Organizational Issues**

Indonesia has ratified Convention of Biological Diversity (CBD). Implementation of this convention is coordinated under the Ministry of Environment and is supported by Ministry of Forestry and National Institute of Science and other relevant institutions. Directorate General of Forest Protection and Nature Conservation (MoF) has responsibilities to ensure the protection and conservation of natural forests including its biological diversity (ecosystems, habitats, species, and gene resources). Forestry Research and Development Agency (FORDA), also under MoF, has responsibility to provide updated scientific data and information on most aspects of biodiversity, to develop necessary techniques and methods to protect and conserve natural forests and its biological diversity, which assist the achievement of MoF programs on the conservation of biological diversity. To achieve the objectives of the program, FORDA and its regional Forestry Research Institutes collaboratively with other relevant research institutions, universities, NGO, and local stakeholders.

In the implementation of these project activities, FORDA shares the responsibilities to its three regional Forestry Research Institutes (FRI), FRI of North Sumatra, FRI of Kuok Riau, and FRI of South Sumatra. **FRI of Kuok will be the executing agency and will coordinate other institutions and partners in the implementation of project activities.** In this implementation, **the FRI of Kuok (FORDA)** will work closely with DG of Forest Protection and Nature Conservation, provincial governments, and other relevant institutions **which have adequate capacities and facilities such as reservation forest, experimental forest, laboratory, etc.** The overall project findings and outputs are disseminated and coordinated by FORDA to primarily use in local communities, other relevant institutions, and MoF.

**The FRIs (Kuok, North Sumatra, and South Sumatra) are responsible institutions for collecting data and information, conducting research and development and conserving plant genetic resources in each geographical region. The work of each FRI is in accordance with the distribution area of targeted species and the working area of each FRI. The Implementation will involve Provincial/District Forest Services, Universities and other relevant institutions, such as Regional Forest Protection and Nature Conservation. Observation of genetic diversity and vulnerability of selected species will be executed by competent institution, Center for Biotechnology and Tree Improvement (CBTI). Whereas Center for Conservation and Rehabilitation Research and Development (CCRRD) will involve in developing method and strategy to conserve and sustainably harvest each species including developing technical guideline for sustainable harvest and materials handlings.**

#### **2.1.2 Stakeholder analyses**

##### **Stakeholder identification and consultation**

Stakeholders involve in the implementation of this proposed project are local communities, provincial and district government, Forestry Research and Development Agency (FORDA), FRI of North Sumatra, FRI of Kuok Riau, FRI of South Sumatra, Indonesian Institute of Sciences (LIPI) and Directorate of Biodiversity Conservation. Other relevant institutions include Ministry of Environment as focal point of CBD, National Board for Planning and Development (BAPPENAS), Universities and NGOs.

Consultation meeting organized by FORDA regarding the conservation of biological diversity confirmed the urgency for taking immediate intervention to protect, conserve and restore species

population. All stakeholders support the submission of this proposal by providing all necessary documents, data and information.

**Table 1. The involvement of various stakeholders in the project implementation**

Stakeholders group	Characteristics	Problems, needs, interests	Potentials	Involvement in the project
<b>Primary stakeholders</b>				
1. Local communities	Users of forest resource for wider range of purposes	Lack of knowledge and skill	- Sources of labors - Familiar with the sites and habitat	- Labors - Involve in keeping and site monitoring
2. Provincial/ District forest services	Responsible for managing forest resources in their area	Lack of capacity in providing necessary data	Facilitate any implementation activities	Involve in coordinating the implementation of the activities
3. Regional forestry research institutes in Sumatra	- Responsible for supporting recent scientific data and information at regional level - Play an important role in conducting research and development at regional level	- Limited resources and capacity to execute field data collection of species in each area	Having facilities and research sites	Involve in implementing project activities and results
<b>Secondary stakeholders</b>				
4. Directorate of Biodiversity conservation	Promote strategies for long term conservation and sustainable utilization of various species	Limited capacity to collect and update data and information including on wild life protection and utilization	Disseminate data and information of the findings	Facilitate information dissemination
			-	
5. Indonesian Institute of Science, Center for plant conservation	Responsible for scientific assessment on natural resources including plant and animal species	Limited access to forest resources	- Scientific community - Assist in analysis of biological diversity	Involve in various scientific meetings and discussions
8. Ministry of Environment/ BAPPENAS	Involve in setting the national programs for conservation of biological diversity	Limited mandate to directly collect and update data and information	Facilitate the implementation of project findings	Involve in dissemination and analysis of findings
7. Universities	Involve in the R&D on forestry resources, capacity building and awareness raising	Limited access on R&D activities, awareness raising and capacity building	Having facilities and resources	Involve in scientific meetings and discussions
8. NGO	Facilitate community awareness raising and prosperity	Involve in information dissemination and communication with communities	Close collaboration with communities	Dissemination and other awareness raising

### 2.1.3 Problem analysis

Forest degradation in Sumatra is in alarming rate. Significant decrease of forest cover and high rate of forest degradation have caused potential loss of biodiversity in this island. The high risk for lost occurs to species having commercial value, naturally limited in population size, limited capacity for artificial and natural regeneration due to genetic characteristics and or disrupted population structure.

#### Ineffective conservation measures

Recorded herbarium specimens revealed that certain species are growing genetically and naturally in relatively small population size and live in certain habitat types. This occurs on Sumatran yew (*T. sumatrana*) and most species of *Gonystylus* (*G. affinis*, *G. macrophyllus*, *G. maingayi*, and *G. velutinus*). Sumatran yew is currently threatened by habitat disruption and encroachment and all *Gonystylus* species have been listed and classified as vulnerable in IUCN Red list criteria and as endangered species in Appendix II of CITES. *Aquilaria* and *Gyrynops* are also listed in Appendix II of CITES. However, even though those species are under serious threats and having potential to extinct, no effective measures have been taken to enhance the immediate protection and conservation. This ineffective conservation measures are caused by lack of awareness by both local community and concerned stakeholders (including authority), lack of updated data and information to accurately formulate the protection and conservation strategy and lack of effective conservation techniques and guidelines for each individual species.

Lack of updated data and information on the current status of those species has made it difficult to accurately formulate the method and technique to protect and conserve each species, even though the general guideline and action plan have been formulated by Directorate of Biodiversity Conservation (MoF). Current conservation of those species still relies on the existing *in-situ* conservation in nature (wildlife) reserve, national park, and other type of conservation areas.

#### Excessive harvest

Reports have indicated that the excessive harvest has narrowed the population size of some species as occurred on Sumatran merbau (*Instia palembanica*), kulim (*Schorodocarpus borneensis*), andalas (*Morus macroura*), and giam (*Cotylelobium melanoxydon*). This group of species is exploited excessively not only in production forests but also in conservation areas, i.e. national parks and nature reserves. The over harvest is driven by high economic value, primarily from their wood quality and features for heavy construction (outdoor and indoor application) and some fancy panels. Natural agarwood (i.e. *Aquilaria* spp., *Gyrynops* spp.) and lesser known agarwood locally known as gaharu buaya (*Gonystylus* spp.) are having economic value for its chemical substances (incenses) used for various perfumeries and medicines. This unsustainable harvest is mostly caused by weak law enforcement on the existing rule and regulations, lack of knowledge and skill, and lack of available guidelines and techniques for sustainable harvest for each species.

#### Lack of regeneration capacity

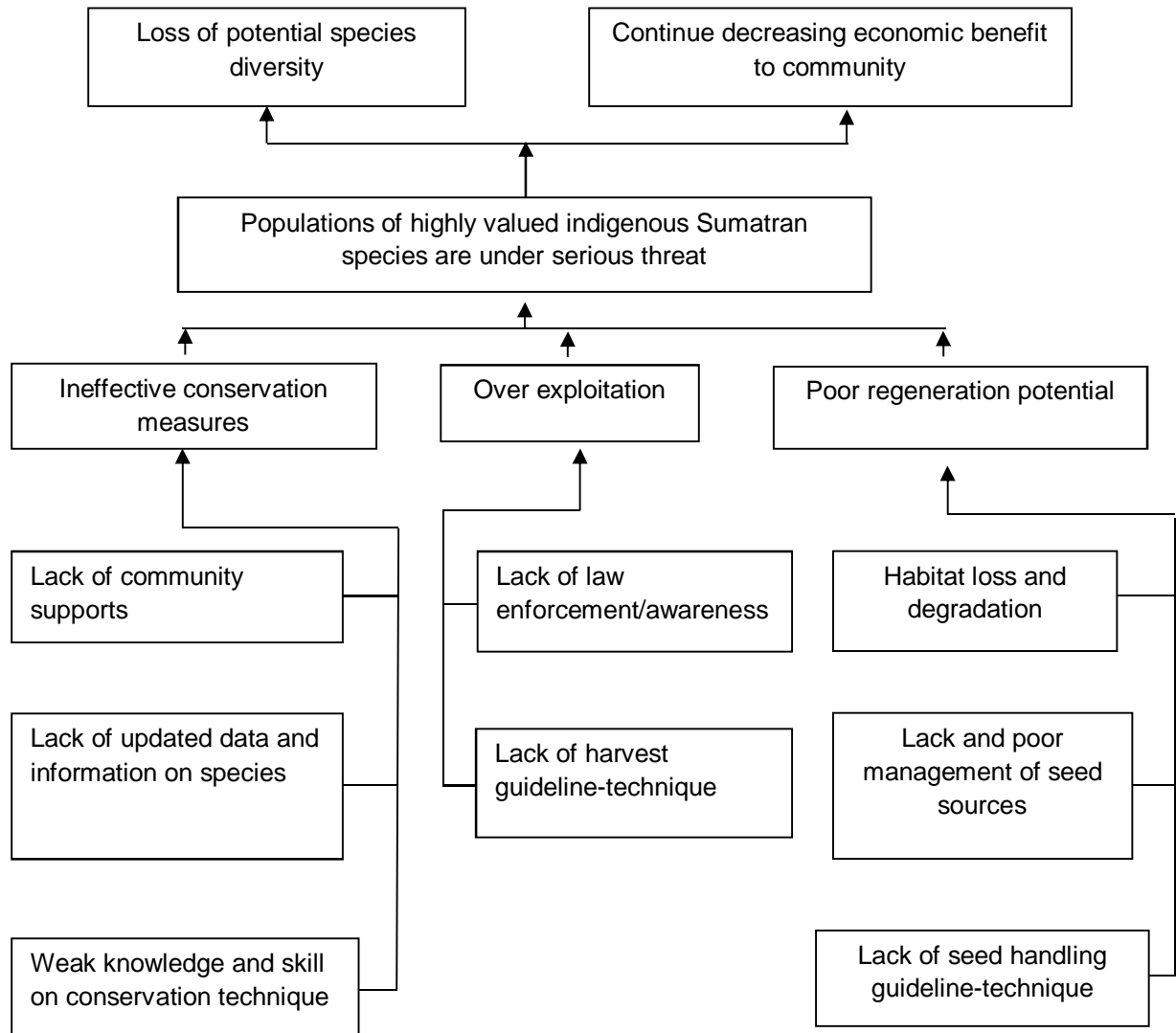
The significant decrease in population size and potential loss is also caused by genetic or biological characteristics of each species. Individual species is mostly affected by disruption of population structure. Most of *Gonystylus* species and *I. palembanica* are example of this problem. Those species failed to produce adequate quantity of seeds due to significant decrease on population number and disruption of population structure. On the other hand, until today there are no areas, stands, and even mother tree have been legally selected, designed and managed for seed sources and seed production areas.

Species from genera *Aquilaria*, *Taxus*, and *Intsia* are example of species that in normal and good habitat condition flower annually and show a distinct peak flowering-fruiting season, and commonly

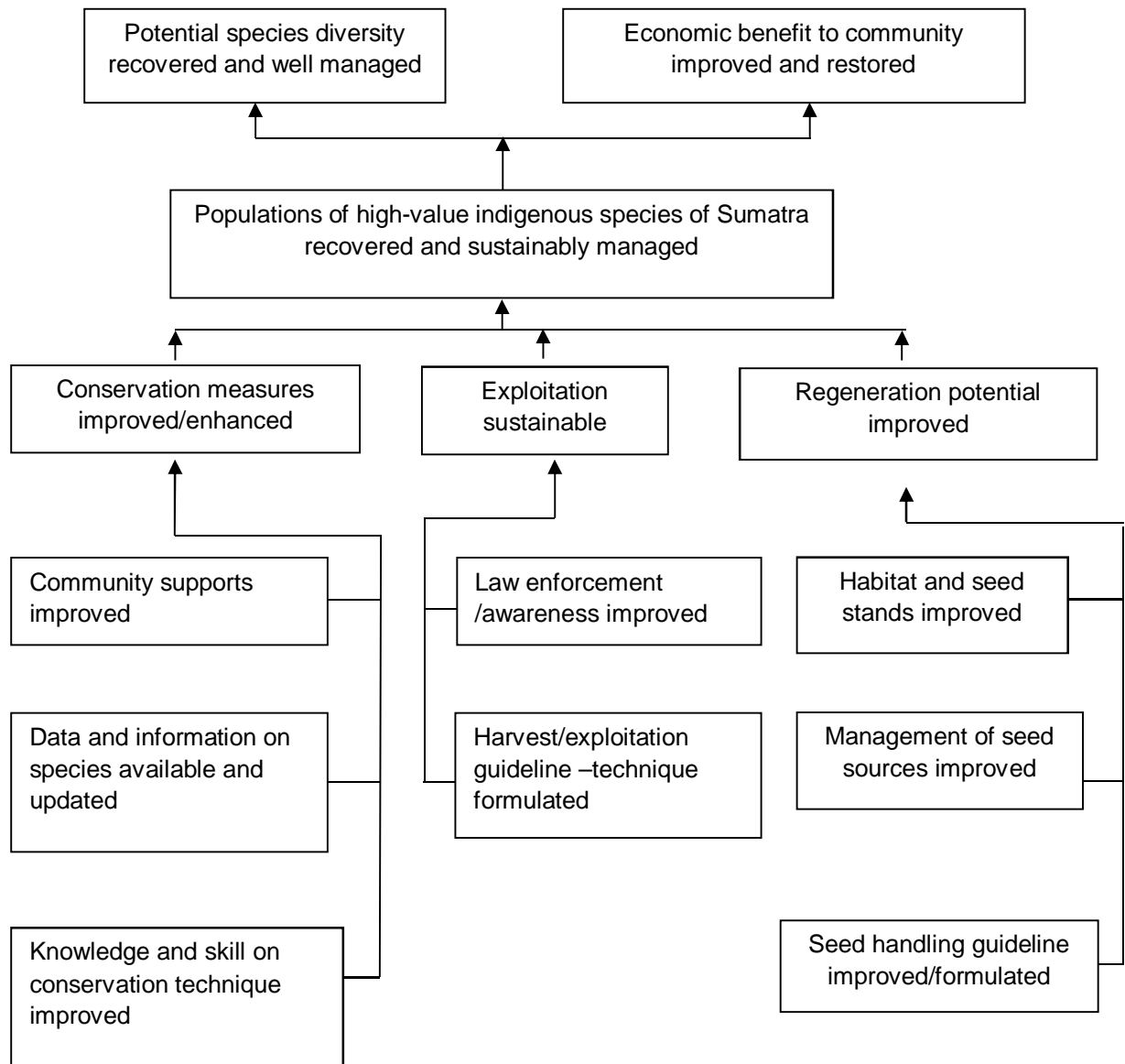


produce large quantity of seeds at the peak of flowering season. Reduce population size and disruption of stands and habitats has caused decreasing seed production and decreasing natural and artificial regeneration of the species. On the other hand, the above species are lacking seed sources and seed production areas. Proper guidelines for seed source management, stand management, seed handling and method for mass production of planting materials are also unavailable.

**Figure 2. Problem tree**



**Figure 3. Objective (solution) tree**



## 2.1.4 Logical framework matrix

Project Elements	Indicators	Means of verification	Assumption
<b>Development Objective:</b>  <u>To contribute to the sustainable management of conservation and utilization of high-value Sumatran indigenous species</u>	<ul style="list-style-type: none"> <li>- Four <i>ex-situ</i> conservation, one for each selected species, established</li> <li>- The harvest of selected species is sustainably controlled</li> <li>- Seed sources of selected species, established and well-managed</li> <li>- The selected stands for future seed sources are intensively managed</li> <li>- Relevant stakeholders actively involved in the implementation of conservation activities</li> </ul>	MoF Report, Provincial/District Report	Consistent support from concerned authorities for species conservation
<b>Specific objective:</b>  <u>To improve the achievement of conservation goal through revitalization of the existing conservation and regeneration program, and harvest control of the high-value Sumatran tropical indigenous species</u>	<ul style="list-style-type: none"> <li>- Four <i>ex-situ</i> conservation areas identified and initially established</li> <li>- Conservation guideline and measure formulated</li> <li>- Sound harvesting guideline formulated and delivered</li> <li>- One seed sources for each species are identified, legally regulated and initially established</li> <li>- Seed source management guideline developed</li> <li>- Handling technique of seeds and wildlings developed</li> <li>- 20-30 local communities trained and awareness raised on law/regulation</li> </ul>	<ul style="list-style-type: none"> <li>- Project report</li> <li>- FORDA report</li> <li>- MoF Report</li> </ul>	Relevant parties provide support
<b>Output 1. Conservation of selected high value indigenous species accelerated</b>	<ul style="list-style-type: none"> <li>- 30 participant of training/awareness raising</li> <li>- Updated biological data/information</li> <li>- 1 Formulated conservation strategies for each species</li> <li>- 2 ha <i>ex-situ</i> conservation of each species established</li> </ul>	<ul style="list-style-type: none"> <li>- Training report</li> <li>- Field report</li> <li>- Concept of conservation method/strategies</li> </ul>	<ul style="list-style-type: none"> <li>- stakeholders are willing to participate</li> <li>- locations are accessible</li> </ul>
<b>Output 2. The harvest control of those promoted</b>	<ul style="list-style-type: none"> <li>- a developed harvest guideline</li> <li>- 30 trained participants on law and harvest regulation</li> </ul>	<ul style="list-style-type: none"> <li>- Training report</li> <li>- Guideline of harvest</li> </ul>	relevant parties are willing to participate
<b>Output 3. Regeneration capacity of those selected species improved</b>	<ul style="list-style-type: none"> <li>- 2-3 sites of seed sources for each species identified,</li> <li>- 1 developed handling guideline/method of seed and seedling</li> <li>- 1-2 improved seed sources/stand</li> <li>- 1-2 initiated nurseries for selected species</li> </ul>	<ul style="list-style-type: none"> <li>- Report of seed sources identification</li> <li>- Guideline/ method of seed handling</li> <li>- Field activity report</li> </ul>	seed/seedling materials are available

## 2.2 Objectives

### 2.2.1 Development objectives and impact indicators

#### Development objectives:

The overall objective of this project is **To contribute to the sustainable management, conservation and utilization of high-value Sumatran indigenous species.**

#### Impact indicators:

3-5 years after project completion:

- Four *ex-situ* conservation, one for each species, established,
- The harvest of the selected species is sustainably controlled,
- Seed sources of selected species established and well-managed,
- The selected stands for future seed sources are intensively managed,
- Relevant stakeholders actively involved in the implementation of conservation activities.

### 2.2.2 Specific objectives and outcomes indicators

#### Specific objective:

Specific objective is **to improve the achievement of conservation goal through revitalization of the existing conservation and regeneration program, and harvest control of the high-value Sumatran tropical indigenous species.**

#### Outcomes indicators

At project completion:

- Four *Ex-situ* conservation, one for each species, identified and initially established,
- Conservation guideline and measure for each selected species formulated,
- Sound harvesting guideline for each species formulated and delivered,
- One seed sources for each selected species are identified, legally regulated and initially revitalized,,
- Management guideline for seed sources of each species developed,
- Handling technique of seed and wildling developed,
- 20-30 local communities are trained on harvest protocol and awareness raised on law/regulation,

## PART 3. DESCRIPTION OF PROJECT INTERVENTION

### 3.1 Outputs and activities

#### 3.1.1 Outputs

##### **Output 1. Conservation of selected high-value indigenous species accelerated**

Indicators:

- 30 participants of awareness raising trained
- Updated biological data/information on the species available
- 1 conservation strategies for each species formulated
- 4 *ex-situ* conservation each 2 ha for selected species initiated and developed

##### **Output 2. The harvest control those species promoted**

Indicators:

- Harvest guideline developed
- 30 participants on law and harvest regulation trained

##### **Output 3. Regeneration capacity of those species improved**

Indicators:

- 2-3 sites of seed sources for each species identified
- 1 developed handling guideline/method of seed and seedling
- 1-2 improved seed sources/stands
- 1-2 initiated nurseries for selected species

#### 3.1.2 Activities

##### **Output 1. Conservation of selected high-value indigenous species accelerated**

- Activity 1.1 To improve knowledge and awareness on the importance of species conservation
- Activity 1.2 To collect and update biological and ecological data and information on the selected species
- Activity 1.3 To observe genetic diversity and vulnerability of the selected species
- Activity 1.4 To develop suitable method and strategy for conservation of each selected species based on result of activity 1.2. and 1.3
- Activity 1.5 To establish and revitalize *in-situ* and *ex-situ* conservation of selected species

**Four *ex-situ* conservation areas 2 ha each will be establish for selected species. Based on the update biological and ecological information (activity 1.2), four critical or important species will be selected for the establishment of *ex-situ* conservation. Meanwhile, the enrichment planting will be carried out to improve the existing stands in *in-situ* conservation area inside or outside the original habitat with considering their ecological and environmental aspects. This enrichment planting and establishment of *ex-situ* conservation will use planting materials resulted from activity 3.2.**

## **Output 2. The harvest control of those species is promoted**

- Activity 2.1 To carry out workshop and awareness raising on law enforcement on forest harvest.
- Activity 2.2 To develop technical guideline and method for sustainable harvest of selected species.
- Activity 2.3 To carry out analyses for potential uses of chemical substances of Sumatran yew (*T. sumatrana*).

## **Output 3. Regeneration capacity of those selected species improved**

- Activity 3.1 To explore and identify potential seed sources for selected species
- Activity 3.2 To collect seeds, wildlings and other vegetative materials to be grown in nursery

This activity is carried out to support Activity 1.5 in providing planting materials for enrichment planting in the existing stands of *in-situ* conservation (Activity 3.3) and to initiate the establishment of new *ex-situ* conservation of selected species.

- Activity 3.3 To carry out enrichment planting in selected *in-situ* conservation areas of selected species.

## **3.2 Implementation approached and methods**

This proposed project is intended to solve problems related to the weak conservation efforts of selected high value indigenous species, the uncontrolled or excessive harvest and poor artificially and naturally regeneration capacity. It is expected that the enhancement of conservation, sustainably controlled harvest and improved regeneration will be achieved. In order to achieve those objectives, several approach and methods will be taken as follows:

- To organize intensive discussions and scientific meetings involving concerned stakeholders and local community on taxonomical status, biology, harvesting methods/guidelines and conservation possibilities of selected species,
- To carry out training/awareness rising of rules and regulation on forest product (including NTFPs) harvest to prevent excessive and unsustainable harvest, primarily for local community
- To carry out field survey to identify and to revitalize existing *in-situ* and *ex-situ* conservation sites and seed sources,
- To carry out enrichment planting in some selected areas for conservation and seed sources,
- To enhance capacity of institutions and community through the development of guideline,
- To update biological and ecological data and information of all species,
- To identify personnel and sustainability measures for continuation of project initiated activities,
- To hold a preparatory meeting prior to implementation of activities to ensure the involvement of key stakeholders.

### 3.3 Work Plan

**Table 3. Work plan of the project**

Outputs/Activities	Responsible parties	Year 1				Year 2				Year 3			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
<b>Output 1. The conservation of selected high value indigenous species accelerated</b>													
Activity 1.1. To improve knowledge and awareness on the importance of species conservation	FRIs												
Activity 1.2. To collect and update biological and ecological data and information on the selected species.	FRIs												
Activity 1.3. To observe genetic diversity and vulnerability of selected species	CBTI												
Activity 1.4. To develop suitable method and strategy for conservation of each selected species based on result of activity 1.2. and 1.3	CCRDR-Bogor												
Activity 1.5. To establish and revitalize <i>in-situ</i> and <i>ex-situ</i> conservation of selected species	FRIs												
<b>Output 2. The harvest control of those species promoted</b>													
Activity 2.1. To carry out workshop and awareness raising on law enforcement on forest harvest.	FRIs												
Activity 2.2. To develop technical guideline and method for sustainable harvest of selected species.	CCRDR-Bogor												
Activity 2.3. To carry out analyses for potential uses of chemical substances of Sumatran yew ( <i>Taxus sumatrana</i> )	CCRDR-Bogor												
<b>Output 3. Regeneration capacity of the those selected species improved</b>													
Activity 3.1. To explore and identify potential seed sources for selected species	FRIs												
Activity 3.2. To collect seeds, wildlings and other vegetative materials to be grown in nursery	FRIs												
Activity 3.3. To carry out enrichment planting in selected <i>in-situ</i> conservation stands of selected species.	FRIs												

Abbreviations: CCRDR-Bogor (Center for Conservation and Rehabilitation Research and Development-Bogor), FRIs (regional Forestry Research Institutes of Riau, North Sumatra, South Sumatra), CBTI (Center for Biotechnology and Tree Improvement-Jogjakarta).

### 3.4 Budget

#### 3.4.1 Master Budget

Outputs and Activities	Description	Budget Component	Quantity			Units	Unit Cost	Total Cost	ITTO			EA
			Year 1	Year 2	Year 3				Year 1	Year 2	Year 3	
Output 1. Conservation of selected species accelerated												
Activity 1.1. To improve knowlegde and awareness on the importance of maintaining sustainable utilization of selected species	1). Workshop package (accomodation and organization)	63	1	0	0	Package	3.000	3.000	3.000	-	-	-
	2). Return Tickets	32.1	6	0	0	Participant	250	1.500	1.500	-	-	-
	3). Daily Subsistence Allowance	31.1	40	0	0	Participant	50	2.000	2.000	-	-	-
	4). Local Transport	33.1	40	0	0	Participant	35	1.400	1.400	-	-	-
	5). Printing report and editing	64	1	0	0	Package	1.500	1.500	1.500	-	-	-
Sub total Activity 1.1.							9.400	9.400	-	-	-	-
Activity 1.2. To collect and update data and information on the distribution, population and conservation status of the species	1). National Expert	11.2	3	3	0	Person-month	1.000	6.000	3.000	3.000	-	-
	2). Technician	12.2	2	2	0	Person-month	350	1.400	700	700	-	-
	3). Other labors	12.4	90	0	0	Person-day	15	1.350	1.350	-	-	-
	4). Local Transport	33.2	15	0	0	Trip	200	3.000	3.000	-	-	-
	5). Daily Subsistence Allowance	31.2	80	0	0	Person-day	80	6.400	6.400	-	-	-
	6). Office Supplies	53	0,5	0,5	0	Package	500	500	250	250	-	-
	7). Materials	51	1	0	0	Package	500	500	500	-	-	-
	8). Fuel and Utilities	52	0,75	0,25	0	Package	500	500	375	125	-	-
	9). Other consumable items	54	1	1	0	Package	500	1.000	500	500	-	-
	10). Printing report and editing	64	0	1	0	Package	1.500	1.500	-	1.500	-	-
	11). Other miscellaneous	68	0,75	0,25	0	Package	500	500	375	125	-	-
Sub total Activity 1.2							22.650	16.450	6.200	-	-	-



Activity 1.3. To observe genetic diversity and vulnerability of the species	1). National Expert	11.2	0	6	0	Person-month	1.000	6.000	-	6.000	-	-
	2). Laboratorist	12.3	0	6	0	Person-month	350	2.100	-	2.100	-	-
	3). Other labors	12.4	0	80	0	Person-day	15	1.200	-	1.200	-	-
	4). Return Tickets	32.2	0	6	0	Trip	250	1.500	-	1.500	-	-
	5). Local Transport	33.2	0	8	0	Trip	200	1.600	-	1.600	-	-
	6). Daily Subsistence Allowance	31.2	0	60	0	Person-day	80	4.800	-	4.800	-	-
	7). Office Supplies	53	0	1	0	Package	500	500	-	500	-	-
	8). Materials	51	0	1	0	Package	1.500	1.500	-	1.500	-	-
	9). Other consumable items	54	0	1	0	Package	500	500	-	500	-	-
	10). Printing report and editing	64	0	1	0	Package	1.500	1.500	-	1.500	-	-
	11). Other miscellaneous	68	0	1	0	Package	1.000	1.000	-	1.000	-	-
<b>Sub total Activity 1.3</b>								<b>22.200</b>	-	<b>22.200</b>	-	-
Activity 1.4. To develop suitable method and strategy for conservation of each species based on Activity 1.2 and 1.3 (by CCR-Bogor)	1). National Experts	11.2	0	0	6	Person - month	3.000	18.000	-	-	18.000	-
	2). Assistant	12.1	0	0	6	Person - month	500	3.000	-	-	3.000	-
	3). Other labors	12.4	0	0	80	Person - day	15	1.200	-	-	1.200	-
	4). Return Tickets	32.2	0	0	12	trip	250	3.000	-	-	3.000	-
	5). Local Transport	33.2	0	0	12	trip	200	2.400	-	-	2.400	-
	3). Daily Subsistence Allowance	31.2	0	0	72	Person - day	80	5.760	-	-	5.760	-
	7). Capital item (land)	42	0	0	1	Package	6.000	6.000	-	-	6.000	6.000
	8). Office Supplies	53	0	0	1	Package	500	500	-	-	500	-
	9). Materials	51	0	0	1	package	1.000	1.000	-	-	1.000	-
	10). Fuel and Utilities	52	0	0	1	Package	200	200	-	-	200	-
	11). Other consumable items	54	0	0	1	Package	500	500	-	-	500	-
	12). Printing report and editing	64	0	0	1	Package	1.500	1.500	-	-	1.500	-
	13). Other miscellaneous	68	0	0	1	Package	1.000	1.000	-	-	1.000	-
<b>Sub total Activity 1.4</b>								<b>44.060</b>	-	-	<b>38.060</b>	<b>6.000</b>
Activity 1.5. To establish (revitalize) in-situ and ex-situ conservation of selected species	1). National Expert	11.2	0	12	0	Person - month	1.000	12.000	-	12.000	-	-
	2). Technician	12.2	0	12		Person - month	350	4.200	-	4.200	-	-
	3). Other labors	12.4	0	120	0	MD	15	1.800	-	1.800	-	-
	4). Local Transport	33.2	0	16	0	Trip	200	3.200	-	3.200	-	-
	3). Daily Subsistence Allowance	31.2	0	100	0	Days	80	8.000	-	8.000	-	-
	6). Capital (land)	42	0	4	0	Package	6.000	24.000	-	24.000	-	24.000
	7). Office Supplies	53	0	4	0	Package	500	2.000	-	2.000	-	-
	8). Materials	51	0	4	0	Package	1.500	6.000	-	6.000	-	-
	9). Fuel and Utilities	52	0	4	0	Package	300	1.200	-	1.200	-	-
	10). Other consumable items	54	0	4	0	Package	500	2.000	-	2.000	-	-

	11). Other miscellaneous	68	0	4	0	Package	500	2.000	-	2.000	-	-
<b>Sub total Activity 1.5</b>								<b>66.400</b>	-	<b>42.400</b>	-	<b>24.000</b>
<b>Sub total Output 1</b>								<b>164.710</b>	<b>25.850</b>	<b>70.800</b>	<b>38.060</b>	<b>30.000</b>
Output 2. The harvest of selected species is sustainably controlled												
Activity 2.1. To improve law enforcement through capacity building and awareness raising.	1). Workshop package (accomodation and organization)	63	0	0	1	Package	3.000	3.000	-	-	3.000	-
	2). Return Tickets	32.1	0	0	6	Participant	250	1.500	-	-	1.500	-
	3). Daily Subsistence Allowance	31.1	0	0	40	Participant	50	2.000	-	-	2.000	-
	4). Local Transport	33.1	0	0	40	Participant	35	1.400	-	-	1.400	-
	7). Printing report and editing	63	0	0	1	Package	1.500	1.500	-	-	1.500	-
<b>Sub total Activity 2.1</b>								<b>9.400</b>	-	-	<b>9.400</b>	-
Activity 2.2. To develop technical guideline and method for sound harvest of selected species (by CCR-Bogor)	1). National Expert	11.2	0	4	0	Person - month	3.000	12.000	-	12.000	-	-
	2). Assistant	12.1	0	4	0	Person - Month	500	2.000	-	2.000	-	-
	3). Other labors	12.4	0	40	0	Person - day	15	600	-	600	-	-
	4). Return Tickets	32.2	0	6	0	Trip	250	1.500	-	1.500	-	-
	5). Local Transport	33.2	0	6	0	Trip	200	1.200	-	1.200	-	-
	6). Daily Subsistence Allowance	31.2	0	42	0	Person - day	80	3.360	-	3.360	-	-
	7). Office Supplies	53	0	1	0	Package	500	500	-	500	-	-
	8). Materials	51	0	1	0	Package	500	500	-	500	-	-
	9). Fuel and Utilities	52	0	1	0	Package	200	200	-	200	-	-
	10). Other consumable items	54	0	1	0	Package	500	500	-	500	-	-
	11). Printing report and editing	63	0	1	0	Package	1.500	1.500	-	1.500	-	-
	12). Sundry	61	0	1	0	Package	1.000	1.000	-	1.000	-	-
	13). Other Miscellaneous	68	0	1	0	Package	500	500	-	500	-	-
<b>Sub total Activity 2.2.</b>								<b>25.360</b>	-	<b>25.360</b>	-	-
Activity 2.3. To carry out analyses for economic and utilization potential and chemical substance of selected species (Taxus, Gonystylus) (by CCR-Bogor)	1). National Expert	11.2	2	4	0	Person-month	1.000	6.000	2.000	4.000	-	-
	2). Technician	12.2	2	4	0	Person-month	350	2.100	700	1.400	-	-
	3). Daily Subsistence Allowance	31.2	15	28	0	Person - day	80	3.440	1.200	2.240	-	-
	4). Return ticket	32.2	2	4	0	Trip	250	1.500	500	1.000	-	-
	5). Local transport	33.2	2	4	0	Trip	200	1.200	400	800	-	-
	5). Office Supplies	53	1	1	0	Package	500	1.000	500	500	-	-
	6). Other consumable items	54	2	4	0	package	500	3.000	1.000	2.000	-	-
	7). Printing report and editing	63	0	1	0	Package	1.500	1.500	-	1.500	-	-
	7). Other miscellaneous	68	1	1	0	Package	1.000	2.000	1.000	1.000	-	-
<b>Sub total activity 2.3</b>								<b>21.740</b>	<b>7.300</b>	<b>14.440</b>	-	-
<b>Sub total Output 2</b>								<b>56.500</b>	<b>7.300</b>	<b>39.800</b>	<b>9.400</b>	-

<b>Output 3. Regeneration capacity of the selected species improved</b>												
Activity 3.1. To explore potential seed sources for selected species	1). National expert	11.2	0	4	0	Person-month	1.000	4.000	-	4.000	-	-
	2). Technician	12.2	0	4	0	Person-month	350	1.400	-	1.400	-	-
	3) Other Labors	12.4	0	120	0	Person-day	15	1.800	-	1.800	-	-
	4). Daily Subsistence Allowance	31.2	0	120	0	Person-day	80	9.600	-	9.600	-	-
	5). Local transport	33.2	0	20	0	Trip	200	4.000	-	4.000	-	-
	6). Office Supplies	53	0	2	0	Package	500	1.000	-	1.000	-	-
	7). Other consumable items	54	0	2	0	Package	500	1.000	-	1.000	-	-
	8). Material	51	0	2	0	Package	750	1.500	-	1.500	-	-
	9). Printing report and editing	63	0	1	0	Package	1.500	1.500	-	1.500	-	-
	10). Other Miscellaneous	68	0	3	0	Package	500	1.500	-	1.500	-	-
<b>Sub-total 3.1.</b>								<b>27.300</b>	-	<b>27.300</b>	-	-
Activity 3.2. To collect seeds, wildlings and other vegetative materials to be grown in nursery	1). National Experts	11.2	0	4	0	Person-month	1.000	4.000	-	4.000	-	-
	2). Technician	12.2	0	4	0	Person-month	350	1.400	-	1.400	-	-
	3). Other labors	12.4	0	120	0	Person - day	15	1.800	-	1.800	-	-
	4). Local Transport	33.2	0	20	0	Trip	200	4.000	-	4.000	-	-
	5). Daily Subsistence Allowance	31.2	0	120	0	Person day	80	9.600	-	9.600	-	-
	6). Capital items (Nursery)	43	0	4	0	Package	2500	10.000	-	5.000	-	5.000
	7). Office Supplies	53	0	2	0	Package	500	1.000	-	1.000	-	-
	8). Materials	51	0	2	0	Package	1500	3.000	-	3.000	-	-
	9). Fuel and Utilities	52	0	2	0	Package	300	600	-	600	-	-
	10). Other Consumable items	54	0	2	0	Package	500	1.000	-	1.000	-	-
	11). Other Miscellaneous	68	0	2	0	Package	500	1.000	-	1.000	-	-
<b>Sub-total 3.2.</b>								<b>37.400</b>	-	<b>37.400</b>	-	<b>5.000</b>
Activity 3.3. To improve stand management of selected in-situ conservation areas through enrichment planting and stand management.	1). National Experts	11.2	0	4	0	Person-month	1.000	4.000	-	4.000	-	-
	2). Technician	12.2	0	4	0	Person-month	350	1.400	-	1.400	-	-
	3). Other labors	12.4	0	120	0	Person - day	15	1.800	-	1.800	-	-
	4). Local Transport	33.2	0	20	0	Trip	200	4.000	-	4.000	-	-
	5). Daily Subsistence Allowance	31.2	0	120	0	Person day	80	9.600	-	9.600	-	-
	6). Office Supplies	53	0	2	0	Package	500	1.000	-	1.000	-	-
	7). Materials	51	0	2	0	Package	1000	2.000	-	2.000	-	-
	8). Fuel and Utilities	52	0	2	0	Package	300	600	-	600	-	-
	9). Other Consumable items	54	0	2	0	Package	500	1.000	-	1.000	-	-
	10). Other Miscellaneous	68	0	2	0	Package	500	1.000	-	1.000	-	-

<b>Sub-total 3.3.</b>								<b>26.400</b>	<b>-</b>	<b>26.400</b>	<b>-</b>	<b>-</b>
<b>Sub Total Output 3.</b>								<b>91.100</b>	<b>-</b>	<b>86.100</b>	<b>-</b>	<b>5.000</b>
<b>Non-activity Based Expenses</b>												
-	1).Project coordinator	11.1	12	12	12	Person - month	2.000	72.000	24.000	24.000	24.000	-
	2). Project Secretary	11.3	12	12	12	Person - Month	500	18.000	6.000	6.000	6.000	-
	3). Assistance	12.1	12	12	12	Person - Month	400	14.400	4.800	4.800	4.800	-
	4). Daily Subsistence allowance	31.2	16	16	16	Person - day	80	3.840	1.280	1.280	1.280	-
	5). Return Ticket	32.2	5	5	5	Trip	250	3.750	1.250	1.250	1.250	-
	6). Local Transport	33.2	5	5	5	Trip	200	3.000	1.000	1.000	1.000	-
	7). Office space	41	1	1	1	Year	5.000	15.000	-	-	-	15.000
	8). Operational Vehicles	44	1	1	1	Year	5.000	15.000	-	-	-	15.000
	9). Computer and pehiperals	45	1	0	0	Unit	2.500	2.500	2.500	-	-	-
	10). Fuels and utilities	52	2	2	2	Year	500	3.000	500	500	500	1.500
	11). Office supplies	53	2	2	2	Year	500	3.000	500	500	500	1.500
	12). Other consumable items	54	1	1	1	Year	500	1.500	500	500	500	-
	13). Sundry	61	1	1	1	Year	500	1.500	500	500	500	-
	14). Information, media, and various publication	65	1	1	1	Year	500	1.500	500	500	500	-
	15) Audit cost	62	1	1	1	Year	1.500	4.500	1.500	1.500	1.500	-
	16). Steering commitee meeting (transport and organization)	66	1	1	1	Event	750	2.250	750	750	750	-
	17). Consultative meeting (transport and organization)	67	2	2	2	Event	500	3.000	1.000	1.000	1.000	-
	18). Other miscellaneous	68	1	1	1	Year	500	1.500	500	500	500	-
<b>Sub total Non-activity Based Expenses</b>								<b>169.240</b>	<b>47.080</b>	<b>44.580</b>	<b>44.580</b>	<b>33.000</b>
<b>Total Budget</b>								<b>481.550</b>	<b>80.230</b>	<b>241.280</b>	<b>92.040</b>	<b>68.000</b>

### 3.4.2 Consolidated budget by component

Category	Description	Total	Year 1	Year 2	Year 3
<b>10</b>	<b>Personnel</b>				
11	National Experts				
	11.1 Project Coordinator	72.000	24.000	24.000	24.000
	11.2 Experts	72.000	5.000	49.000	18.000
	11.3 Project Secretary	18.000	6.000	6.000	6.000
12	Other Personnel				
	12.1 Assistants	19.400	4.800	6.800	7.800
	12.2 Technicians	11.900	1.400	10.500	-
	12.3 Laboratorist	2.100	-	2.100	-
	12.4 Other labors	11.550	1.350	9.000	1.200
<b>19</b>	<b>Component Total</b>	<b>206.950</b>	<b>42.550</b>	<b>107.400</b>	<b>57.000</b>
<b>20</b>	<b>Sub-contracts</b>				
21	Sub contract 1	-	-	-	-
22	Sub contract 2	-	-	-	-
<b>29</b>	<b>Component Total</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>30</b>	<b>Travel</b>				
31	Daily subsistence allowance				
	31.1 Workshop/training	4.000	2.000	-	2.000
	31.2 Others	64.400	8.880	48.480	7.040
32.	Domestic air ticket /return ticket				
	32.1 Workshop/training	3.000	1.500	-	1.500
	32.2 Others	11.250	1.750	5.250	4.250
33	Local Transport cost				
	33.1 Workshop/training	2.800	1.400	-	1.400
	33.2 Others	27.600	4.400	19.800	3.400
<b>39</b>	<b>Component Total</b>	<b>113.050</b>	<b>19.930</b>	<b>73.530</b>	<b>19.590</b>
<b>40</b>	<b>Capital Items</b>				
41	Office space	15.000	5.000	5.000	5.000
42	Land	30.000	-	24.000	6.000
43	Nursery	10.000	-	10.000	-
44	Vehicle	15.000	5.000	5.000	5.000
45	Capital Equipment				
	45.1 Computer Equipment (Notebook/PC/Printer)	2.500	2.500	-	-
<b>49</b>	<b>Component Total</b>	<b>72.500</b>	<b>12.500</b>	<b>44.000</b>	<b>16.000</b>
<b>50</b>	<b>Consumable Items</b>				
51	Raw Materials	16.000	500	14.500	1.000
52	Fuel and Utilities	6.300	1.375	3.725	1.200
53	Office Supplies	11.000	1.750	7.750	1.500
54	Other consumable items	12.000	2.000	9.000	1.000
<b>59</b>	<b>Component Total</b>	<b>45.300</b>	<b>5.625</b>	<b>34.975</b>	<b>4.700</b>
<b>60</b>	<b>Miscellaneous</b>				
61	Sundry	2.500	500	1.500	500
62	Audit Cost	4.500	1.500	1.500	1.500
63	Workshop package (accomodation and Organization)	6.000	3.000	-	3.000
64	Printing report and editing	12.000	1.500	7.500	3.000
65	Information, media and various publication	1.500	500	500	500
66	Steering committee meeting (transport and organization)	2.250	750	750	750
67	Consultative meeting (transport and organization)	3.000	1.000	1.000	1.000
68	Other miscellaneous	12.000	1.875	8.625	1.500
<b>69</b>	<b>Component total</b>	<b>43.750</b>	<b>10.625</b>	<b>21.375</b>	<b>11.750</b>
	<b>Sub total</b>	<b>481.550</b>	<b>91.230</b>	<b>281.280</b>	<b>109.040</b>

<b>70</b>	<b>National management costs</b>	<b>72.233</b>			
<b>80</b>	<b>Project Monitoring and administration</b>				
81	ITTO Monitoring and Review	8000			
82	ITTO ex-post evaluation	7000			
83	ITTO Program support cost (12% )	51.426			
89	Component Total	<b>66.426</b>			
	<b>Sub Total</b>	<b>620.209</b>			
<b>90</b>	Refund of pre-project costs	-			
	<b>Sub total</b>	-			
<b>100</b>	<b>GRAND TOTAL</b>	<b>620.209</b>			

### 3.4.3 ITTO Budget by component

Category	Description	Total	Year 1	Year 2	Year 3
<b>10</b>	<b>Personnel</b>				
11	National Experts				
	11.1 Project Coordinator	72.000	24.000	24.000	24.000
	11.2 Experts	72.000	5.000	49.000	18.000
	11.3 Project Secretary	18.000	6.000	6.000	6.000
12	Other Personnel				
	12.1 Assistants	19.400	4.800	6.800	7.800
	12.2 Technicians	11.900	1.400	10.500	-
	12.3 Laboratorist	2.100	-	2.100	-
	12.4 Other labors	11.550	1.350	9.000	1.200
<b>19</b>	<b>Component Total</b>	<b>206.950</b>	<b>42.550</b>	<b>107.400</b>	<b>57.000</b>
<b>20</b>	<b>Sub-contracts</b>				
21	Sub contract 1	-	-	-	-
22	Sub contract 2	-	-	-	-
<b>29</b>	<b>Component Total</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>30</b>	<b>Travel</b>				
31	Daily subsistence allowance				
	31.1 Workshop/training	4.000	2.000	-	2.000
	31.2 Others	64.400	8.880	48.480	7.040
32.	Domestic air ticket /return ticket				
	32.1 Workshop/training	3.000	1.500	-	1.500
	32.2 Others	11.250	1.750	5.250	4.250
33	Local Transport cost				
	33.1 Workshop/training	2.800	1.400	-	1.400
	33.2 Others	27.600	4.400	19.800	3.400
<b>39</b>	<b>Component Total</b>	<b>113.050</b>	<b>19.930</b>	<b>73.530</b>	<b>19.590</b>
<b>40</b>	<b>Capital Items</b>				
41	Office space	-	-	-	-
42	Land	-	-	-	-
43	Nursery	5.000	-	5.000	-
44	Vehicle	-	-	-	-
45	Capital Equipment				
	45.1 Computer Equipment (Notebook/PC/Printer)	2.500	2.500	-	-
<b>49</b>	<b>Component Total</b>	<b>7.500</b>	<b>2.500</b>	<b>5.000</b>	<b>-</b>
<b>50</b>	<b>Consumable Items</b>				
51	Raw Materials	16.000	500	14.500	1.000
52	Fuel and Utilities	4.800	875	3.225	700
53	Office Supplies	9.500	1.250	7.250	1.000
54	Other consumable items	12.000	2.000	9.000	1.000
<b>59</b>	<b>Component Total</b>	<b>42.300</b>	<b>4.625</b>	<b>33.975</b>	<b>3.700</b>
<b>60</b>	<b>Miscellaneous</b>				
61	Sundry	2.500	500	1.500	500
62	Audit Cost	4.500	1.500	1.500	1.500
63	Workshop package (accommodation and Organization)	6.000	3.000	-	3.000

64	Printing report and editing	12.000	1.500	7.500	3.000
65	Information, media and various publication	1.500	500	500	500
66	Steering committee meeting (transport and organization)	2.250	750	750	750
67	Consultative meeting (transport and organization)	3.000	1.000	1.000	1.000
68	Other miscellaneous	12.000	1.875	8.625	1.500
<b>69</b>	<b>Component total</b>	<b>43.750</b>	<b>10.625</b>	<b>21.375</b>	<b>11.750</b>
	<b>Sub total</b>	<b>413.550</b>	<b>80.230</b>	<b>241.280</b>	<b>92.040</b>
<b>70</b>	<b>National management costs</b>	0			
<b>80</b>	<b>Project Monitoring and administration</b>				
81	ITTO Monitoring and Review	8000			
82	ITTO ex-post evaluation	7000			
83	ITTO Program support cost (12% )	51.426			
89	Component Total	<b>66.426</b>			
	<b>Sub Total</b>	<b>479.976</b>			
<b>90</b>	Refund of pre-project costs	-			
	<b>Sub total</b>	-			
<b>100</b>	<b>GRAND TOTAL</b>	<b>479.976</b>			

#### 3.4.4 Executing agency budget by component

Category	Description	Total	Year 1	Year 2	Year 3
<b>40</b>	<b>Capital Items</b>				
41	Office space	15.000	5.000	5.000	5.000
42	Land	30.000	-	24.000	6.000
43	Nursery	5.000	-	5.000	-
44	Vehicle	15.000	5.000	5.000	5.000
<b>49</b>	<b>Component Total</b>	<b>65.000</b>	<b>10.000</b>	<b>39.000</b>	<b>16.000</b>
<b>50</b>	<b>Consumable Items</b>				
52	Fuel and Utilities	1.500	500	500	500
53	Office Supplies	1.500	500	500	500
<b>59</b>	<b>Component Total</b>	<b>3.000</b>	<b>1.000</b>	<b>1.000</b>	<b>1.000</b>
	<b>Sub total</b>	<b>68.000</b>	<b>11.000</b>	<b>40.000</b>	<b>17.000</b>
<b>70</b>	<b>National management costs</b>	<b>72.233</b>			
<b>80</b>	<b>Project Monitoring and administration</b>				
81	ITTO Monitoring and Review	0			
82	ITTO ex-post evaluation	0			
83	ITTO Program support cost (12% )	-			
89	Component Total	-			
	<b>Sub Total</b>	<b>140.233</b>			
<b>90</b>	Refund of pre-project costs	-			
	<b>Sub total</b>	-			
<b>100</b>	<b>GRAND TOTAL</b>	<b>140.233</b>			



### 3.5 Assumption, risks, and sustainability

#### 3.5.1 Assumption and risks

The purpose of this project is to enhance the conservation of high value indigenous species of Sumatra. These species are important and becoming a great interest for local community, local government and Ministry of Forestry. Since the project objectives is the interest of all stakeholders, it is likely that this project could be implemented smoothly and will receive support from all stakeholders. However, several activities could only be carried out if the necessary condition available, such as high accessibility to the target areas, the availability of planting materials (seeds and wildlings) and consistent support to establish *ex-situ* and *in-situ* conservation areas and seed sources. **The availability of planting materials could affect the implementation of some activities. The climate change, habitat disturbance and stand structure affect seasonal change on reproductive phenology of some species. This may cause poor seed production. However, these could be mitigated by collecting vegetative cuttings (clones) and expanding the collection sites (areas). For some species, the collection of genetic materials could be expanded from other nearby islands.**

To anticipate the above potential risk, several necessary mitigation approaches will be taken:

- Establish close consultation with relevant institutions, especially DG PHKA and provincial forest services, prior to the implementation of project activities including appointing committed personnel.
- Explore as many as possible accessible areas as potential areas for conservation sites, stands, and seed sources.
- Early detection and determination of those areas for seed sources.
- Search as many as possible the potential seeds and planting materials for collection for enrichment planting and stand improvement.
- Early and wide dissemination of project mission and objective to wider stakeholders and communities in order to receive support.
- **Collect vegetative materials (clones) and expand the collection sites from nearby islands**

#### 3.5.2 Sustainability

Regional Forestry Research Institutes of North Sumatra, Riau, and South Sumatra are the implementing agencies and the proponents of this proposed project under the supervision of FORDA. These institutions will have a great interest to keep on project initiated activities, to safeguard the use of the guidelines and methods and to widely disseminate the updated data and information to the primary users.

- FORDA and DG PHKA will ensure the provision of resources (financial support and human resource) for the continuation and maintenance of project initiated activities (*in-situ* and *ex-situ* conservation sites).
- Forest Research Institutes will maintain and continue to grow planting materials for enrichment planting and replenishment of the project initiated conservation sites.
- Regional office of DG PHKA will also involve in maintaining project initiated activities, as part of its mandate to achieve the objective of biodiversity conservation.
- Provincial and District Forest Service will also take part in the maintenance as part of their obligation to protect natural resources.
- Project determine the committed and interest personnel on the issue of species conservation.
- Project ensures the involvement of committed and interest personnel since early stage of the project implementation.
- Project determine the most accessible and secure sites for plot establishment to keep cost effective after project completion.
- Project provides and disseminate clear and attractive description of each species for conservation, utilization and economic potential and other project results and findings.

## PART 4. IMPLEMENTATION ARRANGEMENT

### 4.1 Organization structure and stakeholder involvement mechanism

#### 4.1.1 Executing agency and partners

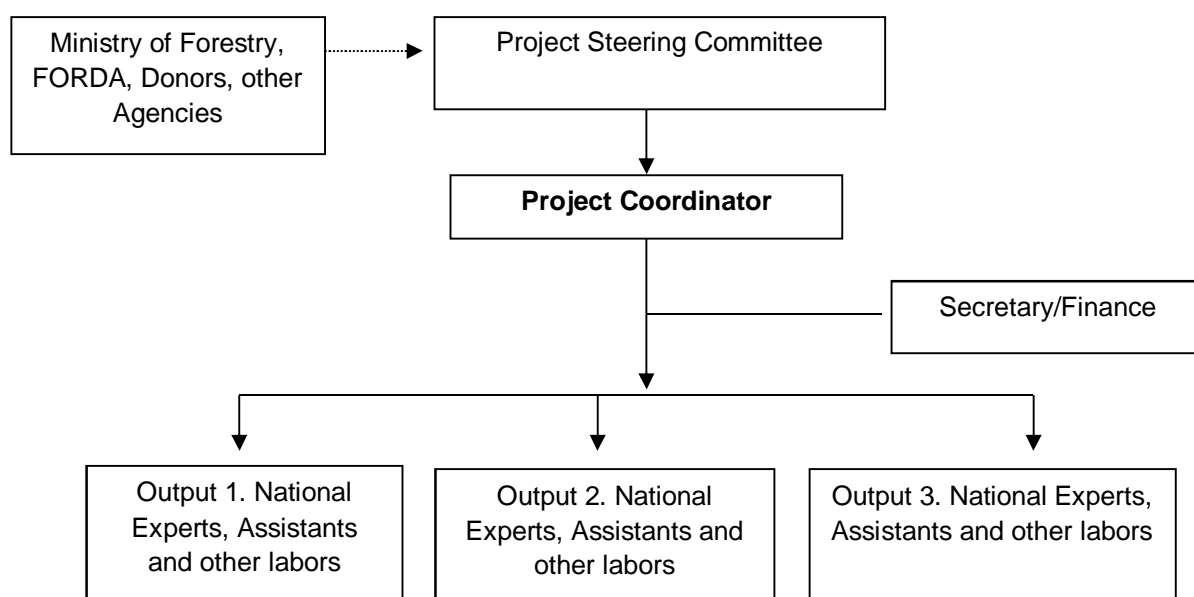
The proposed project will be executed by regional Forestry Research Institutes (FRI) of Kuok, Riau Province (under FORDA) in collaboration with FRI of North Sumatra, FRI of South Sumatra. Center for Rehabilitation and Conservation Research and Development (CFNCRD) and Center for Biotechnology and Tree Improvement Research (CBTIR) take part in some activities. This project will be supervised by FORDA. The key responsibility of FORDA is to appoint key personnel, the provision of office space and allocation of *in-kind* contribution to the project.

Other collaborating institutions include Indonesian Institute of Science (LIPI), Regional Office of Forest Protection and Nature Conservation, Provincial and District Forest Services. The Regional Forestry Research Institutes possess main duties to conduct research and development on forestry related issues and to provide scientific basis for the formulation of policy in forestry. These institutions have long experience and expertise in the execution of national and international projects and have been facilitated with experienced and qualified personnel, modern and complete biotechnology laboratories and research stations.

#### 4.1.2 Project management team

Day to day management will be carried out by a Project Management Team which consists of a Project Coordinator, Project Secretary (finance) and assistants and other qualified personnel required by the project. The Project Coordinator will be officially assigned by FORDA secretariat and the name is listed in the Appendix. Project Secretary (and finance), assistants (if any) and National Expert will be officially contracted by Project Coordinator from the involved personnel (project key personnel) as listed in ANNEX with the approval from ITTO. The National Experts appear in ANNEX 2 may be replaced with other staffs. Detail profiles of Executing Agency (FORDA) and CV's of Key Personnel are presented in ANNEX 1 and 2.

**Figure 4. Organization structure of project**



#### **4.1.3 Project steering committee**

The PSC will be officially formed by FORDA. The role of PSC is to guide, evaluate and to provide direction of the project implementation. The PSC also conducts reviews of the project budget and associated expenses, endorses the YPO and changes needed. The PSC will consist of a chair, members and observer from the Executing Agency, Forestry Research and Development Agency (FORDA), Directorate of Biodiversity Conservation, Center for International Cooperation (KLN) and Provincial Forest Services and other relevant institutions and representative of donor countries.

#### **4.1.4 Stakeholder involvement mechanism**

Prior to the operational activities of the project, a preparatory meeting will be organized. All relevant stakeholders and potential partners will be invited. Consultative and technical meetings will be regularly organized in order to ensure the smooth implementation of activities and involvement of necessary partners. The recommendation and views raised from the meetings will be accommodated to improve the project performance and the achievement of project objectives. A necessary additional mechanism for the involvement will also be formed during the consultation and preparatory meeting of the project.

### **4.2 Monitoring, review and evaluation**

Several reports will be prepared in accordance with the ITTO reporting requirement as follows:

- **Inception report**

To be submitted after signing the agreement, confirmation of availability of office space, registered banking account, necessary changes if any, the first YPO and other necessary documents.

- **Yearly of operation**

To be submitted a year prior to the commencing with the operation for endorsement by PSC as appropriate, and by ITTO. The first YPO will be submitted together with the inception report. The YPO contains budget plan in accordance with work plan and necessary changes.

- **Project progress reports**

To be submitted bi-annually or upon requested by ITTO. This report contains information on the executed activities during the period covered by the report, the achieved outputs as appropriate, and inputs applied during that period.

- **Technical reports**

To be submitted in accordance with the schedule and at two months after project completion. The technical report contains technical and scientific data, analyses of data and the project results. A technical report may be derived from a single activity or a set of relevant activities, including proceedings.

- **Financial report**

To be submitted within three months after the end of the current financial report. Financial report will be prepared by a registered independent public accountant. Before auditing, the project will nominate and request for approval and endorsement from ITTO.

- **Completion report**

To be submitted within three months after project completion. This report contains summary of activities, inputs and expenditures, achieved outputs and objectives during the entire implementation phase. The report also highlights the most critical differences between planned and realized project elements based on the previously approved project document as primary references. This report also contains lessons learned from the implementation of the projects.

## **Monitoring and review**

Review, monitoring and evaluation of the project will also be conducted using ITTO procedures. PSC meeting could be used to review and evaluate the project implementation. Independent monitoring could also be executed by ITTO and other stakeholders.

## **4.3 Dissemination and mainstreaming of project learning**

### **4.3.1 Dissemination of project results**

Project learning will be disseminated using various media and channels, during the implementation phase and after project completion.

- **Brochures and technical documents.** Contains overall project objectives, activities, and the importance of each species description with easy reading materials will be disseminated through various events and moments.
- **Technical reports.** The technical report which contains scientific data, information and any other important information will be disseminated to relevant institutions, such as research institutions, universities, NGOs, and Directorate of Biodiversity Conservation.
- **National workshops and internal meetings.** Events in national workshop and internal meeting will be used to disseminate various project findings and results as in addition to other methods of dissemination.
- **Completion report.** This complete information of project implementation, results and findings will be submitted to ITTO for wider uses and dissemination, including to donor countries.

### **4.3.2 Mainstreaming of project results**

The primary users of the findings and results of this project are local community, local government, DG Forest Protection and Nature Conservation, and scientific communities. Information on economic potential and other uses will be used by concerned institutions (especially local government) to improve efficiency and economic benefits to community. The updated biological and ecological data and information resulted from this project, the current status of the existing *in-situ* and *ex-situ* conservation will be summarized and further synthesized. The summary and the synthesis will be forwarded to DG PHKA which could be used for review on management plan and policy on the conservation of biological diversity in Indonesia. This review could be used in CBD and IUCN. Through wide application and uses of the project findings and results, the expected impacts of this project will also be realized in conservation program in Indonesia.

## **ANNEX 1. Profile of the Executing Agency**

Regional Forestry Research Institute of Kuok (Riau), formally named Research Institute of Fiber Technology of Forest Plants, is research institution under FORDA, located near Pekanbaru, Riau Province, Sumatra. FORDA is subsidiary body of the Ministry of Forestry and holder of scientific authority on forestry, and therefore responsible for the available scientific information and technologies for decision making as well as for practical uses. This body was first established in late 1950s and re-established in 1983 under name of FORDA.

Some of FORDA missions are to conduct research and development on all aspects related to the conservation of forest and nature including the conservation of plant genetic resources, *in-situ* and *ex-situ*. This mission is directed to contribute to the achievement of SFM through the provision of scientific information. FORDA is supported with laboratory facilities, nurseries, and research sites distributed in a wide range of ecological distribution in Sumatra, Kalimantan, and other major islands. FORDA employs a number of staffs and research scientists with PhDs, master degree, and bachelors with high level of expertise and experiences in related fields. In operational activities, FORDA establishes research collaboration with Regional Forestry Research Institutes and other relevant local organizations.

FORDA receives annual budget up to US\$ 1 600 000. FORDA has long experiences in managing collaborative works with local and international institutions, such as JICA, DFID, European Union, ACIAR, and ITTO projects.

## ANNEX 2. Task and Responsibilities of key personnel

No.	Name/Designation	Education/Experties	Roles in project Implementation
1.	Eka Novrianti/ Researcher of RRC Kuok, Riau	PhD-Hokkaido University, Japan/ Forest Ecology and Silviculture	Project Formulator, Coordinator for operational activities of the project, National Expert/Researcher for Activities 1.1; 1.2; 1.5; 2.1
2.	Rospita O.P. Situmorang/Researcher of RRC North Sumatra	Master-Gadjahmada University, Indonesia/ Urban Planning	National Expert/Researcher for the implementation and execution of Activities 1.1; 1.2; 1.5; 2.1 in collaboration with other RRCs
3.	Hengki Siahaan/ Researcher of RRC South Sumatra, Palembang	Master-Bogor Agricultural Institute, Indonesia/ Forest Ecology and Silviculture	National Expert/Researcher for the implementation and execution of Activities 1.1; 1.2; 1.5; 2.1 in collaboration with other RRCs
4.	M. Hadi Saputra/Researcher of RRC North Sumatra	Bachelor, Gadjahmada University, Indonesia/Forest silviculture	National Expert/Researcher for the implementation and execution of Activities 1.1; 1.2; 1.5; 2.1 in collaboration with other RRCs
5.	Anton YPB Widiyatmoko/Center for BTI-Yogya	PhD - Kyusu University,Japan/ Biotechnology and Forest Genetics	National Expert/Researcher for implementation and execution of Activity 1.3 (genetic variation of each species)
6.	Adi Susilo/Center for Conservation and Rehabilitation-Bogor	Master - Michigan State University,USA/Biodiversity and forest ecology	National Expert/Researcher for implementation and execution of Activity 2.3 (Economic analyses and chemical substance of agarwood and taxol)
8.	Tajudin Edy Komar/Center for Conservation and Rehabilitation	Master- University of Victoria, BC,Canada/Forest Biology, Biodiversity and Silviculture	Supervisor in Project Formulation/National Expert for the execution of Activity 1.4 (Developing strategy and action plan for conservation of each individual species and Activity 2.2 (Developing technical guideline and method for sustainable harvest of selected species)

### KEY PERSONNEL 1:

Name : Dr. Eka Novriyanti, S.Hut, M.Si  
Sex : Female  
Place/Date of birth : Bukittinggi/ November7 1976  
Nationality : Indonesia  
Current job : Researcher  
Affiliation : Fiber Technology of Forest Plants Research Institute (Regional Forestry Research Institute of FORDA)  
Office address : Jl. Raya Bangkinang-Kuok Km. 9 Bangkinang. Kotak Pos 4/BKN Bangkinang, Kampar, Riau, 28401  
Educational Background : - Forest Product Technology Division, Faculty of Forestry, Bogor Agriculture Institute, Bogor, Indonesia (Bachelor), 1995-2000  
- Forestry Science, Graduate School of Bogor Agriculture Institute (Master of Science), 2006-2008  
- Forest Ecology and Silviculture, Division of Environmental Resources, Graduate School of Agriculture, Hokkaido University, Japan  
Job experience : Researcher at FRI Kuok (FORDA), 2002-now  
List of recent publication :

1. Novriyanti, E., Watanabe, M., Kitao, M., Utsugi, H., Uemura, A., Koike, T. 2012. High nitrogen and elevated [CO<sub>2</sub>] effects on the growth, defense and photosynthetic performance of two eucalypt species. **Environmental Pollution** 170: 124-130.
2. Novriyanti, E., Watanabe, M., Makoto, K., Takeda, T., Hashidoko, Y., Koike, T. 2012. Photosynthetic nitrogen and water use efficiency of acacia and eucalypt seedlings as afforestation species. **Photosynthetica** 50: 273-281.
3. Novriyanti, E., Aoyama, C., Watanabe, M., Koike, T. 2010. Plant defense characteristics and hypothesis on the birch species. **Eurasian Journal of Forestry Research** 13: 77-85.
4. Aoyama, C., Novriyanti, E., Koike, T. 2010. Induced defense in the leaves of Japanese white birch seedlings grazed by Gypsy moth larvae. **Eurasian Journal of Forestry Research** 13: 49-55.
5. Novriyanti, E., Santosa, E. 2011. The role of phenolics in agarwood formation of *Aquilaria crassna* Pierre ex Lecomte and *Aquilaria microcarpa* Baill trees. **Journal of Forestry Research** 8 (2): 101-113.
6. Novriyanti, E., Santosa, E., Syafii, W., Turjaman, M., Sitepu, I.R. 2010. Anti-fungal activity of wood extract of *Aquilaria crassna* Pierre ex Lecomte to *Fusarium bulbigenum*. **Journal of Forestry Research** 7 (2).

### KEY PERSONNEL 2:

Name : Rospita O.P. Situmorang, STP., M.Eng.  
Sex : Female  
Place/Date of birth : Bahsampuran/ Januari 26 1980  
Nationality : Indonesia  
Current job : Researcher  
Affiliation : Forestry Research Institute of North Sumatra (Regional Forestry Research Institute of FORDA)  
Office address : Forestry Research Institute Campus, Aek Nauli, North Sumatra  
Educational Background : - Faculty of agriculture, University of North Sumatra, Medan, Indonesia (Bachelor), 1998-2003  
- Urban Planning Major, Gadjahmada University, Jogjakarta, Indonesia (Master of Engineering), 2009-2012  
Job experience : - Staff at Karo District of Agriculture Office, North Sumatra  
- Researcher at FRI North Sumatra (FORDA), 2012-now

**KEY PERSONNEL 3:**

Name : Hengki Siahaan, S.Hut., M.Si  
Sex : Male  
Place/Date of birth : Toba Samosir/ August 22 1973  
Nationality : Indonesia  
Current job : Researcher  
Affiliation : Forestry Research Institute of Palembang, South Sumatra (Regional Forestry Research Institute of FORDA)  
Office address : Jl. Kol. H. Burlian Km. 6.5 Punti Kayu, Palembang, South Sumatra 30150  
Educational Background : - Forestry Major, Faculty of Agriculture, University of Bengkulu, Indonesia (Bachelor), 1995-2000  
- Forestry Science, Graduate School of Bogor Agriculture Institute (Master of Science), 2006-2008  
Job experience : Researcher at FRI of South Sumatra (FORDA)

**KEY PERSONNEL 4:**

Name : M. Hadi Saputra, S.Hut.  
Sex : Male  
Place/Date of birth : Padang/ October 20 1987  
Nationality : Indonesia  
Current job : Researcher  
Affiliation : Forestry Research Institute of North Sumatra (Regional Forestry Research Institute of FORDA)  
Office address : Forestry Research Institute Campus, Aek Nauli, North Sumatra  
Educational Background : Silviculture Major, Faculty of Agriculture, Gadjahmada University, Jogjakarta, Indonesia (Bachelor), 1995-2000



### ANNEX 3. TERM OF REFERENCES OF PERSONNEL AND CONSULTANTS FUNDED BY ITTO

#### 1. Term of references for Project Coordinator

Project Coordinator (PC) will run the project and coordinate the operational activities.

**Responsibilities:** PC will be responsible for the day to day management of the project. PC will be responsible for coordinating and supervising all activities and ensuring that the overall objectives are achieved. PC will work closely with all parties and personnel involved in the project, integrating all activities of the project, managing and responsible for the fund applied to the project and for the preparation of all reports.

**Qualification, duration of contract and payment:**

- Postgraduate degree in forestry science (expertise in forest ecology, conservation, or silviculture is preferable)
- Possess good English, both oral and written
- Has Good understanding and broad knowledge on biodiversity and conservation, and current situation of the selected species.
- PC will be hired for duration of contract of 36 months
- The rate of payment is US\$ 2000 per month

#### 2. Term of references for Project secretary/finance

Secretary will be hired to assist the PC, particularly in administrative issues and dissemination of project results.

**Responsibilities:** Secretary will be responsible in handling administrative issue, financial issue, reporting, publication, and dissemination of project results. He or she will work closely to all parties and personnel involved in the project, particularly with PC and experts. Secretary will report to PC.

**Qualification, duration of contract and payment:**

- Graduate degree from any discipline with minimum 5 years of working experience is preferable
- Possess good English, both oral and written
- Familiar and have good knowledge on IT is preferable
- Having good understanding and broad knowledge of conservation, environment, and rural community issues is preferable
- Having experience in organizing training/workshop and dissemination practices is preferable
- Outgoing, friendly and willing to work full time for the project is preferable
- Duration of contract is 36 months with annual evaluation of his/her working performance. The extension of contract will be determined based on this annual evaluation.
- The rate of payment is US\$ 500 per month

#### 3. Term of references for National Expert (s)/Consultant (s)

National expert/consultant will be assigned in activities 1.3, 1.4, 1.5, 2.1, 2.2. The expert (s) must hold expertise and knowledge in related field.

**Responsibilities:** the expert will responsible to search and collect all required data and information to develop diagnostic reports which will help the project to properly design the best approaches in achieving all outputs and outcomes in related activities. Expert will prepare one or

more technical report related with the assigned activity. These reports and other database must be presented in the meetings held by the projects.

**Qualification, duration of contract and payment:**

- Postgraduate degree and has expertise in related field (conservation, ecology, silviculture, tree physiology, biotechnology/tree improvement, etc.)
- Possess good English, oral and written.
- Broad knowledge on current situation of the selected species.
- The project expert (s) or Consultant (s) will be hired for duration of contract for each activity.
- The rate of payment is US\$ 1500 per month.

**ANNEX 4. RECOMMENDATION OF THE 46<sup>TH</sup> EXPERT PANEL AND THE RESPECTIVE MODIFICATION**

No	Recommendation	Modification	Page
1	Improve map of Sumatra island by identifying the target areas and further elaborate the geographical location of the target area	The map of Sumatra Island has been improved and target sites have been marked. Further information on geographical location of the areas has been further elaborated (point 1.3.1).	P vi  P 5
2	Elaborate the social, cultural, economic and environmental aspects of the project sites	The social, cultural, economic and environmental aspects of the project sites have been elaborated	P 6
3	Improve the institutional set up and organizational issues by specifying appropriate partners for project implementation and the roles of respective partners	The coordinator and specific role or duty of each partners was described and elaborated in the section of institutional set up for project implementation.	P 8
4	Redefine the statements of the development and specific objective by more clearly specifying their intended contribution	The development and specific adjectives have been rephrased to clearly show intended contribution in the Logical Framework matrix and in points 2.2.1 and 2.2.2	P 13,14
5	Provide more information on the proposed establishment of in-situ and ex-situ conservation of the selected species	Information on the establishment of <i>in-situ</i> and <i>ex-situ</i> conservation was elaborated in the Activity 1.5	P 15
6	Improve the risk assessment by identifying specific risks beyond the control of the project management	The specific risk may occur is the unavailability of planting materials (seeds, wildlings, or others). This will be mitigated by collecting vegetative cuttings (materials) as written in Project Brief and point 3.5.1 Assumption and risk	P 2, 27
7	Include an annex that shows the recommendation of the 46 <sup>th</sup> expert panel and the respective modification in tabular form. Modification should also be highlighted (bold and underline) in the text	This table addresses the revisal of this proposal based on recommendation of the 46 <sup>th</sup> expert panel. The modification in the text is bolded and underlined.	P 36