

# ITTO CITES PHASE — II

“Ensuring Genetic Diversity of Ramin Seed Sources and Ramin  
Population from Rooted Cuttings”

## Completion Report



Ministry of Environment and Forestry  
Agency for Research, Development and Innovation  
Center for Biotechnology and Tree Improvement Research and Development  
in cooperation with  
International Tropical Timber Organization  
(ITTO) - CITES Phase II Project

Indonesia  
March - 2016





# Completion Report

ITTO-CITES Phase II  
2015

## “Ensuring Genetic Diversity of Ramin Seed Sources and Ramin Population from Rooted Cuttings”

*Charomaini, M., Widyatmoko, AYPBC., Pamungkas, T., Tajudin, E.K., Yelnititis, Wardhani, M., Haryjanto, L., Prastyono, Prastiwi, L., Jamil, A.P.A.*

In Cooperation  
Ministry of Environment and Forestry, Indonesia  
Forestry Research Development and Innovation Agency, Jakarta  
Center for Forest Biotechnology and Tree Improvement Research and Development,  
Yogyakarta  
Forest Research and Development Center, Bogor.  
And  
INTERNATIONAL TROPICAL TIMBER ORGANIZATION – CITES



Yogyakarta, 2016

## COMPLETION REPORT

Title	<i>"Ensuring Genetic Diversity of Ramin Seed Sources and Ramin Population from Rooted Cuttings"</i> .		
Executing Agency	Ministry of Environmental and Forestry of Indonesia (MoEF).		
Implementing Agency	Center for Forest Biotechnology and Tree Improvement Research and Development (CFBTIR) Yogyakarta.		
Collaborating Agency	Forest Research and Development Center (FRDC) Bogor.		
Host Government	Government of Indonesia		
Starting Date	1 January 2015		
Actual Duration	15 months (with 3 months extension)		
Actual Activity Costs (US\$)	ITTO	=	US\$ 141,450.00
	Gol (in-kind)	=	US\$ 25,145.00
	TOTAL	=	US\$ 166,595.00
Team Members:	M. Charomaini -Team Leader ITTO-CITES (Phase II-CFBTIR) Dr. Antonius Y.P.B.C. Widyatmoko – NE. Tri Pamungkas, MSc. – RA. Tajudin Edy Komar, MSc. - NE Yelnititis, MSi. - RA Marfuah Wardhani, MSc. - NE Lucita Prastiwi. - Secretary Alifianingrum Putri Ardi Jamil - Administrative Assistant		

Center for Forest Biotechnology and Tree Improvement Research and Development.  
Jl. Palagan Tentara Pelajar km 15. Purwobinangun, Pakem, Sleman, Yogyakarta. 55582.  
Indonesia. Phone: +62-274 895954; Fax: +62-274 896080; Web: [www.biotifor.or.id](http://www.biotifor.or.id). E-mail: [breeding@biotifor.or.id](mailto:breeding@biotifor.or.id).

---

This work was made possible by a grant from ITTO under its collaborative program with CITES "Support to ITTO CITES Implementation for Tree Species and Trade/Market Transparency (TMT). Donors to this collaborative program include the EU(primary donor), the USA, Germany, the Netherlands and Norway.The Activity was implemented by Center for Forest Biotechnology and Tree Improvement Research and Development with Center for Forest Research and Development as Collaborating Agency.

---



## TABLE OF CONTENTS

No	Title	Page
	<b>Executive Summary</b>	5
<b>1.0</b>	<b>Activity Identification</b>	9
1.1	Context	9
1.2	Origin and Problem to be addressed	11
<b>2.0</b>	<b>Activity Objectives and Implementation Strategy</b>	12
2.1	Objectives	12
2.2	Implementation Strategy	12
2.3	Assumptions and Risks	13
<b>3.0</b>	<b>Activity Performance (Activity elements planned and implemented)</b>	14
3.1	Performance of each Activity	14
3.2	Outputs achievement	15
3.3	Total Amount of Expenditures and Analysis	16
<b>4.0</b>	<b>Activity Outcome Target Beneficiaries Involvement</b>	17
4.1	Achievement of specific objectives	17
4.2	Outputs	17
4.3	Impact/ Outcome	17
4.4	Participation of targeted beneficiaries	18
4.5	Intended Situation after Activity completion	18
4.6	Expectations of Activity sustainability	19
<b>5.0</b>	<b>Assessment and Analysis</b>	20
<b>6.0</b>	<b>Lessons Learnt</b>	21
6.1	Project Identification and design matters	21
6.2	Operational matters	21
<b>7.0</b>	<b>Conclusions and Recommendations</b>	21
<b>8.0</b>	<b>References</b>	22
	<b>Annex 1A:</b> Activity Financial Statement (ITTO)	24
	<b>Annex 1B:</b> Activity Cash Flow Statement (ITTO)	25
	<b>Annex 2A:</b> Activity Financial Statement (Gol)	26
	<b>Annex 2B:</b> Activity Cash Flow Statement (Gol)	27



## **EXECUTIVE SUMMARY**

### **1. Activity Context, Origin and Problem to be Addressed**

Ramin (*Gonystylus bancanus* (Miq) Kurz.) is one of the most important species growing in tropical peat swamp forest in Indonesia. Due to over exploitation, its population decreased sharply in the last several years. To prevent further degradation of its population and habitats, ramin exploitation has been banned since 2001. The permit to harvest ramin is granted to one forest concession only who hold certificate of sustainable forest management from Indonesia Ecolabeling Institute. Ramin populations in Sumatera and Kalimantan have been depleted, scattered and decreased in size due to illegal logging, forest conversion, and forest fires that have also threatened the populations. This caused seed sources of ramin in Indonesia to remain limited in distribution, quality and number. Only few mother trees are recorded in the natural habitats and in general they have poor accessibility. Reduced seed sources have caused scarcity of procurement from seeds and currently they are being replaced by vegetatively propagated planting materials. However, vegetative propagated seedlings (rooted cuttings) by recurrent production from similar mother plants would decrease and narrow the genetic variation. Therefore, in order to ensure effective conservation, early detection of variability using DNA analysis is necessary. This easy detection is important to anticipate future problems related to the conservation and plantation programs of ramin in Indonesia.

### **2. Activity Objectives**

Overall objective of the activity is to contribute to the conservation and plantation of Ramin using wildlings and rooted cutting materials in Sumatera and Kalimantan through genetic analysis and infusion of genetic materials to ramin cuttings.

The specific objectives are to detect genetic variation of ramin in the conservation gardens at OKI, South Sumatera and Tumbangnusa, Central Kalimantan and to infuse the ramin cuttings in the conservation gardens at OKI and Tumbangnusa, and to explore and establish an *ex situ* conservation plot of non-*Gonystylus bancanus* in Sumatera and Kalimantan.

### **3. Most Critical Differences between Planned and Realized Activity Implementation**

#### **Activity personnel**

Personnel who is involved in the activity are slightly different from that mentioned in the original document with similar in qualification. Therefore, the quality of the activity remains similar.

#### **Time Schedule**

Originally planned schedule of the Activity was from 1 January 2015 to 31 December 2015. Extended three months no additional budgeting was granted to the Activity from 1 January 2016 to 31 March 2016. This was to enable utilizing several incomplete activities such as to enhance the cooperation between the National Expert teams and the related stakeholders on the additional exploration of non-*G.bancanus* in West Kalimantan and the establishment of an *ex situ* conservation plot in Sumberwringin, Bondowoso, East Java, rather than

Sumatera or Kalimantan; and to conduct Workshop/ Expose activity results implemented by ITTO-CITES (Phase II-CFBTIR) in Jakarta.

### ***Budget Amendment***

The fund was adequate enough to run the activities and has been spent as scheduled of 15 months. The two installments have been requested and utilized. The unspent budget was sent back to ITTO via bank BNI Indonesia on 1 April 2016.

### ***4. Situation prevailing after Activity Completion, as Compared to the Pre-activity Situation including the Situation of the Target Beneficiaries, and the post-Activity Sustainability***

The results of DNA analysis on the genetic and morphological diversities of Ramin in OKI, South Sumatera found that there were 2 groups that could be considered as variety. Genetic diversity of ramin from rooted cuttings proved to be wide, no worry about the narrow of the genetic diversity. To utilize the cuttings for plantation, the number of trees for cuttings should be numerous with high genetic diversity. OKI conservation garden could be used as hedged orchard or source of genetic materials. By the results of the DNA analysis, the most important thing was that the genetic diversity of ramin from stem cuttings is still wide. Plantation using rooted cuttings of ramin, will be no problem as long as the number of cuttings sources is many.

Ramin plantation in OKI could benefit local Forest District, Forest companies and the Ministry of Environment and Forestry and could be utilized as a show window, could prove that planting ramin in a peat swamp forest will not be a problem.

DNA analysis on Ramin at OKI, South Sumatera and Tumbangnusa, Central Kalimantan provided an important information that 1) Hedged orchard of ramin either in OKI or Tumbangnusa have high genetic diversity; 2) If possible, there is need to add more individuals of each population and added with more population of ramin distributions from Sumatera and Kalimantan; 3) Planting rooted cuttings originated from the orchards, should be separated between Sumatera and Kalimantan. The management authority as well as researchers is recommended not to mix the ramin population of Sumatera into the population of ramin from Kalimantan, in order to maintain the original genetic make up, especially when the purpose is to establish a conservation garden.

*Ex situ* conservation garden could be established by either using rooted cuttings or tissue culture, eventhough tissue culture of ramin is proved to be quite difficult and takes a long time to produce readily planted plantlets. *In situ* conservation activity is rather unrealistic due to the no available sites for the purpose as the mostly sites have been occupied by people to be utilized as Plantation State or inhabitant.

Exploration activities on non-*G.bancanus* to West Sumatera, South Sumatera, Bengkulu, Central Bangka, West Kalimantan, and Central Kalimantan proved that mostly ramin habitats have been utilized by people to plant coffee, for shelters or inhabitant and as Oil palm plantation, mining. The most destructive activity is that people prepares/ clears the land by burning the forest floor, causing the extinction of the orthodox seeds and wildlings as well. The local government, Forest District authorithies could be aware of those conditions and take action especially when the situation was happened on the State Forest such as



National Park etc. (example is Taman Nasional Kerinci Seblat/ National Park of Kerinci Seblat in Bengkulu Province).

*Ex situ* conservation plot for a non-*G. bancanus* (*G. velutinus* collected from Bengkulu/ Taman Nasional Kerinci Seblat) has been established, about 200 wildlings have been planted in Sumberwringin, Bondowoso, East Java, of about 0.35 ha in acreage. *G. brunnescens* collected from West Kalimantan will be planted in the same place as well, for the time being, the cuttings is being grown under COFFCO plastic chambers, placed in a water fogged greenhouse in Yogyakarta. One initial step to conserve *Gonystylus* other than ramin (*G. velutinus* and *G. brunnescens*) has been implemented and will be expected to develop in Java in the future.

### **5. Most Relevant Outcome of the Analysis of the Activity Implementation**

- i) Two groups of ramin should be called variety based on the distinct morphological characteristics such as: size and color of the leaves; branching habit, heavy and light; stem form, monopodial and sympodial.
- ii) The use of rooted cuttings as planting stocks was proved fine, the genetic diversity is high with notification that source of cuttings should be plenty.
- iii) OKI Conservation garden could be used as hedged orchard or seed source of ramin.
- iv) If there is planned to utilize the rooted cuttings from both OKI and Tumbangnusa conservation gardens, the planting stock should be separated into the Sumatera and Kalimantan population to guarantee the original genetic make-up of each population of Sumatera and Kalimantan.
- v) Wildlings, seeds, saplings, poles and parent trees of ramin became scarcely found in their natural habitat, most habitats have been changed into palm oil plantations, inhabitants, mining etc. This evidences should trigger the local government authorities and Forest Districts and other correlated Agency to immediately act, prevent or find the solution for the better condition.
- vi) *Ex situ* conservation plot is a model or example to encourage people on saving/ learning the almost extinct species of ramin bukit (hilly ramin) (*Gonystylus velutinus*, *G. maingayi* and *G. brunnescens*) as well as other endangered ramin or non- *G.bancanus* species.

### **6. Lessons Learnt**

- 1) The Activity benefited from the continued cooperation and active participation of stakeholders, Local Forestry District as well as Local Government Authorities, Forest Research Institutes, Forestry Development and Innovation Agency, the Ministry of Environment and Forestry. This enabled the ITTO-CITES secretariat to collect data, samples and informations, utilize the CFBTIR laboratory facility in order to implement the whole activities. The participation of the whole institutions, stakeholders were appreciated to the success of this activity.
- 2) Wildlings of *G. velutinus* collected from the field of Bengkulu (Taman Nasional Kerinci Seblat/ Kerinci Seblat National Park) nursed in a nursery Yogyakarta was tremendously decrease in number of alive wildlings. Of the 1050 wildlings, 800 was dead, leaving 250

wildlings as genetic material for planting in the *ex situ* conservation plot. Handling of the wildlings of ramin is not an easy work, the growth is very low and wildlings age is undetected that too old will be more difficult to transplant. Proper handling on the wildlings started from the forest until the nursery should be planned. Labors should be provided with experience and knowledge on the specific species.

- 3) Ramin Research plots in Tumbangnusa have been burned by fire during the big swamp forest fire happened in the 2015. Unfortunately, the ramin growing habitat is on the peat swamp forest. Several years already, peat swamp forest in Indonesia facing dangerous fire. Activity on ramin therefore, will be correlated with the sites, personnels and fire problems. In order to save the activity from fire, choosing the save activity sites should be carefully considered. Not only the location to be considered, but also the responsible and dedicated personnels.

## **7. Recommendations**

The conservation of Ramin (*G. bancanus*) as well as non-*G. bancanus* (*G. velutinus*, *G. brunnescens*, *G. maingayi* etc.) should be forwarded to address the extinction of ramin and non-*G. bancanus* population in the wild. Government via Ministry of Environment and Forestry should cooperate with other related Institutions to cease any crimes on forest fire, illegal logging in the Conservation Forest Areas and encroachment on forest land causing the decline of such species in the wild. Good information is that Ministry of Environment and Forestry has established a local UPT (Technical Implementing Unit) specifically for fire fighters in Indonesia.

Any research material is a valuable material to be saved, therefore, experienced personnels should be provided with knowledge, dedication on the field they have to work with.

DNA analysis is a valuable tool that should always be utilized and used to work with any conservation activity. The expensive budget on the running of the analysis is other problem to be solved.

## **1.0 ACTIVITY IDENTIFICATION**

### **1.1 Context**

Ramin (*G. bancanus*) is a fancy tree species. High demand of the wood has led to over exploitation for decades. Therefore, the ramin population decreased sharply and the species tended to be nearly extinct. It was estimated that the peatswamp forest area decreased about 53.6% and ramin potency declined about 11.4 % of the initial potency. Furthermore, the drying of peatland forest by canaling the sites (to be converted into other plantation program or else) leads to degrade the land on the fertility and ability to absorb water. Forest fire therefore always happened every year during the dry season. Fire will ruin everything on the forest floor, wildlings, seeds, parent trees disturbing the forest ecosystem balance.

Plantation has been established by several Forest concessions. Mostly plantation using wildlings and rooted cuttings. Due to the such exploitation for decades, illegal loggings, forest conversions, minings, and forest fires, ramin populations in Sumatera and Kalimantan became depleted, scattered, and decreased in size. Seed sources of ramin in Indonesia remain limited in distribution, quality and number. The effect is not only on the ramin but also on the other species such as non-*G. bancanus*. Exploration activities to ensure the existence of the rare species were implemented.

The limited in number of seed sources, populations etc, causing the plantation is limited in genetic diversity. The lack of seed sources and parent trees leads the management authority to plant using rooted cuttings. Rooted cutting is a dead end if the genetic diversity is low due to the use of very limited parents. DNA analysis is a tool to detect the genetic variability of the plantation established using rooted cuttings in Sumatera and Kalimantan.

Conservation on non-*G. bancanus* such as *G. velutinus* and *G. brunnescens* were implemented after several informations were collected from the exploration activities to Sumatera and Kalimantan. *Ex situ* conservation activity used either wildlings or rooted cuttings.

### **Activity Locations**

Locations of the activity are all in separated main Islands of Indonesia:

1. Sumatera: West Sumatera; OKI, South Sumatera; Jambi and Bengkulu
2. Bangka Island: Central Bangka
3. Kalimantan: West Kalimantan; and Tumbangnusa, Central Kalimantan.
4. Java: Yogyakarta and Sumberwringin, Bondowoso, East Java.



Figure 1. Map of location of activities (triangular shapes)

Activity 1.1: Identification of molecular genetic variation of ramin cuttings in OKI, South Sumatera and Tumbangnusa, Central Kalimantan and Activity 1.2: Identification of morphological growth variation of ramin cuttings in the conservation gardens at OKI and Tumbangnusa. Both activities were carried out in OKI and Tumbangnusa. Leaf sample collections and morphological characteristics of growth were measured at OKI and Tumbangnusa, while the DNA analyses was carried out in Yogyakarta.

Activity 2.1: Collection of ramin genetic material from OKI, South Sumatera and Central Kalimantan. Activity 2.2: DNA analysis of cuttings in OKI and Tumbangnusa. The sample collection activity was carried out in OKI and Tumbangnusa. While the DNA analysis was carried out in Yogyakarta.

Activity 3.1: Exploration on non-*G. bancanus* were carried out in several locations such as: West Sumatera, South Sumatera, Central Bangka, Bengkulu, Jambi, West Kalimantan and Central Kalimantan.

Activity 3.2: Initial establishment of *ex situ* conservation plot of non-*G.bancanus*, the collection of *G. velutinus* was carried out in Kerinci Seblat Nasional Park Bengkulu, Rejang Lebong Regency, Bengkulu Province, while nursing of the wildlings was conducted in a nursery in Yogyakarta. Planting the wildlings was carried out in *ex situ* conservation plot in Sumberwringin, Bondowoso, East Java. Other non-*G. bancanus* (*G. brunnescens*) genetic materials were collected from West Kalimantan and planted as rooted cuttings in Yogyakarta.

### Relevant national and regional policies and programmes

The population of ramin species in the natural habitat has been drastically decreasing, since the timber extraction of this species is from the natural habitat only. In order to decrease the population loss of ramin in the natural forests since 2001, logging and trade of this species has been banned or under moratorium (temporary stop of logging and trade) based on the

decree of Minister of Forestry No. 127/Kpts-IV/2001, except for forest concessionaire which have received a sustainable management certificate from the Indonesian Ecolabel Institute (LEI). In CoP 12 CITES Indonesia included ramin in the CITES Appendix III with annotation # 1 which was in effect since 6 April 2001. Annotation # 1 states that all trade of ramin parts and decorative, with a few exception like seeds, seedlings and tissue culture have to be accompanied by a CITES permit of certificate. However, illegal logging and smuggling were still increasing, some European importer countries, proposed to up-list ramin into Appendix II CITES and it was agreed by the Indonesian government. Ramin has been up-listed into Appendix II in the CITES conferences 13 in Bangkok, Thailand 2004. In order to fulfill the wood demand therefore there should be established ramin plantation in either for production or conservation forest areas.

Forest fire on 2015 has happened in peat land forests in Sumatera and Kalimantan. This caused catastrophe on the ramin forests/ populations either on the wildlings, seeds, and parent trees. Effort to collect the remaining ramin stands and the seeds or wildlings become a challenge. Conservation strategy needs to collect stands or populations in a quite number, not to mix among populations.

## 1.2 Origin and Problems to be addressed

The National Workshop on “Identification of Information Gaps towards the SFM and Conservation of Ramin and Thematic Program to be Included into the 2009 and 2010 Work Programs of the ITTO-CITES Project” held from 21-22 January 2009 in Bogor, Indonesia has emphasized the need to ensure the conservation of ramin through plant genetic resources conservation and plantation. There were two specific recommendations, namely, the conservation of plant genetic resources areas and the enhancement and restoration of ramin population through mass provision of ramin planting materials, as well as the establishment of plant genetic conservation garden (*ex situ* conservation). The status of plant genetic conservation gardens and genetic diversity of *Gonystylus* species is also needed to be addressed.

Under Phase I of the ITTO-CITES Program (Exploratory Assessment of the population distribution and potential uses of non-*Gonystylus bancanus* species), several gene pool and conservation gardens (also treated as sources of cuttings) had been initially established. One such area is located at Kedaton, near Kayu Agung in the District of Ogan Komering Ilir (OKI), South Sumatera in an ex-burnt peat swamp forest area covering 20 ha and the other is located in the Tumbangnusa Research Forest. The genetic variation of these gene pools and conservation gardens has not been evaluated, including the planted ramin using rooted cuttings. The activity, therefore, aims to assess the genetic information of these populations.

In addition, the population of *Gonystylus* species had also been assessed under Phase I of the ITTO-CITES Program (Exploratory Assessment on the population distribution and potential uses of non-*Gonystylus bancanus* species), specifically the population found in the Java Island. More exploratory assessment is needed for Sumatera, as well as for the other natural range of distribution of the species. Once the information is available, the genetic materials will be collected to enrich the existing population and to establish secure *ex situ* conservation areas.

## **2.0 ACTIVITY OBJECTIVES AND IMPLEMENTATION STRATEGY**

### **2.1 Objectives**

The main objective of the activity is to contribute to the conservation and plantation of ramin using wildlings and rooted cuttings in Sumatera and Kalimantan through genetic analysis and infusion of genetic materials to the ramin cuttings. The expected outputs are:

- Output 1      Early detection of genetic variation of ramin in the conservation gardens at OKI South Sumatera and Tumbangnusa, Central Kalimantan.
- Output 2      Genetic infusion to ramin cuttings in the conservation gardens at OKI, South Sumatera and Tumbangnusa, Central Kalimantan.
- Output 3      Exploration of *ex situ* conservation of non-*G. bancanus* species in Sumatera and Kalimantan

### **2.2 Implementation Strategy**

The activity was conducted by researchers from Center for Forest Biotechnology and Tree Improvement Research (CFBTIR) Yogyakarta and researchers from Forest Research and Development Center Bogor.

The researchers are permanent staffs of the both institutes. Communications and meetings were conducted regularly, administrative, financial works were posted by mails or phones. Several National Expert and Research Assisstant was assigned as in the Activity Document, but changing sometimes happened. The ITTO-CITES activity is part of the government activity, managed by team leader who is a government official. Some regulation especially financial requirement etc. should follow the government regulations. The implementation strategies applied in the activities are as the following:

- Output 1**      Early detection of genetic variation of ramin in the conservation gardens at OKI South Sumatera and Tumbangnusa, Central Kalimantan.
- Activity 1.1    Identification of molecular genetic variation of ramin cuttings in the conservation gardens at OKI, South Sumatera and Tumbangnusa, Central Kalimantan.
- Activity 1.2    Identification of morphological growth variation of ramin cuttings in the conservation gardens at OKI, South Sumatera and Tumbangnusa, Central Kalimantan.
- Output 2.**      Genetic infusion to ramin cuttings in the conservation gardens at OKI, South Sumatera and Tumbangnusa, Central Kalimantan.
- Activity 2.1    Collection of wild genetic resources of ramin from Sumatera and Kalimantan (Included production of rooted cuttings for Sumatera and Kalimantan).
- Activity 2.2    Genetic analysis of ramin populations in Sumatera and Kalimantan.



**Output 3.** Exploration of *ex situ* conservation of non-*G. bancanus* species in Sumatera and Kalimantan

Activity 3.1 Exploration of non-*G.bancanus* in Sumatera and Kalimantan.

Activity 3.2 Initial Establishment of *Ex situ* Conservation of non-*G.bancanus* in Sumatera and Kalimantan.

The management structure of the Activity was, the Directorate General of Forestry Research, Development and Innovation, Jakarta as the Implementing Agency.  
Center for Forestry Biotechnology and Tree Improvement Research and Development, Yogyakarta as Executing Agency.  
Forest Research and Development Center in Bogor as Collaborating Agency.

### **2.3 Assumptions and Risks**

Risks faced during the implementation of the activity were:

- Administrative procedure which quite takes time especially on the first until the third month of the activity. Field activities were not allowed to be started when the Decrees were being processed. Locations Bogor and Yogyakarta (different provinces) causing little bit trouble in communication, sending administration matters by mail etc.
- Changing and adding of National Experts and Research Assistants of some Activities automatically needed a NOL (No Objection Letters) from ITTO via Mr. Thang.
- Peat forest fires during the dry season caused loss of several conservation gardens in Tumbangnusa, as well as hampered the field and exploration activities on ramin and non-*G. bancanus* in Sumatera and Kalimantan due to smoke haze.

However, the all problems had been resolved by extending the activity until the end of March and the all activities had been implemented as outlined in the Activity Document. Meanwhile, the unspent budget due to the such problems were send back to the ITTO via bank account.

### 3.0 ACTIVITY PERFORMANCE (Activity elements planned and implemented)

#### 3.1 Performance of each activity

Activity	Percentage executed	Original Planned Completion Date	Actual Completion Date
<b>Activity 1.1</b> Identification of molecular genetic variation of ramin cuttings in the conservation gardens at OKI, South Sumatera and Tumbangnu-sa, Central Kalimantan.	100%	December 2015	December 2015
<b>Activity 1.2</b> Identification of morphological growth variation of ramin cuttings in the conservation gardens at OKI, South Sumatera and Tumbangnusa, Central Kalimantan.	100%	December 2015	December 2015
<b>Activity 2.1</b> Collection of wild genetic resources of ramin from Sumatera and Kalimantan (Included production of rooted cuttings for Sumatera and Kalimantan).	100%	December 2015	March 2016
<b>Activity 2.2</b> Genetic analysis of ramin populations in Sumatera and Kalimantan.	100%	December 2015	March 2016
<b>Activity 3.1</b> Exploration of non- <i>G.bancanus</i> in Sumatera and Kalimantan	100%	December 2015	March 2016
<b>Activity 3.2</b> Initial Establishment of Ex situ Conservation of non- <i>G.bancanus</i> in Sumatera and Kalimantan.	100%	December 2015	March 2016

### 3.2 Output Achievement

Outputs/ Activities	Achievements
<p><b>Activity 1.1</b> Identification of molecular genetic variation of ramin cuttings in the conservation gardens at OKI, South Sumatera and Tumbangnusa, Central Kalimantan.</p>	<p>Field survey has been conducted from the garden at OKI, South Sumatera and Tumbangnusa, Central Kalimantan during the project, leaf samples have been collected and processed to be a material for DNA analysis in CFBTIR laboratory, Yogyakarta. Utilizing SSR/Microsatelite and RAPD, resulted in: Genetic distance amongst the group is wide. Genetic diversity of the rooted cuttings was high, higher than that of the wildlings.</p>
<p><b>Activity 1.2</b> Identification of morphological growth variation of ramin cuttings in the conservation gardens at OKI, South Sumatera and Tumbangnusa, Central Kalimantan.</p>	<p>The measurement of morphological growth of plants, diameter and height from OKI and Tumbangnusa gardens then was analysed, resulted that there were 2 groups that could be called as variety due to the difference in size, color of leaves; branching habit (heavy and light), stem forms (sympodial and monopodial). Average growth and the survival of rooted cuttings was higher than that of wildlings.</p>
<p><b>Activity 2.1</b> Collection of wild genetic resources of ramin from Sumatera and Kalimantan (Included production of rooted cuttings for Sumatera and Kalimantan).</p>	<p>Field surveys to South Sumatera, Jambi and West, Central Kalimantan had been conducted. Rooted cuttings conducted at OKI South Sumatera, the survival rate was very low. Stocks from the cuttings was intended to infuse genetic material to the ramin plantation while the wildlings collected from West and Central Kalimantan nursed in Tumbangnusa nursery, proved survived with the survival rate varied between 21% and 87%.</p>
<p><b>Activity 2.2</b> Genetic analysis of ramin populations in Sumatera and Kalimantan.</p>	<p>DNA analysis of the leaf samples collected from the hedged orchard at OKI and Tumbangnusa resulted in: The genetic variation was varied between 0.64-0.68. The high-low genetic variation of them was affected by: i) genetic variation of population sources; ii) Distributions of the collected wildlings; iii) Number of collected wildlings and the survival. The five hedged orchard divided into two big clusters, Sumatera and Kalimantan.</p>
<p><b>Activity 3.1</b> Exploration of non-<i>G.bancanus</i> in Sumatera and Kalimantan</p>	<p>Explorations were conducted in:</p> <ol style="list-style-type: none"> <li>1) West Sumatera, Agam district, Lake Maninjau Forest of 580 m asl. Found two <i>G. maingayi</i> with dbh 48cm and height 27.2m. Only 3 wildlings found with average height of 1.3m.</li> <li>2) Bengkulu province, Rejang Lebong District. 700 m asl. Three trees of <i>G. maingayi</i>, diameter 30 cm, height 23.5cm; Two <i>G. velutinus</i>, diameter 26cm and 49cm, height 23m and 25m. <i>G. velutinus</i> was fruiting and many wildlings found on the forest floor (this was valuable information for the next collection of <i>G.</i></li> </ol>

	<p><i>velutinus</i> wildlings as planting stocks for the establishment of <i>ex situ</i> conservation in East Java).</p> <p>3) Central Bangka, Bangka Belitung Province, 49 m asl. One mature tree found with diameter of 35 cm.</p> <p>4) West Kalimantan, District Melawi:</p> <ul style="list-style-type: none"> <li>- At Km 35: 1 tree, diameter of 15.5cm, height of 12 m with 2 seedlings of height of 1.5 and 3m.</li> <li>- At Km 54: 3 wildlings, diameter of 2 cm, height 4m; diameter 6 cm, height 4.5m; diameter 2.7cm and height 2.7m.</li> <li>- At Km 84: 12 wildlings with height ranges from 0.4 to 9 m, diameter 0.8 – 5 cm.</li> </ul> <p>5) Central Kalimantan, Subdistrict Telaga Antang, Tumbang Puan Forest, 220 m asl. One mature tree and 2 wildlings; Old tree with diameter of 135cm, height 51.5m; two wildlings with height of 120 cm and 145 cm.</p> <p>The Findings: i) Most of the species in earlier records in the herbarium specimen still exist in the nature with possible significant decrease in the number of individuals or density; ii) The natural population is limited or rare in some species due to with or without significant habitat disturbances; iii) By keeping their remaining habitats, these species may naturally regenerate and therefore the existence of these species may be relatively secure for future generation.</p>
<p><b>Activity 3.2</b> Initial Establishment of Ex situ Conservation of non-<i>G.bancanus</i> in Sumatera and Kalimantan.</p>	<p>a) Planting of wildlings collected from Bengkulu Province (Kerinci Seblat National Park) to Sumberwringin Research Station in Bondowoso, East Java as <i>ex situ</i> conservation of <i>G. velutinus</i> in Java Island with the acreage of 0.35 ha.</p> <p>b) Exploration was conducted at PT. Sari Bumi Kusuma in West Kalimantan. <i>G. brunnescens</i> Airy Shaw was found based on the information of the previous surveys of Activity 3.1. Genetic material (stems) were transported to Yogyakarta to be rooted cuttings inside COFFCO plastics chamber. The survive cuttings will be planted in the same research station in Sumberwringin, Bondowoso, East Java.</p>

### 3.3 Total Amount of Expenditures and Analysis

In the term of expenditure, ITTO had disbursed a total of US\$ 125,000.00 in March 2015 (US\$ 73,500.00 for Ramin and US\$ 51,500.00 for Agarwood activity) as the first installment, and US\$ 115,520.00 (US\$ 67,950.00 for Ramin and US\$ 47,570.00 for Agarwood activity) in November 2015 as the second/ final installment to carry out the Activities that had been approved under ITTO-CITES Program. The funding was received by CFBTIR on behalf of the Government of Indonesia. CFBTIR being the

implementing agency would manage the account for the all carried out activities. The overall expenditure for the ramin activities was US\$ 136,995.72 of the total ITTO contribution of US\$ 142,139.07, leaving balance of US\$ 5,143.35. Details on the overall Financial Statement and Cash Flow Statement of the Activity are as in Annexes 1A and 1B respectively. The Government of Indonesia contribution for the same period are as reflected in the overall Financial Statement and Cash Flow Statement as in Annexes 2A and 2B respectively.

#### **4.0 ACTIVITY OUTCOME, TARGET BENEFICIARIES INVOLVEMENT**

##### **4.1 Achievement of specific objectives**

The objectives of the activity which were to contribute to the conservation and plantation of ramin using wildlings and rooted cuttings materials in Sumatera and Kalimantan through genetic analysis and infusion of genetic materials to ramin cuttings by detecting genetic variation of ramin in the conservation gardens at OKI, South Sumatera and Tumbangnusa, Central Kalimantan, to infuse the ramin cuttings in the conservation gardens at OKI and Tumbangnusa, and to explore and establish an *ex situ* conservation plot of non-*Gonystylus bancanus* in Sumatera and Kalimantan that had been accomplished.

##### **4.2 Outputs**

The above objectives were achieved through three main Outputs as the following:

- Output 1      Early detection of genetic variation of ramin in the conservation gardens at OKI South Sumatera and Tumbangnusa, Central Kalimantan.
- Output 2      Genetic infusion to ramin cuttings in the conservation gardens at OKI, South Sumatera and Tumbangnusa, Central Kalimantan.
- Output 3      Exploration and *ex situ* conservation of non-*G. bancanus* species in Sumatera and Kalimantan

##### **4.3 Impact/ Outcome**

There were findings that the genetic diversity of Hedged orchard at OKI, South Sumatera and Tumbangnusa, Central Kalimantan was quite high (0.64 – 0.68). Therefore both orchards could be used as sources of genetic material/ planting stocks to establish conservation plantation. Noted that cuttings from Sumatera should be separated from cuttings of Kalimantan, to maintain originality of the genetic make up by hampering cross breeding between different populations.

Found that there were two groups of ramin based on morphological characteristics. In order to utilize ramin as research materials, One should differentiate as there were varieties among them. So far there is no differentiation among individuals of ramin based on the morphological characteristics.

Genetic diversity of plant from cuttings is still high, therefore not to worry about plantation using rooted cuttings as rooted cuttings is a dead end strategy of tree improvement which is

meant that no more improvement strategy could be implemented. OKI conservation garden could be utilized as hedged orchard for the cuttings or source of seeds.

Plantation of ramin could be established either by using rooted cuttings, wildlings or plantlets of tissue culture. Tissue culture is a hard to do and produce plantlets, while rooted cuttings was medium and wildlings is easy to raise. Due to the rare of wildlings in the forest floor caused by fire and unfertile soil or peat etc., the wildlings was very difficult to find. Rooted cutting was the most prospective to be utilized. By utilized plantation at OKI, South Sumatera (hedge orchard in Tumbangnusa has been destructed by fire on the year 2015), rooted cuttings could be developed to mass produce planting stocks for mass planting program..

By comparing the taxonomical literatures study and visited the natural habitats of ramin in Sumatera and Kalimantan. wildlings, seeds, saplings, poles and parent trees of ramin became scarcely found in their natural habitats, mostly habitats have been changed into palm oil plantations, inhabitants, mining, based on the exploration activity carried out in Sumatera and Kalimantan. This evidences should trigger the local government authorities and Forest Districts or other correlated Agency to immediately act, prevent or find the solution for the better condition.

By the establishment of the *ex situ* conservation plot of non-*G. bancanus* (hilly ramin) such as *G. velutinus* in East Java, it can be showed that *ex situ* conservation plot is a model or example to encourage people to save/ learn on the almost extinct species of *Gonystylus velutinus*, as well as other endangered ramin or non- *G.bancanus* species such as *G. maingayi* and *G. brunnescens*.

#### **4.4 Participation of targeted beneficiaries**

Local Forest Districts, local Forestry concessions had actively participated in the exploration activities in Sumatera and Kalimantan, researchers of LIPI (Indonesian Institute of Science), researchers of Bogor Forest Research and Development Institute, researchers of Yogyakarta Center for Forest Biotechnology and Tree Improvement Research and Development (CFBTIR) was actively cooperate in the implementation of the every activities and quickly responded to the every needed information and matters related to the incoming field surveys, good cooperation of CFBTIR Office to provide the needed furnished room to work/ building that every duty could be carried out by smoothly, effective and convenience. Directorate General of Agency for Forestry Research Development and Innovation, Bureau of Overseas Cooperation, the Ministry of Environment and Forestry of Indonesia was totally dedicated in helping the secretariat by sending information about administration requirements in order the ITTO-CITES (Phase II- CFBTIR) to run the effectively activities.

#### **4.5 Intended Situation after Activity completion**

Ramin planting would be demanded due to the massive destructions of peatland forests where ramin is one of the species grows in it. Conservation would be an initial effort to save the remaining populations in the wild. Through the conservation, ramin stocks could be produced either in the form of seedlings or rooted cuttings.

Proved that genetic diversity of the rooted cuttings was higher than that of the wildlings, therefore, utilization of rooted cuttings planting stocks for plantation is recommendable. Plantation of ramin at OKI (is intended as hedged orchard to produce ramins rooted cuttings) could be maintained as healthy plantation to produce planting material for the future need.



Local Forestry District or Local Government Authority or Local Forestry Institute should make effort to raise the garden and maintain the sustainability.

Genetic diversity of the ramin plantation in OKI and Tumbangnusa conservation gardens is high, varied between 0.64 to 0.68. Conservation plots in Tumbangnusa had been destroyed by fire during 2015. The remaining conservation plot of ramin in OKI, South Sumatera should be managed properly as rooted cuttings producer. In the long run, the garden will become a mature plantation that also produce seeds as a result of cross breeding among individuals of the same populations in the garden (the original genetic make-up is sustained). Infusion of genetic material either in a form of wildlings or rooted cuttings from the wild into the garden would be possible in order to increase more genetic variability.

Explorations on either ramin or non-*G.bancanus* populations should be carried-out if infusion of genetic material to be intended in order to increase the genetic diversity of the populations. By the completion of the ITTO-CITES activity, budget will be the problem to be solved. DG of Forest Research, Development and Innovation would make effort to propose the budget for the sustainability to infuse genetic material from the wild and increase the genetic diversity in the orchard.

By the establishment of *ex situ* conservation plot/ garden of non-*G.bancanus* (*G. velutinus*) in Sumberwringin, Bondowoso, East Java, the responsible management for the garden would be CFBTIR. For the future activity, CFBTIR should plan to provide budget for the maintenance of the garden or other operational matters, otherwise, the garden will not be functioned as conservation garden producing planting stocks for plantation. *G. brunnescens* was being grown in a COFFCO plastics chamber. Several months is needed to find out how high the survival percentage of the cuttings. Again, CFBTIR could provide or plan in advance, the budget for planting the cuttings in to the field.

#### **4.6 Expectations of Activity Sustainability**

The activity produced 3 outputs: i) Early detection of genetic variation of ramin in the conservation gardens at OKI, South Sumatera and Tumbangnusa, Central Kalimantan; ii) Genetic infusion to ramin cuttings in the conservation gardens at OKI, South Sumatera and Tumbangnusa, Central Kalimantan; iii) Exploration and *ex situ* conservation of non-*Gonystylus bancanus* species in Sumatera and Kalimantan.

Detection of genetic variation on the conservation gardens found that ramin planted in the OKI plantation gardens proved high in genetic diversity (0.64 – 0.68), therefore, genetic materials either seeds or rooted cuttings derived from the gardens could be utilized as planting materials. Ministry of Environment and Forestry could utilized and benefited from the findings to sustainably planting the peatland forests.

Ramin in the garden should be differentiated into 2 varieties based on their morphological characteristics. The differentiation is important as not to ruin the statistical analysis of a specific research. It is a valuable information for the taxonomists as well. Indonesian Institute of Science (LIPI) or taxonomy division of Forest Research and Development Center in Bogor could initiate to deeply study the possibility of the ramin to be separated into two varieties.

Utilizing rooted cuttings from the OKI and Tumbangnusa gardens to be a plantation, should be separated the rooted cuttings of Jambi, Sumatera from which of Kalimantan sources. Researchers should consider about the genetic principles as not to mix or interbred between different populations as an effort to maintain their original genetic make up.

Infusion will be conducted for the garden in Tumbangnusa, Central Kalimantan. The wildlings of Ramin from the West and Central Kalimantan had been collected and raised in the nursery of Tumbangnusa. Rooted cuttings of the ramin from the wild in South Sumatera proved to be difficult to grow, with survival percentage of zero. This findings was an experience for the researchers that maintenance of the rooted cuttings is not an easy matter. Maintaining humidity and relative sterile of the nursery should be taken into account. The labors should really take care for the humidity of the soil and healthiness of their environment condition. The either CFBTIR or Local Forest District at Banjarbaru should provide for the maintenance of the ramin wildlings nursery in Tumbangnusa.

Explorations in order to prove the existance of the non-*G. bancanus* in West, South Sumatera, Bengkulu Province, Central Bangka, and West and Central Kalimantan found that almost all of the natural habitat of non-*G.bancanus* had been occupied by communities, changed into palm oil plantations and minings. Wildlings of non *G.bancanus* (*G. velutinus*) found in the National Park of Kerinci Seblat, Bengkulu Province. Almost all of the wildlings were destroyed by people to be changed into coffee plantation. There were recommended that the wildlings should be immediately collected. In one month later, CFBTIR collected the wildlings and raised in Yogyakarta nursery.

Exploration, collection on wildlings of *G. velutinus* were realized in Bengkulu Province, there were collected about 1050 wildlings and transported to Yogyakarta nursery. Healthy wildlings arrived in Yogyakarta and immediately transplanted into a polybag, placed under transparent plastics covered with paranets of 30% light intensity. Of the 1050, 250 wildlings had been planted into *ex situ* conservation plot in Sumberwringin, Bondowoso, East Java Province, occupied about 0.35 ha. Future maintenance for the *ex situ* plantation will be taken over by CFBTIR as ITTO-CITES (Phase II-CFBTIR) completed the activity on March 2016.

## **5.0 ASSESSMENT AND ANALYSIS**

- i. All the objectives were achieved during the activity period. The implementation of the activities were carried out in accordance with the agreed Activity Document. However, the extended activity with no additional budget had been proposed to finish the incomplete administrative activities as well as the delayed of the field activities at the early activity implementation.
- ii. The participation and support by the local Forest Districts as well as Forestry companies or various stakeholders proved to be helpful and appreciated during the execution of the activities. Exploration activities to the West Sumatera, South Sumatera, Bengkulu Province, Central Bangka Province, West Kalimantan and Central Kalimantan Province proved to be smoothly carried out by the contribution of Local Forestry Districts, communities as well as Local Government authorities to provide informations as well as labors. Appreciation is delivered as well to CFBTIR Yogyakarta which provided the DNA laboratory, nursery and Research plot in Sumberwringin, Bondowoso, East Java as a site to establish *ex situ* conservation of non-*G.bancanus* (*G. velutinus*).
- iii. For conservation purposes, the *ex situ* conservation plot in Sumberwringin, Bondowoso, East Java will be managed by CFBTIR Yogyakarta, fully as genetic conservation garden. For the future, no production activity for public, except for the research purposes. Expected that the plot/ garden could be functioned as show windows of an effort to conserve the rare or endangered *Gonystylus* species in Indonesia.

## **6.0 LESSONS LEARNT**

### **6.1 Project Identification and design matters**

The activity benefited from the continued cooperation and active participation of stakeholders, Local Forestry District as well as Local Government Authorities, Forest Research Institutes, Forestry Development and Innovation Agency, the Ministry of Environment and Forestry. This enabled the CFBTIR (ITTO-CITES secretariat) to gather, collect data, samples and informations, utilize the laboratory facility in order to implement the whole activities. The participation of the whole institutions, stakeholders were appreciated to the success of this activity.

The design of the activity was appropriate enough that all of the works could be implemented in one year, although longer duration of three months were preferred for the untotally finished financial and administrative work as well as for the final workshop on the results of the activities of the ITTO-CITES (Phase II-CFBTIR) 2015.

### **6.2 Operational matters**

The activity was successfully executed and implemented by CFBTIR Yogyakarta collaborated with Forest Research and Development Center, Bogor. All two installments were received and spent to implement the all activities to achieve the activity objectives.

Wildlings of *G. velutinus* collected from the field of Bengkulu Province (Taman Nasional Kerinci Seblat/ Kerinci Seblat National Park) nursed in a nursery Yogyakarta was tremendously decrease in number of alive wildlings. Of the 1050 wildlings, 800 was dead, leaving 250 wildlings as genetic material for planting in the *ex situ* conservation plot in Sumberwringin, East Java. Handling of the wildlings of ramin is not an easy work, the growth is very low and wildlings age in the natural site was undetected that too old will be more difficult to transplant. Proper handling on the wildlings started from the forest to the nursery should be properly planned. Labors should be provided with experience and knowledge on the specific species.

Ramin Research plots in Tumbangnusa have been burned by fire during the big swamp forest fire happened in the 2015. Unfortunately, the ramin growing habitat is on the peat swamp forest. Several years already, peat swamp forest in Indonesia facing dangerous fire. Activity on ramin therefore, will be correlated with the sites, personnels and fire problems. In order to save the activity from fire, choosing the save activity sites should be carefully considered. Not only location to be considered, but also the responsible and dedicated personnels.

## **7.0 CONCLUSIONS AND RECOMMENDATIONS**

The activity benefited tremendously from the cooperation of dedicated researchers, participation of various stakeholders, Local Forestry Districts and farmers.

Design of the Activity was appropriate enough so that all objectives were achievable in 15 months. The activities were implemented by CFBTIR for Ramin and Forest Research and Development Center for Agarwood activity in accordance to the proposed schedule of 12 months and a three months extention with no additional budget.

Quarterly Activity Progress Reports were submitted to Ministry of Environment and Forestry during the Activity Implementation. Completion Reports for the Ramin activities as well as Agarwood activities will be submitted around 2 months (or less) after the completion of the activity on 31 March 2016 to ITTO Yokohama, Japan as well as to the Ministry of Environment and Forestry, Indonesia.

The conservation of Ramin (*G. bancanus*) as well as non-*G.bancanus* (*G. velutinus*, *G. brunnescens*, *G. maingayi* etc.) should be forwarded to address the extinction of ramin and non-*G. bancanus* population in the wild. Government via Ministry of Environment and Forestry should hand by hand with other related Institutions to cease any crimes causing forest fire, illegal logging in the Conservation Forest Areas and encroachment on forest land causing the decline of such species in the wild.

Ministry of Environment and Forestry has established local UPT (Technical Implementing Unit) specifically for fire fighters in Indonesia. It was expected that by the establishment of the Unit, peat swamp forest fire could be mitigated or suppressed.

Any research material is a valuable material to be saved, therefore, experienced personnels should be provided with knowledge, dedication on the field they have to work with. DNA analysis is a valuable tool that should always be utilized and used to work with any conservation activity. The high cost for running of the analysis is other problem to be solved.

## **8.0 REFERENCES**

- Airy Shaw, H. K. 1953. Thymelaceae-Gonystyloideae. Flora Malesiana I, vol 4 (4):349-365.
- Airy Shaw, H. K. 1972. Thymelaceae-Gonystyloideae. Flora Malesiana I, vol 6 (6):976-982.
- Airy Shaw, H. K. 1973. Two new taxa in *Gonystylus* Teijsm. & Binnend. (Thymelaeaceae). Kew Bulletin 28(2):267-268.
- Diputra, I. M. M. M. 2013. Keragaman Genetik *Pinus merkusii* Jungh. et de Vriese Strain Tapanuli berdasarkan Penanda Mikrosatelit. Retrieved from <http://repository.ipb.ac.id/handle/123456789/63725>.
- Dirmavena, B. 2007. Keragaman dan Struktur Genetik Populasi Jati Sulawesi Tenggara Berdasarkan Marka Mikrosatelit. Retrieved from <http://repository.ipb.ac.id/handle/123456789/40551>
- Finkeldey, R., and Hattemer, H. H. 2007. Tropical Forest Genetics. Springer. Berlin.
- Frankham, R. Ballou, J.D., and Briscoe, D. A., 2002. Introduction to Conservation Genetics. Cambridge University Press. New York. USA.
- Jayusman. 2007. Degradasi sumberdaya genetik jenis ramin dan upaya penyelamatannya. *Apforgen newsletter* 4:1-4.
- Kusumadewi, Y. Poerba, Y. S. dan Partomihardjo, T. 2010. Keragaman Genetika Ramin *Gonystylus bancanus* (Miq.) Kurz] dari Provinsi Riau Berdasarkan Profil Random Amplified Polymorphic DNA. *Jurnal Biologi Indonesia* 6 (2): 173-184.

- Machfudh dan Rinaldi. 2006. Potensi, Pertumbuhan dan Regenerasi ramin (*Gonystylus bancanus* spp.) di Hutan Alam di Indonesia. Workshop Nasional "Policy Option On The Conservation And Utilization Of Ramin", Bogor.
- Perera, L., Russell, J. R., Provan, J., & Powell, W. 2000. Use of microsatellite DNA markers to investigate the level of genetic diversity and population genetic structure of coconut (*Cocos nucifera* L.). *Genome*, 43, 15–21.
- Raebilt, A., Diallo, B. Ousmane, Graudal, Lars, Dao, Madjelia and S. Josias (2003). Evaluation of a species and provenance trial of *Acacia nilotica* and *A. tortilis* at Gonse, Burkina Faso. Trial no. 11 in the arid zone series Results and Recommendation No. 10. Danida Forest Seed Centre, Humlebaek, Denmark.
- Shiraishi, S. and A. Watanabe. 1995. Identification of chloroplast genome between *Pinus densiflora* Sieb. et. Zucc. and *P. thunbergii* Parl. based on the polymorphism in *rbcl* gene. *J. Jpn. For. Soc.* 77: 429-436 (in Japanese with English summary)
- Sidiyasa, K., M. Mansur, T. Triono dan I. Rachman (2010). Panduan Identifikasi Jenis-Jenis Ramin (*Gonystylus* spp.) di Indonesia. ITTO-CITES Proyek Kerjasama dengan Pusat Litbang Hutan dan Konservasi Alam, Kementerian Kehutanan.
- Soehartono, T. and Mardiasuti, A. 2002. CITES Implementation in Indonesia. Nagao Natural Environment Foundation, Jakarta
- Tim Terpadu Ramin. 2005. Laporan Hasil Kajian Lapang Potensi Ramin (*Gonystylus bancanus* Mig. Kurz) di Areal IUPHHK PT. Diamond Raya Timber Propinsi Riau (RKT2006). Bogor
- Triono, T., Mansur, M., Waluyo, E.B., Sidiyasa, K., Yafid, B., Kalima, T., Marfuah., Ismail., Arifin., Z., Aggana. 2010. Evaluasi Kelimpahan Jenis, Populasi, Habitat dan Status Regenerasi Beberapa Jenis *Gonystylus* Terpilih (Non *Gonystylus bancanus*).
- Triono, T., Yafid, B., Marfuah, W., Kalima, T., Sumadijaya, A., Kertonegoro, Sutiyono. 2009. Literature Review on *Gonystylus* spp. other than *Gonystylus bancanus*: Botany, Ecology and Potency. Indonesia's Work Programme for 2008 ITTO CITES Project Center for Forest and Nature Conservation Research and Development Forestry Research and Development Agency, Ministry of Forestry, Indonesia.
- Wardhani, M., Yafid, B., Komar., T. E., Nurjanah, S. dan Rosita, D. T. 2010. *Gonystylus* spp, (Ramin): Population Status, Genetics and Gene Conservation. An Executive Summary, ITTO-CITES Project on Exploratory Assessment on the Population Distribution and Potential Uses of Non-*Gonystylus bancanus* species in Indonesia. Forestry Research and Development Agency, Ministry of Forestry.
- Widyatmoko, AYPBC and Aprianto. 2013. Keragaman Genetik *Gonystylus bancanus* (Mig.) Kurz. Berdasarkan Penanda RAPD (Random Amplified Polymorphic DNA). *Jurnal Penelitian Hutan Tanaman*, 3: 53-71
- Widyatmoko, AYPBC., and Rimbawanto, A. 2013. Genetic Diversity of Six Populations of *Intsia bijuga* (Merbau) Assessed by SSR Markers. The Second International Conference of Indonesia Forestry Researchers. p. 231-237
- World Conservation Monitoring Centre 1998. *Gonystylus bancanus*. The IUCN Red List of Threatened Species. Version 2015.2. <[www.iucnredlist.org](http://www.iucnredlist.org)>. Downloaded on 04 September 2015.

## Annex 1A

### ACTIVITY FINANCIAL STATEMENT (in US Dollar) ITTO CONTRIBUTION

Program Title: ITTO-CITES Program, Phase II-CFBTIR

Activity No. : 1

Period covered (ending on): 31 March 2016

Activity Title: Ensuring Genetic Diversity of Ramin Seed Sources and Ramin Population from Rooted Cuttings

Component	Original Amount (A)	Expenditures To-date			Available Funds (E) { A - D }
		Accrued (B) b/	Expended (C)	Total (D) { B + C }	
<b>I. Funds managed by Executing Agency</b>					
10. Personnel					
11. National Experts	27,220.00	-	27,220.00	27,220.00	-
12. Assistant	10,420.00	-	10,405.00	10,405.00	15.00
13. Other Labors	4,926.27	-	4,798.46	4,798.46	127.81
14. Team Leader	11,250.00	-	11,250.00	11,250.00	-
15. Project Secretary	2,880.00	-	2,880.00	2,880.00	-
<b>19. Component Total</b>	<b>56,696.27</b>	<b>-</b>	<b>56,553.46</b>	<b>56,553.46</b>	<b>142.81</b>
20. Sub-contract					
21. Sub-contract	-	-	-	-	-
<b>29. Component Total</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
30. Duty Travel					
31. DSA	39,760.00	-	39,040.00	39,040.00	720.00
32. Return Ticket	15,632.57	-	13,374.00	13,374.00	2,258.57
33. Local Transport	7,249.81	-	7,022.15	7,022.15	227.66
<b>39. Component Total</b>	<b>62,642.38</b>	<b>-</b>	<b>59,436.15</b>	<b>59,436.15</b>	<b>3,206.23</b>
40. Capital Items					
41. Office Space	-	-	-	-	-
42. Operation Vehicles	-	-	-	-	-
<b>49. Component Total</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
50. Consumable Items					
51. Materials	12,717.64	-	12,703.37	12,703.37	14.27
52. Fuels and utilities	-	-	-	-	-
53. Office Supplies	1,571.21	-	1,558.58	1,558.58	12.63
54. Other consumable Items	708.73	-	697.35	697.35	11.38
<b>55. Component Total</b>	<b>14,997.58</b>	<b>-</b>	<b>14,959.29</b>	<b>14,959.29</b>	<b>38.29</b>
60. Miscellaneous					
61. Sundry	324.77	-	319.89	319.89	4.88
62. Printing and Editing	3,000.00	-	2,977.97	2,977.97	22.03
63. Workshop package	2,674.74	-	1,854.63	1,854.63	820.11
64. Other Miscellaneous	1,114.26	-	894.33	894.33	219.93
<b>69. Component Total</b>	<b>7,113.77</b>	<b>-</b>	<b>6,046.82</b>	<b>6,046.82</b>	<b>1,066.95</b>
70. Executing Agency Management					
Executing Agency Management cost (10% of total Of overall project budget activity)	-	-	-	-	-
<b>79. Component Total</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>100. GRAND TOTAL:</b>	<b>141,450.00</b>	<b>-</b>	<b>136,995.72</b>	<b>136,995.72</b>	<b>4,454.28</b>

Exchange rate: 1USD = IDR 12.930 (first installment)

Exchange rate: 1USD = IDR 13.620 (second installment)

**Note:** Budget Components are those detailed in the Activity Document.

- a/ The **Cash Flow Statement must be completed first**, before the other inputs into this Financial Statement;
- b/ Accrued expenditure: expenditures incurred during the reporting period, but not yet settled;
- c/ Amounts under the "Expended" column will be transferred automatically from the Cash Flow Statement (with direct link); and
- d/ Refer to the notes in the Cash Flow Statement for the supporting **information and documents** that are to be submitted to the ITTO Secretariat.



# Annex 1B

## ACTIVITY CASH FLOW STATEMENT (in US Dollar) ITTO CONTRIBUTION

Program Title: ITTO-CITES Program, Phase II-CFBTIR

Activity No. : 1

Period covered (ending on): 31 March 2016

Activity Title: Ensuring Genetic Diversity of Ramin Seed Sources and Ramin Population from Rooted Cuttings

Component	Reference	Date	Amount	
			in US \$	Local Currency In IDR
<b>A. Funds received from ITTO:</b>				
1. First installment		March-2015	73,500.00	950,355,000.00
2. Second Installment		November-2015	67,950.00	925,479,000.00
3. Gain or losses from exchange rate			703.07	-
4. Cost of transfer first installment*)		March-2015	7.00	90,510.00
5. Cost of transfer second installment *)		November-2015	7.00	95,340.00
<b>Total Funds Received:</b>			<b>142,139.07</b>	<b>1,875,648,150.00</b>
<b>B. Expenditures (by Executing Agency):</b>				
10. Personnel				
11. National Experts			27,220.00	351,954,600.00
12. Assistant			10,405.00	134,867,850.00
13. Other Labors			4,798.46	62,960,000.00
14. Team Leader			11,250.00	147,015,000.00
15. Project Secretary			2,880.00	37,735,200.00
<b>19. Component Total</b>			<b>56,553.46</b>	<b>734,532,650.00</b>
20. Sub-contract				
21. Sub-contract			-	-
<b>29. Component Total</b>			<b>-</b>	<b>-</b>
30. Duty Travel				
31. DSA			39,040.00	513,508,800.00
32. Return Ticket			13,374.00	177,987,495.00
33. Local Transport			7,022.15	92,926,500.00
<b>39. Component Total</b>			<b>59,436.15</b>	<b>784,422,795.00</b>
40. Capital Items				
41. Office Space			-	-
42. Operation Vehicles			-	-
<b>49. Component Total</b>			<b>-</b>	<b>-</b>
50. Consumable Items				
51. Materials			12,703.37	169,796,300.00
52. Fuels and utilities			-	-
53. Office Supplies			1,558.58	20,838,750.00
54. Other consumable Items			697.35	9,143,000.00
<b>55. Component Total</b>			<b>14,959.29</b>	<b>199,778,050.00</b>
60. Miscellaneous				
61. Sundry			319.89	4,346,910.00
62. Printing and Editing			2,977.97	40,560,000.00
63. Workshop package			1,854.63	25,260,000.00
64. Other Miscellaneous			894.33	12,043,000.00
<b>69. Component Total</b>			<b>6,046.82</b>	<b>82,209,910.00</b>
70. Executing Agency Management				
Executing Agency Management cost (10% of total Of overall project budget activity)			-	-
<b>79. Component Total</b>			<b>-</b>	<b>-</b>
<b>Total Expenditures To-date:</b>			<b>136,995.72</b>	<b>1,800,943,405.00</b>
<b>Remaining Balance of Funds (A-B):</b>			<b>5,143.35</b>	<b>74,704,745.00</b>

Exchange rate: 1USD = IDR 12.930 (first installment)

Exchange rate: 1USD = IDR 13.620 (second installment)

**Notes:**

- (1) Amounts in U.S. dollars are converted using the average rate of exchange when funds were received by the Executing Agency;
- (2) Amount of expenditures in US dollar should be the same as amount shown in column (c) of the Financial Statement (with direct link from the Cash Flow Statement);
- (3) Provide a **list of all expenditure components** (listing the expenditures on excel format, showing date, payee, category/components of expenditures and the amount, both in local currency and in US dollar);
- (4) Submit all **actual supporting payment documents/evidences** (filed in the same sequence as the entries in the list of expenditures in (3) above); and
- (5) Submit **bank reconciliation statements** along with the bank statement to support the remaining balances/funds in the Cash Flow Statement.

Cost of transfer*			
The cost of transfer for first installment	\$	7.00	Rp 90,510.00
The cost of transfer for first installment	\$	7.00	Rp 95,340.00

## Annex 2A

### ACTIVITY FINANCIAL STATEMENT (in US Dollar) GOVERNMENT OF INDONESIA CONTRIBUTION

Program Title: ITTO-CITES Program, Phase II-CFBTIR

Activity No.:1

Period covered (ending on): 31 March 2016

Activity Title: Ensuring Genetic Diversity of Ramin Seed Sources and Ramin Population from Rooted Cuttings

Component	Original Amount (A)	Expenditures To-date			Available Funds (E) { A - D }
		Accrued (B) b/	Expended (C)	Total (D) { B + C }	
<b>I. Funds managed by Executing Agency</b>					
10. Personnel					
11. National Experts	-	-	-	-	-
12. Assistant	-	-	-	-	-
13. Other Labors	-	-	-	-	-
14. Team Leader	-	-	-	-	-
15. Project Secretary	-	-	-	-	-
<b>19. Component Total</b>	-	-	-	-	-
20. Sub-contract					
21. Sub-contract	-	-	-	-	-
<b>29. Component Total</b>	-	-	-	-	-
30. Duty Travel					
31. DSA	-	-	-	-	-
32. Return Ticket	-	-	-	-	-
33. Local Transport	-	-	-	-	-
<b>39. Component Total</b>	-	-	-	-	-
40. Capital Items					
41. Office Space	10,000.00	-	10,000.00	10,000.00	0.00
42. Operation Vehicles	1,000.00	-	1,000.00	1,000.00	0.00
<b>49. Component Total</b>	<b>11,000.00</b>	-	<b>11,000.00</b>	<b>11,000.00</b>	<b>0.00</b>
50. Consumable Items					
51. Materials	-	-	-	-	-
52. Fuels and utilities	-	-	-	-	-
54. Other consumable Items	-	-	-	-	-
<b>55. Component Total</b>	-	-	-	-	-
60. Miscellaneous					
61. Sundry	-	-	-	-	-
62. Printing and Editing	-	-	-	-	-
63. Workshop package	-	-	-	-	-
64. Other Miscellaneous	-	-	2,977.97	2,977.97	- 2,977.97
<b>69. Component Total</b>	-	-	<b>2,977.97</b>	<b>2,977.97</b>	- <b>2,977.97</b>
70. Executing Agency Management					
Executing Agency Management cost (10% of total Of overall project budget activity)	14,145.00	-	14,145.00	14,145.00	0.00
<b>79. Component Total</b>	<b>14,145.00</b>	-	<b>14,145.00</b>	<b>14,145.00</b>	<b>0.00</b>
<b>100. GRAND TOTAL:</b>	<b>25,145.00</b>	-	<b>28,122.97</b>	<b>28,122.97</b>	<b>-2,977.97</b>

Exchange rate: 1USD = IDR 12.930 (first installment)

**Note:** Budget Components are those detailed in the Activity Document.

- a/ The **Cash Flow Statement must be completed first**, before the other inputs into this Financial Statement;
- b/ Accrued expenditure: expenditures incurred during the reporting period, but not yet settled;
- c/ Amounts under the "Expended" column will be transferred automatically from the Cash Flow Statement (with direct link); and
- d/ Refer to the notes in the Cash Flow Statement for the supporting **information and** documents that are to be submitted to the ITTO Secretariat.

## Annex 2B

### ACTIVITY CASH FLOW STATEMENT (in US Dollar) GOVERNMENT OF INDONESIA CONTRIBUTION

Program Title: ITTO-CITES Program, Phase II-CFBTIR

Activity No. : 1

Period covered (ending on): 31 March 2016

Activity Title: Ensuring Genetic Diversity of Ramin Seed Sources and Ramin Population from Rooted Cuttings

Component	Reference	Date	Amount	
			in US\$	Local Currency In IDR
<b>A. Funds received from GoI:</b>				
1. First instalment		March-2015	25,145.00	325,124,850.00
2. Second Instalment				
3. Third instalment				
4. Fourth instalment				
5. Interest on bank deposits				
<b>Total Funds Received:</b>			<b>25,145.00</b>	<b>325,124,850.00</b>
<b>B. Expenditures (by Executing Agency):</b>				
10. Personnel				
11. National Experts			-	-
12. Assistant			-	-
13. Other Labors			-	-
14. Team Leader			-	-
15. Project Secretary			-	-
<b>19. Component Total</b>			<b>-</b>	<b>-</b>
20. Sub-contract				
21. Sub-contract			-	-
<b>29. Component Total</b>			<b>-</b>	<b>-</b>
30. Duty Travel				
31. DSA			-	-
32. Return Ticket			-	-
33. Local Transport			-	-
<b>39. Component Total</b>			<b>-</b>	<b>-</b>
40. Capital Items				
41. Office Space			10,000.00	129,300,000.00
42. Operation Vehicles			1,000.00	12,930,000.00
<b>49. Component Total</b>			<b>11,000.00</b>	<b>142,230,000.00</b>
50. Consumable Items				
51. Materials			-	-
52. Fuels and utilities			-	-
53. Office Supplies			-	-
54. Other consumable items			-	-
<b>55. Component Total</b>			<b>-</b>	<b>-</b>
60. Miscellaneous				
61. Sundry			-	-
62. Printing and Editing			-	-
63. Workshop package			-	-
64. Other Miscellaneous			-	-
<b>69. Component Total</b>			<b>-</b>	<b>-</b>
70. Executing Agency Management Executing Agency Management cost (10% of total Of overall project budget activity)			14,145.00	182,894,850.00
<b>79. Component Total</b>			<b>14,145.00</b>	<b>182,894,850.00</b>
<b>Total Expenditures To-date:</b>			<b>25,145.00</b>	<b>325,124,850.00</b>
<b>Remaining Balance of Funds (A-B):</b>			<b>0.00</b>	<b>0.00</b>

Exchange rate: 1 USD = IDR 12.930 (first installment)

- Notes:**
- (1) Amounts in U.S. dollars are converted using the average rate of exchange when funds were received by the Executing Agency;
  - (2) Amount of expenditures in US dollar should be the same as amount shown in column (c) of the Financial Statement (with direct link from the Cash Flow Statement);
  - (3) Provide a **list of all expenditure components** (listing the expenditures on excel format, showing date, payee, category/components of expenditures and the amount, both in local currency and in US dollar);
  - (4) Submit all **actual supporting payment documents/evidences** (filed in the same sequence as the entries in the list of expenditures in (3) above); and
  - (5) Submit **bank reconciliation statements** along with the bank statement to support the remaining balances/funds in the Cash Flow Statement.



Figure 1. Several growth variability on ramin: monopodial and sympodial stems; size and color of the leaves; and light and heavy branching.



**Kebun konservasi ramin OKI, Sumatera Selatan**

Figure 2. Leaf color variability on ramin plantation at OKI and Tumbangnusa



**KHDTKTumbang Nusa, Kalimantan Tengah**

Figure 3. Location for collecting genetic materials (leaves)



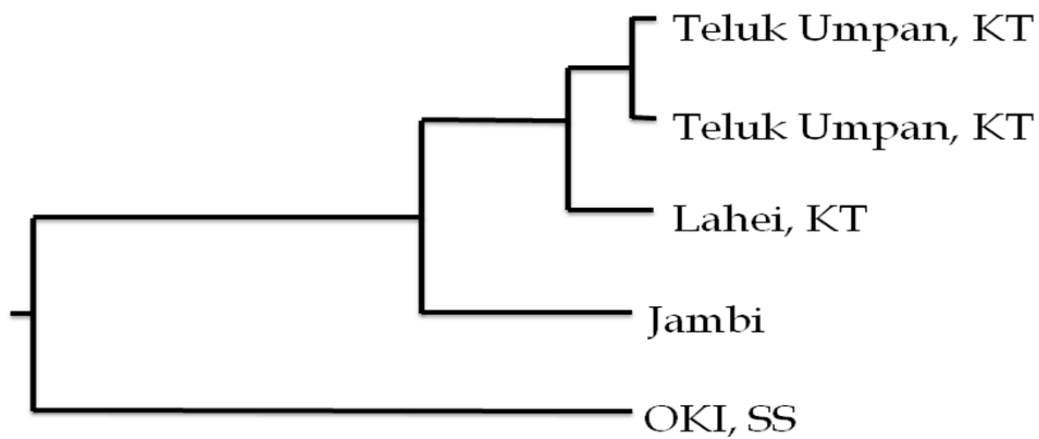


Figure 4. Dendrograph of 5 populations of ramin in Sumatera and Kalimantan based on UPGMA



Figure 5. Location of exploration on *G. velutinus* in Bengkulu; mother tree and the wildlings



Figure 6. *Gonystylus maingayi* Hook.f.  
In Bukit Pucung Forest, Kerinci Seblat National Park, Rejang Lebong, Bengkulu



Figure 7. *Gonystylus brunnescens* Airy Shaw in Belaban Ella Forest, Melawi, West Kalimantan

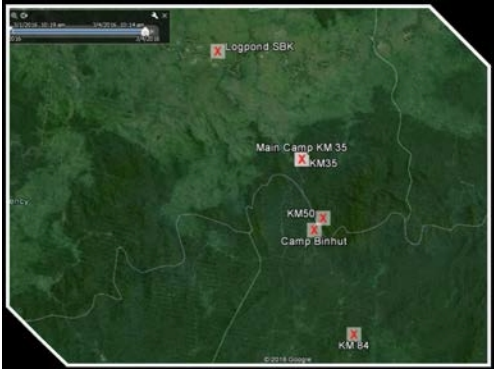


Figure 8. Map of exploration locations



Figure 9. COFFCO plastics chamber and Cuttings

**Responsible for the Report**

Name: M. Charomai

Position held: Activity Team Leader

Date : June 2016





Agency for Research, Development and Innovation  
Center for Biotechnology and Tree Improvement  
Research and Development  
Jalan Palagan Tentara Km. 15, Purwobinangun  
Pakem, Sleman - Yogyakarta  
Phone. + 62 – 274 – 895954  
Fax: + 62 – 274 - 896080  
Email: [ramgaryogya@gmail.com](mailto:ramgaryogya@gmail.com)

