[Attachment-A]

AFoCO Project Document

Project code	AFoCO/013/2020

Project Profile			
Project title	**Improving *Pinus caribaea* Morelet for plantation on degraded land in Viet Nam's northern mountainous region.**		
Project duration	Estimated start date: 1st July, 2020 Estimated end date: 31th December, 2023		
Implementing Agency	Forest Science Centre of North-Eastern Viet Nam (FSNE)		
Participating countries	Viet Nam		
Project site	Northern mountainous region of Viet Nam		
Main objective	Improving the productivity and supply of high-quality *Pinus caribaea* Morelet in order to adapt to climate change and meet raw material requirement for timber processing.		
Target Area[1]	Primary Target Area: **Forest restoration and rehabilitation** Secondary Target Area: N/A		
Budget and source of finance	Total: US$ ***576,200*** - AFoCO: US$ ***486,000*** - National: US$ ***90,200*** - Others: US$ _____ (to be specified)		
Proponent Profile			
Name/ Position	Dr. Le Minh Cuong Position: Director	Signature Date	
Organization	Forest Science Centre of North-Eastern VietNam (FSNE)		
Address	Ngoc Thanh Commune, Phuc Yen Town, Vinh Phuc Province, Viet Nam		
Contact	Tel: +84.211.3856.022	Fax: +84.211.3856.022	Email: buitrongthuy@gmail.com

[1] Refer to the list of target areas which is in accordance with the objectives and prevailing strategic plan of AFoCO (provided by the Secretariat).

LIST OF CONTENTS

SUMMARY **1**

SECTION A. PROJECT CONTEXT **3**

1. Background 3

2. Conformity with AFoCO's objectives and strategic priorities 4

3. Regionality 5

4. Information on project target area 6

4.1. Geographic information 6

4.2. Environmental information 7

4.3. Socio-Economic information 7

SECTION B. RATIONALE AND OBJECTIVES **10**

1. Rationale 10

1.1. Stakeholder analysis 10

1.2. Problem analysis 12

1.3. Logical framework matrix 12

1.4. Justification 18

2. Objectives 18

2.1. Main objective (development objective) 18

2.2. Specific objective(s) and success criteria & indicators 18

SECTION C. DESCRIPTION OF PROJECT INTERVENTIONS **19**

1. Work Plan and Schedule 19

2. Budget (USD) 24

SECTION D. IMPLEMENTATION ARRANGEMENTS **7359**

1. Organizational structure 7359

2. Staff resource plan 7359

3. Reporting and monitoring arrangements 60

4. Risk management and sustainability 60

4.1. Assumptions and risks *60*

4.2. Sustainability *60*

LIST OF FIGURES

Figure 1. Map of the project site location 6

Figure 2. Problem tree 13

Figure 3. Organizational chart 59

LIST OF TABLES

Table 1 Stakeholder analysis table 10

Table 2. Logical framework matrix 12

[Attachment-A]

Abbreviations and Acronyms

AFoCO	Asian Forest Cooperation Organization
FIRI	Forest Industry Research Institute
FTIBRI	Forest Tree Improvement and Biotechnology Research Institute
FSNE	Forest Science Centre of North-Eastern Viet Nam
MARD	Ministry of Agriculture and Rural Development of Viet Nam
NTFP	Non-Timber Forest Products
PMU	Project Management Unit
PSC	Project Steering Committee
TCVN	Vietnamese standard
VNForest	Vietnam Administration of Forestry

[Attachment-A]

SUMMARY

The problems to be addressed

With strongly slopping and craggy topography, Viet Nam's northern mountainous region has been facing the increasing degradation of forest land due to a huge amount of annual average rainfall, from 1,800 to 2,000 mm/year, and unsustainable farming methods. According to the United Nations report, Viet Nam is among some countries that to be the most vulnerable to climate change. Land degradation has become more and more serious in mountainous areas, particularly in northern mountainous region. In order to tackle this situation, Viet Nam has been a signatory to the United Nations Convention to Combat Desertification since 1992. On 2 September 2006, the Government issued the Decision No. 204/2006/QD-TTg on promulgating the national action program to combat desertification, which prioritizes the application and transfer of new science and technology to mountainous regions with the aim of enhancing capacity and education as well as raising awareness on "desertification". Desertification and other causes, such as climate change, have led to "land degradation" with the reduction or loss of biological productivity and economic benefits of land which has directly affected lives of people, especially of those who live in high-slope mountainous areas.

Selecting appropriate varieties that can grow on degraded land while maintaining sustainable yield and adapt to adverse effects of climate change is a challenge for scientists. In addition to cultivation solutions and technologies in dry and decertified areas, appropriate varieties have been researched and selected in order to adapt to these harsh conditions. Recognizing the impacts of climate change, with the aim of enhancing the adaptability to climate change to ensure sustainable development, Ministry of Agriculture and Rural Development (MARD) issued the "Framework action plan on climate change adaptation for all bodies involved in agriculture and rural development sector in the 2008-2020 period", with focus on the upland and mountainous areas, which are considered as the most vulnerable to climate change.

Pinus caribaea Morelet (hereinafter referred to as *P. caribaea*) is a fast-growing and good-wood variety which is suitable for plantation of large-timber forest on degraded land in some ecological areas across the country. However, the plantation of *P. caribaea* forests has been facing difficulties due to the lack of improved high-quality *P. caribaea* seedlings. This variety has been tested and grown in many ecological areas and it has some advantages such as rapid growth, easy adaptation to different habitats and good endurance to poor land. Thus, it has been identified as a breakthrough scientific and technological solution to improve the productivity and quality of plantation forests, thereby contributing to the expansion of planted production forests on degraded land which also contributes to the increase of plantation forests, increase of income for people involving in forest plantation in mountainous areas and provision of raw materials for timber processing industry, thereby enhancing value and competitiveness of timber and timber products in the domestic and export markets.

The project will apply value-chain approach ranging from high-quality seedling production, forest plantation, forest product processing to marketing. The project will also develop and replicate demonstration models in localities that have advantages in forestry development, especially in difficult mountainous provinces, in which the project will contribute to income generation and livelihood improvement for local people.

Goals

To develop *P. caribaea* forests on degraded land in northern mountainous region by improving high-quality seedling production, developing intensive cultivation technique and

appropriate *P.caribaea* timber processing and preservation technology to meet market demands and provide raw materials for timber processing industry.

Objectives

1) To improve high-quality *P. caribaea* seedling production by selection of at least 150 plus trees from seed orchards and other relevant sources; development of 10ha of transformed seed stands and 4ha of seed orchards; completion of sexual and asexual propagation techniques to create high-quality seedlings and transfer them to production.

2) To develop and transfer the guideline of intensive forest plantation to production by plantation of 11ha of model forest from created seedlings.

3) To propose and develop appropriate techniques to use *P. caribaea* timber in timber processing industry to meet market demands.

Interventions needed to resolve the problem

The project is implemented on the basis of value chain from seedling production, forest plantation, and forest product processing to marketing.

The supply of seedlings is improved through the application of science and technology into propagation methods by seeds, cuttings and tissue culture; the establishment of seed orchards to provide high-quality seeds; manpower training and technology transfer to forestry organizations and businesses for application into forest production and business.

Selected seedlings are used and appropriate silvicultural methods are applied into the plantation of *P. caribaea* forest to supply large timber.

The value of *P. caribaea* timber is enhanced through market research (with focus on Korean market) and application of appropriate processing and preservation techniques, 1 to 2 sample products made of *P. caribaea* timber that meet market demands are initially processed.

Trainings on transfer of technical guideline of high-quality seedling production, intensive forest plantation and *P. caribaea* timber processing technology to forestry organizations and businesses in the region are carried out.

SECTION A. PROJECT CONTEXT

1. Background

In previous years, in spite of difficulties, Viet Nam has been making great efforts to re-forest barren land and bare hills, increase forest cover, gradually restore poor natural forests to better-quality forests. Annually, Viet Nam has grown nearly 230,000 ha of concentrated plantation forests, of which more than 90% of area is production forests in order to supply raw materials for timber processing industry. However, due to land degradation, poor nutrition and severe climate combined with backward extensive farming practices, the access to and effective application of advanced technologies remain limited. Moreover, the productivity of plantation forests remains low, only 8-10m^3/ha/year for the reason that the quality of seedlings is not up to standard. Therefore, it is urgent to research technical measures to select high-quality seedlings in order to increase productivity of forests planted on degraded land.

Raw materials from domestic plantation forests do not meet the increasingly high demands for materials for timber processing industry in general and for exported timber processing in particular. As estimated by Viet Nam Timber and Forest Product Association, total volume of plantation timber of 2017 is expectedly reached 23 million m3 of logs, but most of this output is used for production of woodchip, meanwhile less than 20% is used for lumber production. As such, one of top priorities of Viet Nam's forestry sector is to improve quality of seedlings in order to create high-yield plantation forests and supply high-quality raw materials for timber processing industry.

So as to meet the increasing demand for timber, especially large timber for furniture production, forest plantation has been carried out for many years but the productivity and economic efficiency of plantation forests has been remained low due to backward farming practices and increase of degraded land area. Thus, on 16 June 2017, the Prime Minister issued the Decision No. 886/QD-TTg on approval of the target program for sustainable forest development for the period 2016-2020. As regulated in the Decision, key objectives include: afforestation and post-harvesting reforestation: 1,025,000ha, including 200,000ha of intensive plantation forests for large timber; transformation from small-timber plantation forests into large-timber plantation forest: 90,000ha; the proportion of plantation forests under the control of seed quality: 75-80%. Forest production is organized by supply chain from plantation, raw material purchase, processing and marketing.

P. caribaea, which is naturally distributed in the Caribbean countries and islands, is a photophilic species, having large timber with the diameter of over 100cm. This species has been early introduced and planted in the country. It has been shown that this species has superior characteristics than other native pine species such as rapid growth, good stem shape and good resistance to insects and diseases (Phi Quang Dien, 1989; Phan Thanh Huong, 2002). Through the study on the plantation of *P. caribaea* on some soil types in the Northeast region in the period 2000-2004, which was carried out by Forest Science Centre of North-Eastern Viet Nam, 25ha of *P. caribaea* forest have been planted in 5 Northeastern provinces, including Cao Bang, Lang Son, Thai Nguyen, Bac Giang and Vinh Phuc. The study also showed that *P. caribaea* species has been well grown on poor barren land and bare hills and its growth is faster than *P.kesiya* and *P. massoniana* Lamb species of the same age.

P. caribaea variety planted in Viet Nam is *P. caribaea* var *hondurensis*, which has been selected for research in Dai Lai – Vinh Phuc since 1968 based on the assessment that this variety is the best-growing mutation. This variety has been selected and recognized as

technically advanced seedling (according to the Decision No. 3614/QD-BNN- KHCN dated 8 August 2001 by Minister of MARD). Despite its potential growth, this species has not been widely planted due to the lack of high-quality seed sources because of the limitation of seeds from seed orchards. Thus it is essential to research and develop *P. caribaea* seedlings in order to ensure improved seedlings for forest plantation.

P. caribaea was planted on almost area of the FSNE and the mean annual increment in volume of 30m^3/ha/year at 10 years of age. In the report of technologies and sciences summary for project "Scientific and technical solutions for wood material development for export" (Nguyen Huy Son, 2006), *P. caribaea* was intensively planted with density of 1,330 trees/ha, the average increment is 4.7cm in diameter and 2.3m in high after 2.5 years. The result in the other research on intensive planting techniques system of *Acacia*, *Eucalyptus* and *P. caribaea* for supplying large timber pointed out that the accordance density is 1,100 trees/ha and the growth can reach 17m^3/ha/year at 4 years of age, the results also indicate that *P. caribaea* can be planted in the site with the lowest absolute temperature of 6-12^oC.

This proposed project is relevant to the forestry and wood industry development policies of VietNam.

Following are the key policies that are in favor of project implementation:

✓Decision No. 57/QD-TTg dated 09 January, 2012 of the Prime Minister "Approving the Forest Protection and Development Plan 2011-2020"

✓Decision No. 774/QD-BNN-TCLN dated 18 April, 2014 of the Ministry of Agriculture and Rural Development "Approve the Action Plan to improve the productivity, quality and value of planted forests in the period 2014-2020"

✓Decision No. 4961/QD-BNN-TCLN dated 17 November, 2014 of the Ministry of Agriculture and Rural Development "Promulgating the list of major species for forest plantation and main species for plantation in each environmental region"

✓Decision No. 886/QD-TTg dated 16 June, 2017 of the Prime Minister "Program for Sustainable Forestry Development for the period 2016 – 2020".

Based on that fact, the project is very necessary to help Viet Nam select appropriate seedlings for plantation of high-yield forest on degraded land in the northern mountainous region. This project will contribute to increasing effectiveness of forest plantation, improving livelihoods of local people, mitigating and adapting to negative impacts of climate change, ensuring the harmony between environmental protection and livelihood maintenance.

2. Conformity with AFoCO's objectives and strategic priorities

The vision of the Asian Forest Cooperation Organization (AFoCO) is to contribute to enhancing regional forestry cooperation in terms of technology and policy through specific activities for a greener Asia. As an inter-governmental organization, AFoCO will establish a legal framework and develop capacity to implement cooperative activities in the forestry sector towards sustainable development. Cooperative activities will be implemented in medium and long-term periods. All cooperative activities are inter-related and synchronously carried out.

Deforestation and forest degradation are common problems in many countries around the world. Most of Asian countries, except for a small number of countries, have experienced lesson-learnt from the reduction of forest cover over many years due to the shift from forest land into agricultural and industrial purposes, population growth and other land use purposes leading to deforestation which is considered as a major contributor to global warming. Within the global efforts to prevent deforestation and forest degradation, AFoCO will develop and implement key activities to contribute to this course.

With the aim of strengthening sustainable forest management in environmental, economic and social aspects, AFoCO will help reduce deforestation and desertification which are caused by human activities and climate change. AFoCO will address challenges for sustainable development and livelihoods of millions of people in the course of hunger elimination and poverty reduction. Besides, AFoCO takes into consideration the important roles of capacity building and technology transfer in the development process of many developing countries. Limited capacity will be a deterrent to the development of the country. AFoCO will boost the cooperation among regional countries to support the development of member countries.

Based on priorities of member countries, AFoCO Council has endorsed the AFoCO Strategic Plan for the 2018-2022 period. Accordingly, the following 5 priority areas have been set out to strengthen cooperation among member countries, contributing to the development of the forestry sector in the region:

- Initiating customized reforestation models
- Supporting research and development in climate change adaptation approaches
- Introducing systematic management on forest-related disasters
- Local livelihood improvement through forest-related activities
- Strengthening organizational capabilities and regional actions

In accordance with AFoCO's orientation, the project focuses on establishment of seedling supply system for forest plantation and development of rehabilitation model of forests planted on degraded land aiming at improving livelihoods of local people and adapting to negative impacts of climate change. Therefore, this project proposal is in line with the priority area 1 of the AFoCO Strategic Plan in the 2018-2022 period which is forest restoration and rehabilitation.

3. Regionality

Southeast Asia is the region with the highest rate of deforestation in the world, which has lost 14.5% of its forest area over the past 15 years, and may have lost more than 50% of its natural forest cover. The main cause leading deforestation is the conversion forest land to agricultural purpose. In addition, planning to build hydroelectric power plants of the countries on the Mekong River in the future will strongly decrease the forest area in this region. That can reduce the number of plant and animal species in the region by 20-70%.

Facing the same disadvantage condition as countries in the region, Viet Nam is one of the most affected countries by global warming and sea level rising in the world that causes a large area of Viet Nam's coastal sinking under the water. Beside that the flood and drought are appeared with high frequency, which is the cause reducing the productivity of plant in this area, directly affecting to income of the local people living in the mountainous area. This problem is a top priority of the government, to deal with these challenges the government issued lot of solutions about sciences and technology to mitigate and adapt to climate change.

One of the solutions is to select and create the new species which can withstand with the hard environment.

P. caribaea can grow on harsh sites and a drought tolerance species which is one of the key species on the priority list for afforestation in the northern mountains area of Viet Nam.

The project proposal aims to rehabilitate plantation forest ecosystem by planting improved high-quality seedlings on degraded land in the north of Viet Nam as well as in Mekong sub-region countries which have similar natural conditions to Viet Nam in order to adapt to climate change. When the project is completed, project technical staff can exchange experience with regional countries on plantation and rehabilitation of forests on degraded land. Additionally, improved seedlings will be widely introduced so as that they are able to be developed to increase the productivity of plantation forests and rehabilitate forests on degraded land. Plantation and rehabilitation of degraded forest regions is an urgent issue for Southeast Asian countries, so the project demonstration model and lesson-learnt which will be applied for the local farmers and also for the other regions which have the same environmental site condition for increasing farmers' knowledge of intensive planting for the high economic value purpose and adaptation to the hard environmental conditions in the current years. The experiences and lessons learnt from implementation project will be shared through international conferences and publications that would be of great significance for exchanging and sharing with countries in the Mekong sub-region.

4. Information on project target area

4.1. Geographic information

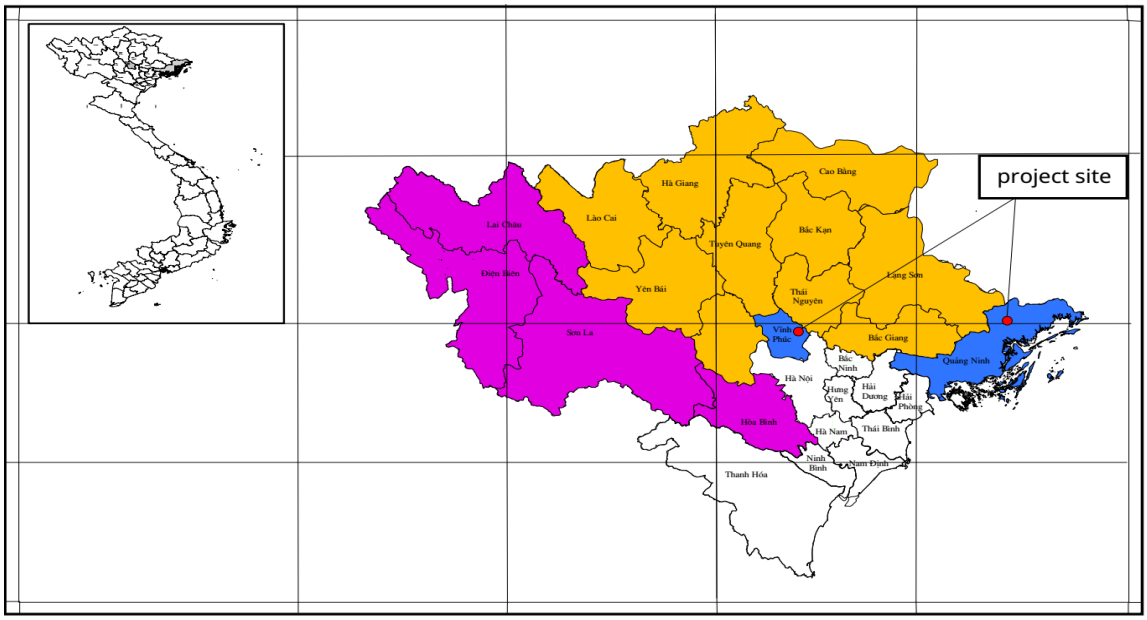

Figure 1. Map of the project site location

The northern mountainous region contains both medium and high mountains. This is the highest, craggiest and most fragmented terrain of Viet Nam. The common topographies are

high mountain ranges, deep valleys, medium-high limestone plateaus. The highest mountain range is Hoang Lien Son with many peaks above 2,500 m and the highest peak is Fansipan with the height of 3,143m (above sea level).

There are 15 provinces in the region, including: Ha Giang, Cao Bang, Lao Cai, Bac Kan, Lang Son, Tuyen Quang, Yen Bai, Thai Nguyen, Quang Ninh, Phu Tho, Bac Giang, Lai Chau, Dien Bien, Son La, Hoa Binh. The regional centers are the city of Thai Nguyen and the city of Viet Tri. Total area of the region is 9,526,440 ha, accounted for 29.2% of total area of the country. The area of forested land is 5,612,045 ha, accounted for 42.67% of total forested land of the country, of which the area of natural and plantation forests is 4,474,004 ha and 1,138,041 ha, respectively.

Soil in the region is mostly feralit on shale, limestone and other mother stones together with ancient alluvium (in midland) and alluvial soil along valleys of rivers. Feralit soil in the region has thick weathering layer and is rich in mineral elements such as iron, manganese, which is suitable for growing forest and industrial trees.

4.2. Environmental information

The northern mountainous region has tropical monsoon climate with the annual average temperature of 25-26^{o}C, rainfall of 1,400-1,600mm, and total radiation from 8,500–9,000^{o}C which is appropriate for tropical agro-forestry production. The climate is divided into hot and cold seasons, of which the winter lasts from November to May with the average temperature of below 13^{o}C. The climate in the region is strongly influenced by the northeast monsoon that makes the region a coldest winter in the country.

In addition, the weather in the region is complex and disturbing, frost and heavy cold directly affect the productivity of crops. Meanwhile, the complexity of climate requires investment in research to develop a crop structure that meets ecological condition.

4.3. Socio-Economic information

Population and labour forces

Currently, the population and labour forces in the northern region are rather crowded with the density of 100 - 300 people/km^2 because this region is continuously supplemented with labours from the Red River Delta, who are experienced in the agricultural production, which is the driving force for regional economic growth. This region is also inhabited by some ethnic minorities such as Tay, Nung, Thai, Muong, Dao with diversified cultures, customs and cultivation experience. However, this region is still lacking skilled labor forces, especially in the border areas. Furthermore, the population and labor forces distribute differently in the region, and mostly focusing in cities and towns. The regional economic structure is backward and slowly moving, the value of industrial production within the GDP structure is less than 30%. The average income per capita remains the lowest, about 500 USD, according to statistics in 2010, while the average income per capita of the whole country is 1,300 USD. According to the Resolution No. 30a/2008 NQ-CP, this region contains a lot of poor households, which accounts for 29.3% of total population. The backwardness and shifting cultivation are still happening in some ethnic groups.

Infrastructures

The region has been early invested, so its infrastructure has been relatively developed, particularly in urban areas. The regional transportation network includes both important national highways and old railway lines such as Ha Noi – Lang Son, Ha Noi – Lao Cai, etc.

Some important urban areas, industrial centers in the region such as Ha Long, Thai Nguyen, Viet Tri, etc. with diversified industrial structure and key industries have been built. In agriculture, many specialized areas of large-scale and high-yield industrial crops such as tea, sugarcane, peanut, etc. have been established. These areas are the basis for production of agricultural materials pushing the development of the processing industry.

Yet, the generally poor and backward regional infrastructure system in terms of technology, especially in remote areas, has directly affected the development and economic growth of the region over the past years.

SECTION B. RATIONALE AND OBJECTIVES

1. Rationale

1.1. Stakeholder analysis

Table 1 Stakeholder analysis table

Stakeholder group	Characteristics	Problems, needs, interests	Potential benefits	Involvement in the project
Primary stakeholders				
Local people and forest owners at the project target area	- Have land and facilities for forestry activities - Labors involved in forestry activities	- Degraded land - Low productivity of forests - Lack of good seedlings - Lack of intensive forest plantation guideline - Low income from forests	- Increase productivity of forests - Increase income from forests (using high quality of seedlings, applying new technical of intensive planting) - Increase area of plantation forests	- Participate in workshops, training courses - Participate in implementation project and could get great benefits from the activities and results of the Project
Forestry companies	Have land and facilities for forestry activities	- Degraded land - Low productivity of forests - Lack of good seedlings - Lack of intensive forest plantation guideline	- Increase productivity of forests (using high quality of seedlings, applying new technical of intensive planting, also to get good prices after harvesting due to good processing techniques and market created by the Project) - Increase area of plantation forests	Participate in workshops, training courses and implementation project
Forest Science Centre of North-Eastern Viet Nam and research	- Have researchers, equipment needed for research and site	-Inadequate capacity for supply of high-quality seedlings - Lack of	- Strengthen capacity for the production and supply of high-quality	Develop technical guideline and guidelines for workshops and

[Attachment-A]

Stakeholder group	Characteristics	Problems, needs, interests	Potential benefits	Involvement in the project
institutes under Vietnamese Academy of Forest Sciences	for construction of demonstration model - Participate in training and transferring techniques and sciences	finance for supporting activities	seedlings -Having experiences in scientific research and technology transfer	training courses
Secondary stakeholders				
VNFOREST, Department of Agriculture and Rural Development and Forest Protection Department of Vinh Phuc and Quang Ninh provinces	- Lack of updated information on high-quality seedlings - Concern about seedlings and degraded land	- Update database on high-quality seedlings and degraded land - Create link between scientists and local people	- Update sustainable forest protection and management plan - Increase State management capacity on forestry seedlings and forestry land	- Collaborate during the project implementation - Provide and update policy guidelines
Tertiary and other stakeholders				
Wood region market	Involved in timber trading activities	-Incontrollable the price of timber - Insufficient supply of timber products with the quality demanded by the international markets	- Motivate forestry activities in the region - As the focal point for supplying wood to the market	Using timber from project for wood processing
Region Wood processing	Sawmilling and drying facilities	- Lack of wood material for processing - Lack of investment capital; -Low-level sawmilling and drying technology. -Poorly trained personnel	- Motivate forestry activities in the region - Willing to receive and apply new science, technology and equipment	Using wood from project for processing

Stakeholder group	Characteristics	Problems, needs, interests	Potential benefits	Involvement in the project
Local government	- Management of forest activities, motivation for developing forest activities in the region - Responsible for planning and implementing of development plans	- Update database on site condition of the region - Creating relationship between the farmer and scientist - Require technical support to implement regional forest development policies	- Update sustainable forest protection and management plan - Increase State management capacity on forestry seedlings and forestry land - Managing and developing resources	- Provide and update policy guidelines - Cooperating on project implementation

1.2. Problem analysis

Degraded land in combination with traditional cultivation without applying intensive techniques and using selected seedlings have led to low productivity of planted forests. Those are main reasons for poor productivity of planted forests and low production efficiency per a unit of area which still exists in the current forestry production. It is great that the 5 Million Hectare Reforestation Program, which was successfully implemented in Viet Nam, has strongly proven the role of high-quality seedlings to the successful and valuable plantation forests. Improving seedlings is considered as a science technology solution in order to increase productivity and quality of planted forests, contributing to the course of hunger elimination and poverty reduction in upland and mountainous areas as well as reducing the proportion of imported timber in the timber processing industry, thereby increasing the value of Viet Nam's timber processing industry.

The project will help address those constraints by increasing productivity of planted forests through improving seedlings and promoting intensive plantation of *P. caribaea* which is one of imported species suitable for plantation on degraded land in the north of Viet Nam.

The project will focus on 1) silviculture solution to rehabilitate forests on degraded land and 2) using selected seedlings to increase the productivity of planted forests.

[Attachment-A]

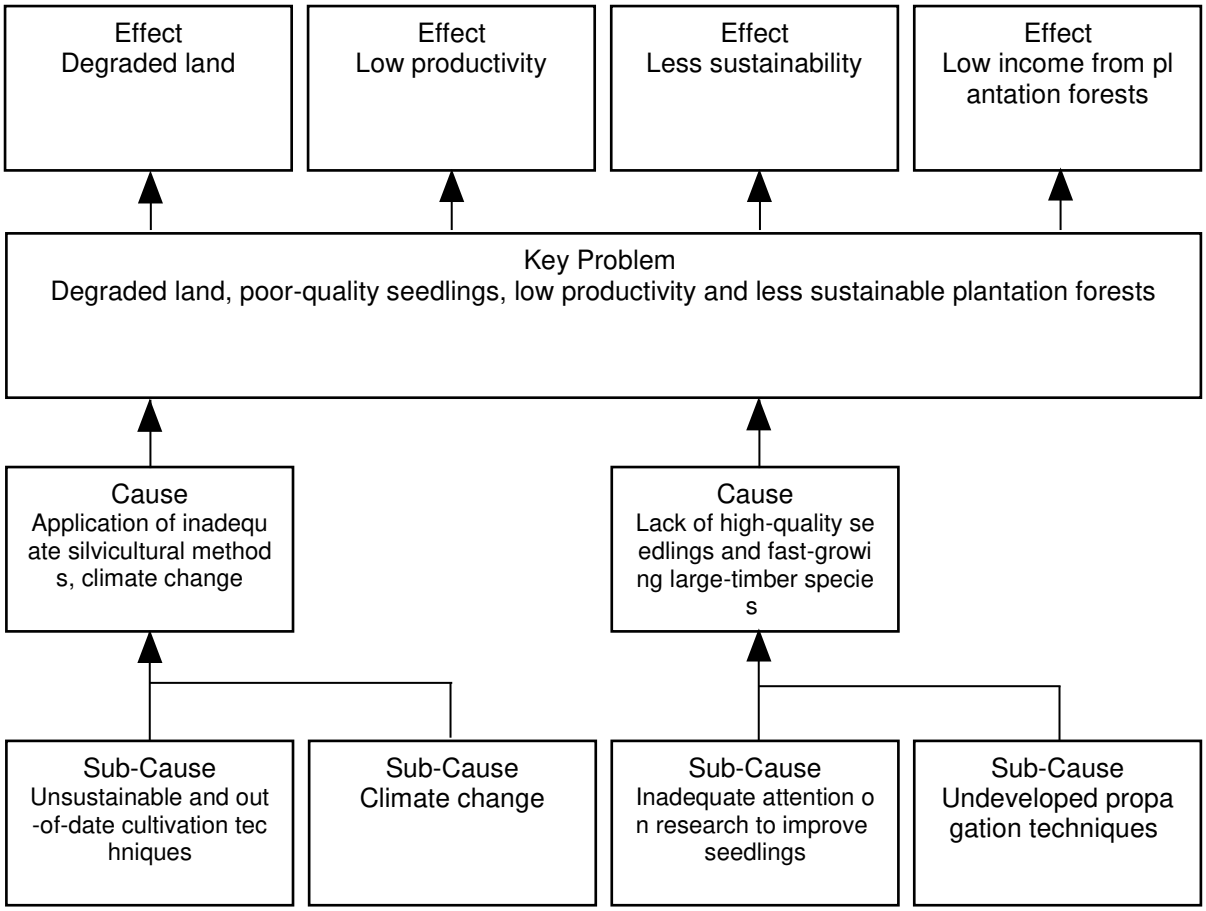

Figure 2. Problem tree

1.3. Logical framework matrix

Table 2. Logical framework matrix

	Narrative	Objectively Verifiable Indicators	Means of Verification	Assumptions
Objective 1	**Improve seedling production capacity**			
Output 1	***Select plus trees and collect seeds (150 plus trees)***			
A.1	Survey and assess the origin, growth, phenology, pests and diseases, and growing techniques of planted forest, seed stand and seed orchard of *P. caribaea*	Report	Surveyed sites are accessible. Surveyed data can be checked and verified (conduct survey in Vinh Phuc, Ha Noi, Son La, Bac Giang, and Quang Ninh…)	Planted forests are not damaged. Forest area is large enough, forests have different ages (5, 10, 15…)
A.2	Select plus trees	150 plus trees	Plus trees ensure their dominance among others inside forest stand; information on plus tree growth and position is described	Selected forest stands are not exploited. Plus trees are well managed and protected.
A.3	Monitor and describe the phenological characteristics, and collect seeds from selected plus trees	Seeds are collected from plus trees	Profile of seed collected from plus trees is described and stored	Plus trees are flowered at the time of collecting
A.4	Store, preserve and assess periodically quality of seeds	Report	Seeds are collected, processed and stored. Data on seed germination is stored	Seeds are properly stored, germination is periodically checked
Output 2	***Establish seed orchards and transformed seed stands (transgenic seedling forest)***			
B.1	Germinate seeds collected from plus trees for experimental plantation	Seed lot	Seeds are separately germinated with different	Seeds are separately stored

[Attachment-A]

	Narrative	Objectively Verifiable Indicators	Means of Verification	Assumptions
			codes	
B.2	Establish seed orchards	04ha/2 orchards	Seed orchard is established at a place where seedlings are likely to flower in accordance with Vietnamese standard (TCVN)	It is necessary to ensure the minimum number of seeds per lot and the number of seedlings per seed lot in accordance with TCVN
B.3	Establish transformed seed stand	10ha	Origin of seedling forest is from good seeds or from mixture of plus trees, transgenic technique is compliant with TCVN	Transgenic stand meets requirements of TCVN
Output 3	***Improve the propagation techniques of P. caribaea by seeds, cuttings and grafting***			
C.1	Improve propagation techniques by seeds	Technical Guideline	The guideline is based on scientific experiments with detailed description of steps and stages of production process which can be replicated and applied into actual production	The guideline is based on full scientific experiments
C.2	Improve propagation techniques by cuttings	Technical Guideline	The guideline is based on scientific experiments with detailed description of steps and stages of production process which can be replicated and applied into actual production	The guideline is based on full scientific experiments
C.3	Improve propagation techniques by grafting	Technical Guideline	The guideline is based on scientific experiments with detailed description of steps and stages of production	The guideline is based on full scientific experiments

	Narrative	Objectively Verifiable Indicators	Means of Verification	Assumptions
			process which can be replicated and applied into actual production	
C.4	Provide training courses on propagation methods for technical staffs	02 training courses for20 technical staffs	Technical staff are able to capture technological processes and apply them into actual production	Technical staff are trained
Output 4	***Conduct communication activities, capacity building and awareness raising on seed production***		***Materials for workshop, trainings are transferred and promoted***	***Participants are able to understand common techniques***
D.1	Training and experience sharing for stakeholders	02 training courses		
Objective 2	**Develop and transfer the guideline of intensive forest plantation for production; develop pilot models from created seedlings**			
Output 5	***Determine suitable sites to plant P. caribaea in the northern mountainous region***			
E.1	Collect available information and data relating to sites to plant *P. caribaea*	Report	Surveyed sites are accessible. Surveyed data can be checked and verified	Planted forests are not damaged. Forest area is large enough
E.2	Survey suitable sites to plant *P. caribaea* (natural conditions, soil, etc.)	Report	Table of natural conditions at the planting sites is prepared Soil samples at surveyed sites are analysed.	Forest area is large enough
E.3	Develop criteria and scale of soil conditions for planting P. caribaea (site map for planting *P. caribaea*)	Report	Site map of *P. caribaea* forest is prepared	Area of plantation forests on different soil types
Output 6	***Develop model forest plantation (with mix and pure plantation) on degraded land, plantation of NTFPs***		***Plantation model must meet requirements of TCVN***	***Model forest must meet requirements of TCVN***

	Narrative	Objectively Verifiable Indicators	Means of Verification	Assumptions
	and native species under forest canopy of P. caribaea			
F.1	Survey to select suitable sites and design plantation models of *P. caribaea*	11ha		
F.2	Develop pure plantation model of *P. caribaea* to provide sawlog	4ha		
F.3	Develop of mixture plantation model	3ha		
F.4	Develop model to plant NTFPs species under forest canopy of *P. caribaea*	2ha		
F.5	Develop model to plant native species under the forest canopy of *P. caribaea*	2ha		
Output 7	***Provide technical training on forest rehabilitation, determination of soil/site conditions for planting P. caribaea***		***Trainees are able to capture technological processes and apply them into actual production***	***Trainees are trained***
G.1	Technical training on determination of soil/site conditions for planting *P. caribaea*	2 training courses		
G.2	Technical training on forest rehabilitation	2 training courses		
Output 8	***Conduct activities of communication, capacity building and awareness raising on intensive forest plantation***		***Materials for workshop, trainings are transferred and promoted***	***Participants are able to understand common techniques***
H.1	Training and experience sharing for stakeholders	2 training courses		
Objective 3	**Develop appropriate techniques to process and preserve and use *P. caribaea* timber to meet the market requirements**			
Output 9	***Survey and access markets of pine***			

[Attachment-A]

	Narrative	Objectively Verifiable Indicators	Means of Verification	Assumptions
	wood and P. caribaea timber inside and outside the country			
I.1	Survey, evaluate the consumption of pine wood and *P. caribaea* timber at the timber processing centers in the north, central and south regions	Report	Surveyed sites are accessible. Surveyed data can be checked and verified	There is source to supply pine wood to the market
I.2	Survey, evaluate markets of *P. caribaea* timber inside and outside the country	Report	Surveyed sites are accessible. Surveyed data can be checked and verified	*P. caribaea* timber is used at these markets
Output 10	***Complete P. caribaea timber preservation techniques***			
J.1	Temporary post-harvesting wood preservation technique	Technical Guideline	The guideline is based on scientific experiments with detailed description of steps and stages of production process which can be replicated and applied into actual production	The guideline is based on full scientific experiments
J.2	Post-sawing timber preservation technique for making woodworking joints	Technical Guideline	The guideline is based on scientific experiments with detailed description of steps and stages of production process which can be replicated and applied into actual production	The guideline is based on full scientific experiments
Output 11	***Develop techniques to produce P. caribaea finger joint boards***			
K.1	Develop technique to produce *P. caribaea* finger joint boards	Technical Guideline	The guideline is based on scientific experiments with detailed description of steps and stages of production process which can be	The guideline is based on full scientific experiments

[Attachment-A]

	Narrative	Objectively Verifiable Indicators	Means of Verification	Assumptions
			replicated and applied into actual production	
K.2	Develop technique to produce *P. caribaea* thin wood/veneer	Technical Guideline	The guideline is based on scientific experiments with detailed description of steps and stages of production process which can be replicated and applied into actual production	The guideline is based on full scientific experiments
Output 12	***Conduct activities of communication, capacity building, awareness raising on preservation and processing of post-harvesting P. caribaea timber***		***Materials for workshop, trainings are transferred and promoted***	***Participants are able to understand common techniques***
L.1	Training and experience sharing for stakeholders	2 training courses		
Goal	**Develop *P. caribaea* forests on degraded land in northern mountainous region by improving high-quality seedling production, developing intensive cultivation techniques and appropriate *P. caribaea* timber processing and preservation technology to meet market demands and provide raw materials for timber processing industry**			

1.4. Justification

For degraded land, *P. caribaea* is a top priority because this species has been researched and experimentally planted on different soil types in the northern mountainous region. It is also well developed in places where have difficult conditions.

In order to improve the productivity of planted forests, selection of appropriate seedlings and application of advanced silvicultural techniques are feasible and necessary scientific solutions. Good seedlings will bring highly effective plantation forests and application of advanced silvicultural techniques will shorten business cycle and increase the productivity of planted forests.

The project will increase the capacity of high-quality seedling production and supply, new cultivation methods to be introduced and transferred will be effective tools and solutions to degraded land.

Main contents of the project will be addressed via field activities and by experienced research staff. Through trainings on seedling creation in combination with modern infrastructures and facilities, forest plantation will be provided with high-quality sources. The project results will be transferred to beneficiaries through trainings and workshops.

2. Objectives

2.1. Main objective (development objective)

To develop *P. caribaea* forests on degraded land in northern mountainous region by improving high-quality seedling production, developing intensive cultivation techniques and appropriate *P. caribaea* timber processing and preservation technology to meet market demands and provide raw materials for timber processing industry.

2.2. Specific objectives and success criteria & indicators

1) To improve high-quality *P. caribaea* seedling production by selection of at least 150 plus trees from seed orchards; development of 10ha of transformed seed stands and 4ha of seed orchards; completion of sexual and asexual propagation techniques to create high-quality seedlings and transfer them to production.
2) To develop and transfer the guideline of intensive forest plantation to production; develop 11ha of model forest from created seedlings.
3) To develop appropriate techniques to preserve *P. caribaea* timber to meet market demands.

[Attachment-A]

SECTION C. DESCRIPTION OF PROJECT INTERVENTIONS

1. Work Plan and Schedule

Outputs	Performance Indicator	Responsible Person/ Body	Annual Timeline																Remark
			2020				2021				2022				2023				
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Objective 1. Improve seedling production capacity																			
Output 1. Selection of plus trees and collection of seeds																			
A.1. Survey and assess the origin, growth, phenology, pests and diseases, and growing techniques of planted forest, seed stand and seed orchard of P. caribaea	*Report*	*FSNE*																	
A.2. Select plus trees	*150 plus trees*	*FSNE*																	
A.3. Monitor and describe the phenological characteristics and collect seeds from selected plus trees	*Report*	*FSNE*																	
A.4. Store, preserve and assess periodically quality of seeds	*Report*	*FSNE/ FTIBRI*																	
Output 2. Establishment of seed orchard and transformed seed stand																			
B.1. Germinate seeds collected from plus trees for experimental plantation	*Seed lot*	*FSNE*																	
B.2. Establish seed orchards	*04 ha*	*FSNE/ FTIBRI*																	
B.3. Establish transformed seed stand	*10 ha*	*FSNE*																	

[Attachment-A]

Outputs	Performance Indicator	Responsible Person/ Body	Annual Timeline																Remark
			2020				2021				2022				2023				
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Output 3. Improve the propagation techniques of P. caribaea by seeds, cuttings and grafting																			
C.1. Improve propagation techniques by seeds	*Technical Guideline*	*FSNE*																	
C.2. Improve propagation techniques by cuttings	*Technical Guideline*	*FSNE/ FTIBRI*																	
C.3. Improve propagation techniques by grafting	*Technical Guideline*	*FSNE/ FTIBRI*																	
C.4. Provide training courses on propagation methods for technical staffs	*2 courses for 10 technical staffs each*	*FSNE/ FTIBRI*																	
Output 4. Conduct activities of communication, capacity building and awareness raising on seed production																			
D.1. Training and experience sharing for stakeholders	*2 courses for 20 technical staffs each*	*FSNE/ FTIBRI*																	
Objective 2. Develop and transfer the guideline of intensive forest plantation for production; develop pilot models from created seedlings																			
Output 5. Determine suitable sites to plant *P. caribaea* in the northern mountainous region																			
E.1. Collect available information and data relating to sites to plant P. caribaea	*Report*	*FSNE*																	
E.2. Survey suitable sites to plant P. caribaea	*Report*	*FSNE*																	
E.3. Develop criteria and scale of site conditions for planting P. caribaea	*Report*	*FSNE*																	

[Attachment-A]

Outputs	Performance Indicator	Responsible Person/ Body	Annual Timeline																Remark
			2020				2021				2022				2023				
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Output 6. Develop model forest plantation (with mix and pure plantation) on degraded land, plantation of NTFPs and native species under forest canopy of *P. caribaea*																			
F.1. Survey to select suitable sites and design plantation models of P. caribaea	*Report*	*FSNE*																	
F.2. Develop pure plantation model of P. caribaea to provide sawlog	*04 ha*	*FSNE*																	
F.3. Develop of mix plantation model	*03 ha*	*FSNE*																	
F.4. Develop model to plant NTFPs under forest canopy of P. caribaea	*02 ha*	*FSNE*																	
F.5. Develop model to plant native species under the forest canopy of P. caribaea	*02 ha*	*FSNE*																	
Output 7. Provide technical training on forest rehabilitation, determination of soil/site conditions for planting *P. caribaea*																			
G.1. Technical training on determination of soil/site conditions for planting P. caribaea	*2 courses for 20 technical staffs each*	*FSNE*																	
G.2. Technical training on forest rehabilitation	*2 courses for 20 technical staffs each*	*FSNE*																	
Output 8. Conduct activities of communication, capacity building and awareness raising on intensive forest plantation																			
H.1. Training and experience	*2 courses*	*FSNE*																	

[Attachment-A]

Outputs	Performance Indicator	Responsible Person/ Body	Annual Timeline																Remark
			2020				2021				2022				2023				
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
sharing for stakeholders	*for 20 technical staffs each*																		
Objective 3. Develop appropriate techniques to process and preserve P. caribaea timber to meet the market requirements																			
Output 9. Survey and assess markets of pine wood and *P. caribaea* timber inside and outside the country																			
I.1. Survey, evaluate the consumption of pine wood and P. caribaea timber at the timber processing centers in the north, central and south regions	*Report*	*FIRI**																	
I.2. Survey, evaluate markets of P. caribaea timber inside and outside the country	*Report*	*FIRI*																	
Output 10. Complete P. caribaea timber preservation techniques																			
J.1. Temporary post-harvesting wood preservation technique	*Technical Guideline*	*FIRI*																	
J.2. Post-sawing timber preservation techniques for making woodworking joints	*Technical Guideline*	*FIRI*																	
Output 11. Develop techniques to produce P. caribaea wood finger joint boards																			
K.1. Develop technique to produce P. caribaea finger joint boards	*Technical Guideline*	*FIRI*																	
K.2. Develop technique to produce P. caribaea thin wood/veneer	*Technical Guideline*	*FIRI*																	
Output 12. Conduct activities of communication, capacity building, awareness raising on preservation and processing of post-harvesting P. caribaea timber																			

[Attachment-A]

Outputs	Performance Indicator	Responsible Person/ Body	Annual Timeline																Remark
			2020				2021				2022				2023				
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
L.1. Training and experience sharing for stakeholders	*2 courses for 20 technical staffs each*	*FIRI/ FSNE*																	
II. SUPPORT ACTIVIES																			
1. Inception meeting, mid-term and final workshops	*3 workshops*	*FSNE*																	
2. Expenses for staff attending training courses abroad	*2 staffs*	*FSNE*																	
3. Hire contract staff to assist the PMU	*1 contract staff*	*FSNE*																	
4. Contingency cost		*FSNE*																	

**** Note:*** *FSNE - Forest Science Centre of North-Eastern, VAFS*

FTIBRI - Forest Tree Improvement and Biotechnology Research Institute, VAFS

FIRI - Forest Industry Research Institute, VAFS

[Attachment-A]

2. Budget (USD)

2.1 AFoCO Funding

Activity	Unit	Unit cost	Qty	Total (USD)	Budget allocation by year (USD)				Remark
					2020	2021	2022	2023	
Objective 1. Improve seedling production capacity				**229.803**	**91.911**	**73.920**	**41.796**	**22.176**	.
Output 1. Selection of plus trees and collection of seeds (expected 150 plus trees)				**58.531**	**35.091**	**16.950**	**6.490**	**-**	
A.1. Survey and assess the origin, growth, phenology, pests and diseases, and growing techniques of planted forest, seed stand and seed orchard of P. caribaea				***19.011***	***19.011***	**-**	**-**	**-**	*This activity aimed to complete within 1st year of project. The total budget is increased by USD 5.011 caused by increasing basic salary for technical and unskilled worker*
A.1.1. Survey and assess the origin, growth, phenology, pests and diseases, and growing techniques of P. caribaea forest (expected survey in 5 provinces: Vinh Phuc, Ha Noi, Son La, Bac Giang, and Quang Ninh)				*12.056*	*12.056*	-	-	-	
- Domestic consultant (25 days for field + 4 days for report writing)	man-day	150	29	4.350	4.350				
- DSA for consultant (5 days per province x 5 provinces)	day	35	25	875	875				

[Attachment-A]

Activity	Unit	Unit cost	Qty	Total (USD)	Budget allocation by year (USD)				Remark
					2020	2021	2022	2023	
- Lodging for consultant (24 nights in 5 provinces)	night	30	24	720	720				
- DSA for staff (5 days per province x 5 provinces x 2 people)	day	35	50	1.750	1.750				
- Lodging for staff (19 nights x 2 people in 4 provinces: Ha Noi, Son La, Bac Giang and Quang Ninh)	night	30	38	1.140	1.140				
- Hire local people to assist in the field (5 man-day/province x 5 provinces)	man-day	40	25	1.000	1.000				
- Car hiring (20 days for survey in 4 provinces: Ha Noi, Son La, Bac Giang, and Quang Ninh)	day	110	20	2.200	2.200				
- Printing, photocopy, etc.	lump-sum			21	21				
A.1.2. Survey and assess the origin, growth, phenology, pests and diseases, and techniques to build seed stand and seed orchard of P. caribaea (expected survey in: Ba Vi, Tam Dao, and Phuc Yen)				*6.955*	*6.955*	-	-	-	*This activity is in line with A.1.1 since these two activities should go simultaneously.*
- Domestic consultant (15 days for field + 3 days for report writing)	man-day	150	18	2.700	2.700				
- DSA for consultant (5 days per site x 3 sites)	day	35	15	525	525				
- Lodging for consultant (14 nights in 3 sites)	night	30	14	420	420				
- DSA for staff (5 days per site x 3 sites x 2 people)	day	35	30	1.050	1.050				

[Attachment-A]

Activity	Unit	Unit cost	Qty	Total (USD)	Budget allocation by year (USD)				Remark
					2020	2021	2022	2023	
- Lodging for staff (9 nights for 2 sites (Ba Vi and Tam Dao) x 2 people)	night	30	18	540	540				
- Hire local people to assist in the field (5 man-day/site x 3 sites)	man-day	40	15	600	600				
- Car hiring (10 days for survey in 2 sites: Ba Vi and Tam Dao)	day	110	10	1.100	1.100				
- Printing, photocopy, etc.	lump-sum			20	20				
A.2. Select plus trees (in 3 sites: Ba Vi, Tam Dao and Phuc Yen)				***5.620***	***5.620***	***-***	***-***	***-***	*The total budget is decreased by USD 380. However, the target remains the same.*
- Domestic consultant (12 days for field + 3 days for report writing)	man-day	150	15	2.250	2.250				
- DSA for consultant (4 days per site x 3 sites)	day	35	12	420	420				
- Lodging for consultant (11 night in 3 sites)	night	30	11	330	330				
- DSA for staff (4 days per site x 3 sites x 2 people)	day	35	24	840	840				
- Lodging for staff (7 nights x 2 people in 2 sites: Ba Vi and Tam Dao)	night	30	14	420	420				
- Hire local people to assist in the field (4 man-day/site x 3 sites)	man-day	40	12	480	480				

[Attachment-A]

Activity	Unit	Unit cost	Qty	Total (USD)	Budget allocation by year (USD)				Remark
					2020	2021	2022	2023	
- Car hiring (8 days for survey in Ba Vi and Tam Dao)	day	110	8	880	880				
A.3. Monitor and describe the phenological characteristics and collect seeds from selected plus trees (in 3 sites: Ba Vi, Tam Dao and Phuc Yen)				***25.500***	***9.410***	***12.750***	***3.340***	***-***	*The total budget of this activity is increased by USD 5.500 caused by more surveying site were selected in order to ensure the outwardness. However, the target remains the same.*
A.3.1. Monitor and describe phenological characteristics of plus trees (every 2 months for the first 24 months; total 12 times: 2 in 2020 + 6 times in 2021 + 4 times in 2022)				*10.020*	*1.670*	*5.010*	*3.340*	-	
- Domestic consultant (for monitoring and describing phenological characteristics of plus trees) (3 man-day/time x 12 times)	man-day	150	36	5.400	900	2.700	1.800		
- DSA for consultant (3 days per time x 12 times)	day	35	36	1.260	210	630	420		
- Lodging for consultant (2 nights per time x 12 times)	night	30	24	720	120	360	240		
- Car hiring (2 days per time x 12 times for 2 sites (Ba Vi and Tam Dao))	day	110	24	2.640	440	1.320	880		
A.3.2. Collect seeds from selected plus trees (2 years:				*15.480*	*7.740*	*7.740*	-	-	

[Attachment-A]

Activity	Unit	Unit cost	Qty	Total (USD)	Budget allocation by year (USD)				Remark
					2020	2021	2022	2023	
2020-2021)									
- Domestic consultant (for implementation of fruit collection and fruit processing, seed cleaning) (15 man-day/year (12 days for field + 3 days for report writing) x 2 years)	man-day	150	30	4.500	2.250	2.250			
- DSA for consultant (4 days per site x 3 sites x 2 years)	day	35	24	840	420	420			
- Lodging for consultant (11 night per year x 2 years)	night	30	22	660	330	330			
- DSA for staff (4 days per site x 3 sites x 2 years x 2 people)	day	35	48	1.680	840	840			
- Lodging for staff (7 nights per year x 2 years x 2 staffs in 2 sites: Ba Vi and Tam Dao)	night	30	28	840	420	420			
- Hire local people to climb and collect fruits from plus trees (50 man-day/year x 2 years)	man-day	40	100	4.000	2.000	2.000			
- Hire local people to separate and clean seeds (15 man-day/year x 2 years)	man-day	40	30	1.200	600	600			
- Car hiring (8 days per year x 2 years)	day	110	16	1.760	880	880			
A.4. Store, preserve and assess periodically quality of seeds (every 3 months for the first 24 months; 8 times (1 times in 2020 + 4 times in 2021 + 3 times in 2022))				***8.400***	***1.050***	***4.200***	***3.150***	***-***	*The total budget decreased by USD 1.600 caused by implementing unit has self-allocated their salary for personnel*

[Attachment-A]

Activity	Unit	Unit cost	Qty	Total (USD)	Budget allocation by year (USD)				Remark
					2020	2021	2022	2023	
									However, the target remains the same.
- Domestic consultant for monitoring and assessing seed quality during storage, analysing data and writing report) (7 man-day/time x 8 times)	man-day	150	56	8.400	1.050	4.200	3.150		
Output 2. Establishment of seed orchard and transformed seed stand				**134.922**	**40.650**	**41.550**	**32.626**	**20.096**	
B.1. Germinate seeds collected from plus trees for establishment of models				***6.600***	***3.350***	***3.250***	**-**	**-**	*The total budget is increased by USD 600 caused by increasing salary unit cost. However the target is the same.*
- Hire local people to prepare nurseries, sow seeds and tend seedlings, etc. (80 man-day/year x 2 years)	man-day	40	160	6.400	3.200	3.200			
- Materials, tools (soil, potting bags, fertilizers, etc.)	lump-sum			200	150	50			
B.2. Establish seed orchards				***57.872***	***3.640***	***29.980***	***15.596***	***8.656***	*The total budget is decreased by USD 22.128 caused the survey and*

Activity	Unit	Unit cost	Qty	Total (USD)	Budget allocation by year (USD)				Remark
					2020	2021	2022	2023	
									designing is reduced to 3rd 4th year. However the target is the same.
B.2.1. Survey for selecting sites and designing seed orchards (expected 4 ha in 2 provinces: Vinh Phuc and Quang Ninh)				*3.640*	*3.640*	-	-	-	*The total budget is within 1st year. However the survey and designing could be started sooner to be ready for plantation of 2nd year and 3rd year.*
- Domestic consultant (8 days for field + 3 days for report writing)	man-day	150	11	1.650	1.650				
- DSA for consultant (4 days per province x 2 provinces)	day	35	8	280	280				
- Lodging for consultant (7 nights in 2 provinces)	night	30	7	210	210				
- DSA for staff (4 days per province x 2 people x 2 provinces)	day	35	16	560	560				
- Lodging for staff (3 nights x 2 people in Quang Ninh)	night	30	6	180	180				
- Hire local people to assist in the field (4 man-	man-day	40	8	320	320				

[Attachment-A]

Activity	Unit	Unit cost	Qty	Total (USD)	Budget allocation by year (USD)				Remark
					2020	2021	2022	2023	
day/province x 2 provinces)									
- Car hiring (4 days for survey in Quang Ninh)	day	110	4	440	440				
B.2.2. Establish seed orchard (planting in 2021; planting density1650 trees per ha)				*23.040*	-	*23.040*	-	-	*This activity is within 2nd year caused by the project start is 3rd quarter of 2020. However the target is the same*
- Domestic consultant (8 days per province x 2 provinces)	man-day	150	16	2.400		2.400			
- DSA for consultant (8 days per province x 2 provinces)	day	35	16	560		560			
- Lodging for consultant (15 nights in 2 provinces)	night	30	15	450		450			
- DSA for staff (8 days per province x 2 people x 2 provinces)	day	35	32	1.120		1.120			
- Lodging for staff (7 nights x 2 people in Quang Ninh)	night	30	14	420		420			
- Hire local people for clearing vegetation, digging holes, fertilizing, planting trees, etc. (70 man-day/ha x 4 ha)	man-day	40	280	11.200		11.200			
- Car hiring (8 days to Quang Ninh)	day	110	8	880		880			
- NPK fertilizer (including the transporation) (0.5 kg/tree x 1650 tree/ha x 4 ha)	kg	0,6	3.300	1.980		1.980			
- Microbiological fertilizer (including transporation) (2	kg	0,3	13.200	3.960		3.960			

Activity	Unit	Unit cost	Qty	Total (USD)	Budget allocation by year (USD)				Remark
					2020	2021	2022	2023	
kg/tree x 1650 tree/ha x 4 ha)									
- Materials, tools, etc.	lump-sum			70		70			
B.2.3. Model tending (4 times: 1 in 2021 + 2 in 2022 + 1 time in 2023)				*23.232*	-	*4.950*	*11.616*	*6.666*	*This activity is reduced to 2nd year caused by plantation activity schedule. However the target is the same*
- Domestic consultant (for monitoring tending) (8 man-day/time x 4 times)	man-day	150	32	4.800		1.200	2.400	1.200	
- DSA for consultant (8 days per time x 4 times)	day	35	32	1.120		280	560	280	
- Lodging for consultant (7 nights per time x 4 times)	night	30	28	840		210	420	210	
- DSA for staff (4 days per time x 4 times x 2 people x 2 provinces)	day	35	64	2.240		560	1.120	560	
- Lodging for staff (3 nights per time x 4 times x 2 people in Quang Ninh)	night	30	24	720		180	360	180	
- Hire local people to clear weeds, vines, and shrubs; and to hoe and hill up trees (10 man-day/ha x 4 ha x 4 times)	man-day	40	160	6.400		1.600	3.200	1.600	
- Hire local people to re-plant the failures (3 man-day/ha x 4 ha x 2 times: 2021 and 2022)	man-day	40	24	960		480	480		

[Attachment-A]

Activity	Unit	Unit cost	Qty	Total (USD)	Budget allocation by year (USD)				Remark
					2020	2021	2022	2023	
- Hire local people for fertilizing (3 man-day/ha x 4 ha x 2 times: 2022 and 2023)	man-day	40	24	960			480	480	
- Car hiring (4 days per time x 4 times to Quang Ninh)	day	110	16	1.760		440	880	440	
- NPK fertilizer (including the transporation) (0.3 kg/tree x 1650 tree/ha x 4ha x 2 years: 2022 and 2023)	kg	0,6	3.960	2.376			1.188	1.188	
- Supe phosphate fertilizer (including transporation) (0,2 kg/tree x 1650 tree/ha x 4ha x 2 years: 2022 and 2023)	kg	0,4	2.640	1.056			528	528	
B.2.4. Data collection and analysis (4 times: 1 in 2021 + 2 in 2022 + 1 time in 2023)				*7.960*	-	*1.990*	*3.980*	*1.990*	*This activity is in line with B.2.3 since these two activities should go simultaneously caused by the growth and pets information needs to be collected for analysing*
- Domestic consultant for field data collection, data analysis and report writing (8 man-days per time (4 days for field + 4 days for report writing) x 4 times)	man-day	150	32	4.800		1.200	2.400	1.200	
- DSA for consultant (4 days per time x 4 times)	day	*35*	16	560		140	280	140	
- Lodging for consultant (3 nights per time x 4 times)	night	*30*	12	360		90	180	90	

[Attachment-A]

Activity	Unit	Unit cost	Qty	Total (USD)	Budget allocation by year (USD)				Remark
					2020	2021	2022	2023	
- DSA for staff (2 days per time x 4 times x 2 people x 2 provinces)	day	*35*	32	1.120		280	560	280	
- Lodging for staff (1 night per time x 4 times x 2 people in Quang Ninh)	night	*30*	8	240		60	120	60	
- Car hiring (2 days per time x 4 times to Quang Ninh)	day	110	8	880		220	440	220	
B.3. Establish transformed seed stand				**70.450**	**33.660**	**8.320**	**17.030**	**11.440**	*The total budget is increased by USD 45.450 caused by the tending, fertilizer, and data collection are added in order to ensure objective. However the target is the same.*
B.3.1. Survey to select sites and design the transformed seed stands (expect 10ha in 2 sites: Tam Dao and Phuc Yen)				*4.580*	*4.580*	-	-	-	
- Domestic consultant (for surveying and designing seed stands) (10 man-day for field + 4 man-day for report writing)	man-day	150	14	2.100	2.100				
- DSA for consultant (5 days per site x 2 sites)	day	35	10	350	350				

[Attachment-A]

Activity	Unit	Unit cost	Qty	Total (USD)	Budget allocation by year (USD)				Remark
					2020	2021	2022	2023	
- Lodging for consultant (4 nights per site x 2 sites)	night	30	8	240	240				
- DSA for staff (5 days x 2 people x 2 sites)	day	35	20	700	700				
- Lodging for staff (4 nights x 2 people in Tam Dao)	night	30	8	240	240				
- Hire local people to assist in the field (5 man-day/site x 2 sites)	man-day	40	10	400	400				
- Car hiring (5 days for survey in Tam Dao)	day	110	5	550	550				
B.3.2. Selecting breeding trees and thinning (remained breeding density is 800 tree/ha)				*29.080*	*29.080*	-	-	-	
- Domestic consultant (for selection and marking felled trees) (10 days for field + 2 days for report writing)	man-day	150	12	1.800	1.800				
- DSA for consultant (5 days per site x 2 sites)	day	35	10	350	350				
- Lodging for consultant (4 nights x 2 sites)	night	30	8	240	240				
- DSA for staff (5 days x 2 people x 2 sites)	night	35	20	700	700				
- Lodging for staff (4 nights x 2 people in Tam Dao)	night	30	8	240	240				
- Hire local people for thinning and transporting felled trees out of the forest (30 man-day/ha x 10ha)	man-day	40	300	12.000	12.000				
- Hire local people for clearing vegetation, sanitizing forests, fertilizing and tending (20 man-day/ha x 10ha)	man-day	40	200	8.000	8.000				
- Car hiring (5 days to Tam Dao)	day	110	5	550	550				
- NPK fertilizer (including the transporation) (0.5 kg/tree x 800 tree/ha x 10 ha)	kg	0,6	4.000	2.400	2.400				

[Attachment-A]

Activity	Unit	Unit cost	Qty	Total (USD)	Budget allocation by year (USD)				Remark
					2020	2021	2022	2023	
- Microbiological fertilizer (including transporation) (0.5 kg/tree x 800 tree/ha x 10 ha)	kg	0,3	4.000	1.200	1.200				
- Supe phosphate fertilizer (including transporation) (0.5 kg/tree x 800 tree/ha x 10 ha)	kg	0,4	4.000	1.600	1.600				
B.3.3. Model tending (4 times: 1 in 2021 + 2 in 2022 + 1 time in 2023)				*28.600*	-	*5.590*	*14.300*	*8.710*	
- Domestic consultant (6 man-day/time x 4 times)	man-day	150	24	3.600		900	1.800	900	
- DSA for consultant (6 days per time x 4 times)	day	35	24	840		210	420	210	
- Lodging for consultant (5 nights per time x 4 times)	night	30	20	600		150	300	150	
- Hire local people for clearing weeds and fertilizing (10 man-day/ha x 10ha x 4 times)	man-day	40	400	16.000		4.000	8.000	4.000	
- Car hiring (3 days per time x 4 times to Tam Dao)	day	110	12	1.320		330	660	330	
- NPK fertilizer (including the transporation) (0.3 kg/tree x 800 tree/ha x 10 ha x 2 years (2022-2023))	kg	0,6	4.800	2.880			1.440	1.440	
- Microbiological fertilizer (including transporation) (0.3 kg/tree x 800 tree/ha x 10 ha x 2 years (2022-2023))	kg	0,3	4.800	1.440			720	720	
- Supe phosphate fertilizer (including transporation) (0.3 kg/tree x 800 tree/ha x 10 ha x 2 years (2022-2023))	kg	0,4	4.800	1.920			960	960	
B.3.4. Data collection and analysis (1 time per year x 3 years (2021-2023))				*8.190*	-	*2.730*	*2.730*	*2.730*	
- Domestic consultant for field data collection, data analysis and report writing (10 man-days per time (6 days for field + 4 days for report writing) x 3 times)	man-day	150	30	4.500		1.500	1.500	1.500	

[Attachment-A]

Activity	Unit	Unit cost	Qty	Total (USD)	Budget allocation by year (USD)				Remark
					2020	2021	2022	2023	
- DSA for consultant (3 days per site x 2 sites x 3 times)	day	35	18	630		210	210	210	
- Lodging for consultant (5 nights per time in 2 sites x 3 times)	night	30	15	450		150	150	150	
- DSA for staff (3 days per site x 2 sites x 3 times x 2 people)	day	35	36	1.260		420	420	420	
- Lodging for staff (2 nights per time in Tam Dao x 2 people x 3 times)	night	30	12	360		120	120	120	
- Car hiring (3 days per time x 3 times to Tam Dao)	day	110	9	990		330	330	330	
Output 3. Improve the propagation techniques of P. *caribaea* by seeds, cuttings and grafting				**31.590**	**16.170**	**15.420**	**-**	**-**	
C.1. Improve propagation techniques by seeds				***6.450***	***3.225***	***3.225***	**-**	**-**	*The total budget is increased by USD 2.450 caused by added experiments and increasing technical's salary unit cost. However the target is the same.*
Domestic consultant (arrange experiment, monitoring, data collection and analysis, write technical guideline), (8 days for field + 2 days for report writing)	man-day	150	20	3.000	1.500	1.500			

[Attachment-A]

Activity	Unit	Unit cost	Qty	Total (USD)	Budget allocation by year (USD)				Remark
					2020	2021	2022	2023	
- DSA for consultant (8 days per year x 2 years)	day	35	16	560	280	280			
- Lodging for consultant (7 nights per year x 2 years)	night	30	14	420	210	210			
- Hire local people to prepare nurseries, plant and tend seedlings, etc. (30 man-day/year x 2 years)	man-day	40	60	2.400	1.200	1.200			
- Materials, tools (soil, fertilizer, etc.)	lump-sum			70	35	35			
C.2. Improve propagation techniques by cuttings				***9.180***	***4.590***	***4.590***	**-**	**-**	*The total budget is reduced by USD 4.820 caused by decreasing budget for travel and allowances for staff. However the target is the same.*
Domestic consultant (arrange experiment, monitoring, data collection and analysis, write technical guideline), (8 days for field + 2 days for report writing)	man-day	150	20	3.000	1.500	1.500			
- DSA for consultant (8 days per year x 2 years)	day	35	16	560	280	280			
- Lodging for consultant (7 nights per year x 2 years)	night	30	14	420	210	210			
- Hire local people to prepare nurseries, take cuttings from the plus trees and tend seedlings, etc. (20 man-	man-day	40	40	1.600	800	800			

[Attachment-A]

Activity	Unit	Unit cost	Qty	Total (USD)	Budget allocation by year (USD)				Remark
					2020	2021	2022	2023	
day/year x 2 years)									
- Hire local people for nursery preparation, cuttings, tending, etc. (30 man-day/year x 2 years)	man-day	40	60	2.400	1.200	1.200			
- Car hiring (5 days per year x 2 years)	day	110	10	1.100	550	550			
- Materials, tools (soil, fertilizer, etc.)	lump-sum			100	50	50			
C.3. Improve propagation techniques by grafting				***9.200***	***4.600***	***4.600***	***-***	***-***	*The total budget is increased by USD 3.200 caused by added site for materials collection.*
Domestic consultant (arrange experiment, monitoring, data collection and analysis, write technical guideline), (8 days for field + 2 days for report writing)	man-day	150	20	3.000	1.500	1.500			
- DSA for consultant (8 days per year x 2 years)	day	35	16	560	280	280			
- Lodging for consultant (7 nights per year x 2 years)	night	30	14	420	210	210			
- Hire local people to prepare nurseries, take cuttings from the plus trees and tend seedlings, etc. (20 man-day/year x 2 years)	man-day	40	40	1.600	800	800			
- Technical staff for grafting (30 man-day/year x 2 years)	man-day	40	60	2.400	1.200	1.200			
- Car hiring (5 days per year x 2 years)	day	110	10	1.100	550	550			

Activity	Unit	Unit cost	Qty	Total (USD)	Budget allocation by year (USD)				Remark
					2020	2021	2022	2023	
- Materials, tools (soil, fertilizer, etc.)	lump-sum			120	60	60			
C.4. Provide training courses on propagation methods for technical staffs (2 courses; 10 persons per course; 5 days per course (2 days for theory and 3 days for practice))				***6.760***	***3.755***	***3.005***	***-***	***-***	*The total budget is reduced by USD 13.240 caused by the allowances are considered as no using AFoCO's grant. However the target is the same.*
- Domestic consultant (prepare for training materials) (5 man-day)	man-day	150	5	750	750				
- Domestic consultant (5 man-day/course x 2 courses)	man-day	150	10	1.500	750	750			
- DSA for consultant (5 days per course x 2 courses)	day	35	10	350	175	175			
- Lodging for consultant (4 nights per course x 2 courses)	night	30	8	240	120	120			
- DSA for participants (5 days per course x 2 courses x 10 persons per course)	day	35	100	3.500	1.750	1.750			
- DSA for staff to organize trainings (2 staffs x 6 days per staff)	day	35	12	420	210	210			
Output 4. Conduct activities of communication, capacity building and awareness raising on seed				**4.760**	**-**	**-**	**2.680**	**2.080**	

[Attachment-A]

Activity	Unit	Unit cost	Qty	Total (USD)	Budget allocation by year (USD)				Remark
					2020	2021	2022	2023	
production									
D.1. Training and experience sharing for stakeholders (2 training courses x 2 days per course x 20 persons per course)									*The total budget is increased by USD 760 caused by DSA for technical staff is raised.*
- Domestic consultant (prepare for training materials) (4 man-day)	man-day	150	4	600			600	-	
- Domestic consultant (training) (2 days per course x 2 courses)	man-day	150	4	600			300	300	
- DSA for consultant (2 days per course x 2 courses)	day	35	4	140			70	70	
- Lodging for consultant (1 night per course x 2 courses)	night	30	2	60			30	30	
- DSA for participants (2 days per course x 2 courses x 20 persons per course)	day	35	80	2.800			1.400	1.400	
- DSA for staff to organize trainings (2 people x 3 man-days per course x 2 courses)	man-day	35	12	420			210	210	
- Copying, stationery, drinking water, etc.	lump-sum			140			70	70	
Objective 2. Develop and transfer the guideline of intensive forest plantation for production; develop pilot models from created seedlings				**154.777**	**18.090**	**69.323**	**43.567**	**23.797**	
Output 5. Determine suitable sites to plant *P. caribaea* in the northern mountainous region				**14.080**	**14.080**	**-**	**-**	**-**	

[Attachment-A]

Activity	Unit	Unit cost	Qty	Total (USD)	Budget allocation by year (USD)				Remark
					2020	2021	2022	2023	
E.1. Collect available information and data relating to sites to plant P. caribaea				***1.200***	***1.200***	***-***	***-***	***-***	*The total budget is reduced by USD 3.800 caused by the allowances are considered as no using AFoCO's grant. However the target is the same.*
- Domestic consultant	man-day	150	8	1.200	1.200				
E.2. Survey suitable sites to plant P. caribaea (expect 5 provinces: Vinh Phuc, Ha Noi, Son La, Bac Giang and Quang Ninh)				***9.880***	***9.880***	***-***	***-***	***-***	*The total budget is increased by USD 4.880 caused by DSA for technical staff and number of survey site are raised.*
- Domestic consultant (20 days for field + 5 days for report writing)	man-day	150	25	3.750	3.750				
- DSA for consultant (4 days per province x 5 provinces)	day	35	20	700	700				
- Lodging for consultant (19 nights in 5 provinces)	night	30	19	570	570				

[Attachment-A]

Activity	Unit	Unit cost	Qty	Total (USD)	Budget allocation by year (USD)				Remark
					2020	2021	2022	2023	
- DSA for staff (4 days per province x 5 provinces x 2 people)	day	35	40	1.400	1.400				
- Lodging for staff (15 nights x 2 people)	night	30	30	900	900				
- Hire local people to assist in the field (4 man-day/province x 5 provinces)	man-day	40	20	800	800				
- Car hiring (4 days per province x 4 provinces)	day	110	16	1.760	1.760				
E.3. Develop criteria and scale of site conditions for planting P. caribaea				***3.000***	***3.000***	**-**	**-**	**-**	*The total budget is reduced by USD 7.000 caused by the allowances are considered as no using AFoCO's grant. However the target is the same.*
- Domestic consultants (developing criteria and scale of site conditions - site map for planting P. caribaea)	man-day	150	20	3.000	3.000				
Output 6. Develop model forest plantation (with mix and pure plantation) on degraded land, plantation of NTFPs and native species under forest canopy of P. *caribaea*				**126.517**	**4.010**	**59.803**	**40.937**	**21.767**	
F.1. Survey to select suitable sites and design plantation models of P. caribaea (11 ha of models: 4 ha of pure plantation of P. caribaea; 3 ha of mixture plantation; 2				***4.010***	***4.010***	**-**	**-**	**-**	*The total budget is reduced 990*

[Attachment-A]

Activity	Unit	Unit cost	Qty	Total (USD)	Budget allocation by year (USD)				Remark
					2020	2021	2022	2023	
ha of planting NTFP under the canopy of P. caribaea; 2 ha of planting native species under the canopy of P. caribaea; target provinces of Vinh Phuc and Quang Ninh)									*cause by the budget from data collection cost is saved from the last surveying. However the target is the same.*
- Domestic consultant (survey to select sites and design 11 ha of plantation models) (8 days for field + 6 days for report writing)	man-day	150	14	2.100	2.100				
- DSA for consultant (4 days per site x 2 sites)	day	35	8	280	280				
- Lodging for consultant (7 nights in 2 sites)	night	30	7	210	210				
- DSA for staff (4 days x 2 people x 2 sites)	day	35	16	560	560				
- Lodging for staff (3 nights x 2 people in Quang Ninh)	night	30	6	180	180				
- Hire local people to assist in the field (3 man-day/site x 2 sites)	man-day	40	6	240	240				
- Car hiring (4 days to Quang Ninh)	day	110	4	440	440				
F.2. Develop pure plantation model of P. caribaea to provide sawlog (4 ha in 2 sites: Vinh Phuc and Quang Ninh; planting density 1100 tree/ha)				***43.454***	***-***	***21.406***	***14.264***	***7.784***	*The total budget is increased USD 28.454 caused by DSA unit cost is raised. However, the*

[Attachment-A]

Activity	Unit	Unit cost	Qty	Total (USD)	Budget allocation by year (USD)				Remark
					2020	2021	2022	2023	
									target is the same
F.2.1. Model establishment				*14.926*	-	*14.926*	-	-	
- Domestic consultant (5 man-day/site x 2 sites)	man-day	150	10	1.500		1.500			
- DSA for consultant (5 days per site x 2 sites)	day	35	10	350		350			
- Lodging for consultant (9 nights in 2 sites)	night	30	9	270		270			
- DSA for staff (5 days x 2 people x 2 sites)	day	35	20	700		700			
- Lodging for staff (4 nights x 2 people in Quang Ninh)	night	30	8	240		240			
- Hire local people for clearing vegetation, digging holes, fertilizing, planting trees, etc. (60 man-day/ha x 4 ha)	man-day	40	240	9.600		9.600			
- Car hiring (5 days to Quang Ninh)	day	110	5	550		550			
- NPK fertilizer (0.3 kg/tree x 1100 tree/ha x 4 ha)	kg	0,6	1.320	792		792			
- Microbiological fertilizer (0.3 kg/tree x 1100 tree/ha x 4 ha)	kg	0,3	1.320	396		396			
- Supe phosphate fertilizer (0.3 kg/tree x 1100 tree/ha x 4 ha)	kg	0,4	1.320	528		528			
F.2.2. Model tending (total 4 times: 1 in 2021 + 2 in 2022 + 1 in 2023)				*21.768*	-	*4.790*	*10.884*	*6.094*	
- Domestic consultant to monitor model tending (8 man-day/time x 4 times)	man-day	150	32	4.800		1.200	2.400	1.200	

[Attachment-A]

Activity	Unit	Unit cost	Qty	Total (USD)	Budget allocation by year (USD)				Remark
					2020	2021	2022	2023	
- DSA for consultant (8 days per time x 4 times)	day	35	32	1.120		280	560	280	
- Lodging for consultant (7 nights per time x 4 times)	night	30	28	840		210	420	210	
- DSA for staff (4 days per time x 4 times x 2 people x 2 sites)	day	35	64	2.240		560	1.120	560	
- Lodging for staff (3 nights per time x 4 times x 2 people in Quang Ninh)	night	30	24	720		180	360	180	
- Hire local people to clear weeds, vines, and shrubs; and to hoe and hill up trees (10 man-day/ha x 4 ha x 4 times)	man-day	40	160	6.400		1.600	3.200	1.600	
- Hire local people to replant the failures (2 man-day/ha x 4 ha x 2 in 2021-2022)	man-day	40	16	640		320	320		
- Hire local people for fertilizing (3 man-day/ha x 4 ha x 2 in 2022-2023)	man-day	40	24	960			480	480	
- Car hiring (4 days per time x 4 times to in Quang Ninh)	day	110	16	1.760		440	880	440	
- NPK fertilizer (0.3 kg/tree x 1100 tree/ha x 4ha x 2 years (2022-2023))	kg	0,6	2.640	1.584			792	792	
- Supe composition fertilizer (0,2 kg/tree x 1100 tree/ha x 4ha x 2 years (2022-2023))	kg	0,4	1.760	704			352	352	
F.2.3. Collecting and analysing data (4 times: 1 in 2021 + 2 in 2022 + 1 in 2023)				*6.760*	-	*1.690*	*3.380*	*1.690*	
- Domestic consultant for field data collection, data analysis and report writing (6 man-days per time (4 days for field + 2 days for report writing) x 4 times)	man-day	150	24	3.600		900	1.800	900	
- DSA for consultant (4 days per time x 4 times)	day	*35*	16	560		140	280	140	

[Attachment-A]

Activity	Unit	Unit cost	Qty	Total (USD)	Budget allocation by year (USD)				Remark
					2020	2021	2022	2023	
- Lodging for consultant (3 nights per time x 4 times)	night	*30*	12	360		90	180	90	
- DSA for staff (4 days per time x 4 times x 2 people for 2 sites)	Day	*35*	32	1.120		280	560	280	
- Lodging for staff (1 night per time x 4 times x 2 people in Quang Ninh)	night	*30*	8	240		60	120	60	
- Car hiring (2 days per time x 4 times in Quang Ninh)	Day	110	8	880		220	440	220	
F.3. Develop of mix plantation model (3 ha in 2 sites; planting density 1100 tree/ha)				***34.453***	***-***	***17.407***	***11.093***	***5.953***	*The total budget is increased USD 19.453 caused by DSA unit cost is raised. However, the target is the same.*
F.3.1. Establishing model				*12.267*	-	*12.267*	-	-	
- Domestic consultant (3 man-day/site x 2 sites)	man-day	150	6	900		900			
- DSA for consultant (3 days per site x 2 sites)	Day	35	6	210		210			
- Lodging for consultant (5 sites in 2 sites)	night	30	5	150		150			
- DSA for staff (3 days x 2 people x 2 sites)	Day	35	12	420		420			
- Lodging for staff (2 nights x 2 people in Quang Ninh)	night	30	4	120		120			
- Hire local people for clearing vegetation, digging holes, fertilizing, planting trees, etc. (60 man-day/ha x 3 ha)	man-day	40	180	7.200		7.200			

[Attachment-A]

Activity	Unit	Unit cost	Qty	Total (USD)	Budget allocation by year (USD)				Remark
					2020	2021	2022	2023	
- Car hiring (3 days to in Quang Ninh)	Day	110	3	330		330			
- Seedlings for mixed planting (Michelia mediocris/Cinnamomum parthenoxylon/etc.) (550 tree/ha x 3 ha)	Tree	1	1.650	1.650		1.650			
- NPK composition fertilizer (0.3 kg/tree x 1100 tree/ha x 3 ha)	Kg	0,6	990	594		594			
- Microbiological fertilizer (0.3 kg/tree x 1100 tree/ha x 3 ha)	Kg	0,3	990	297		297			
- Supe phosphate composition fertilizer (0.3 kg/tree x 1100 tree/ha x 3 ha)	Kg	0,4	990	396		396			
F.3.2. Model tending (4 times: 1 in 2021 + 2 in 2022 + 1 in 2023)				*16.566*	-	*3.735*	*8.283*	*4.548*	
- Domestic consultant to monitor model tending (6 man-day/time x 4 times)	man-day	150	24	3.600		900	1.800	900	
- DSA for consultant (6 days per time x 4 times)	Day	35	24	840		210	420	210	
- Lodging for consultant (5 nights per time x 4 times)	night	30	20	600		150	300	150	
- DSA for staff (6 days per time x 4 times x 2 people for 2 sites)	Day	35	48	1.680		420	840	420	
- Lodging for staff (2 nights per time x 4 times x 2 people in Quang Ninh)	night	30	16	480		120	240	120	
- Hire local people to clear weeds, vines, and shrubs; and to hoe and hill up trees (10 man-day/ha x 3 ha x 4 times)	man-day	40	120	4.800		1.200	2.400	1.200	
- Hire local people to replant the failures (2 man-day/ha x	man-day	40	12	480		240	240		

Activity	Unit	Unit cost	Qty	Total (USD)	Budget allocation by year (USD)				Remark
					2020	2021	2022	2023	
3 ha x 2 times: 2021 and 2022)									
- Hire local people for fertilizing (3 man-day/ha x 3 ha x 2 in 2021-2022)	man-day	40	18	720			360	360	
- Car hiring (3 days per time x 4 times to in Quang Ninh)	Day	110	12	1.320		330	660	330	
- Seedlings for mixed planting (Michelia mediocris/Cinnamomum parthenoxylon/etc.) (10% x 550tree/ha x 3 ha x 2 in 2021-2022)	Tree	1	330	330		165	165		
- NPK fertilizer (0.3 kg/tree x 1100 tree/ha x 3ha x 2 years (2022-2023))	Kg	0,6	1.980	1.188			594	594	
- Supe phosphate fertilizer (0,2 kg/tree x 1100 tree/ha x 3ha x 2 years (2022-2023))	Kg	0,4	1.320	528			264	264	
F.3.3. Collecting and analysing data (4 times: 1 in 2021 + 2 in 2022 + 1 in 2023)				*5.620*	-	*1.405*	*2.810*	*1.405*	
- Domestic consultant for field data collection, data analysis and report writing (5 man-days per time (3 days for field + 2 days for report writing) x 4 times)	man-day	150	20	3.000		750	1.500	750	
- DSA for consultant (3 days per time x 4 times)	Day	*35*	12	420		105	210	105	
- Lodging for consultant (2 nights per time x 4 times)	night	*30*	8	240		60	120	60	
- DSA for staff (3 days per time x 4 times x 2 people for 2 sites)	Day	*35*	24	840		210	420	210	
- Lodging for staff (1 night per time x 4 times x 2 people in Quang Ninh)	night	*30*	8	240		60	120	60	
- Car hiring (2 days per time x 4 times to in Quang Ninh)	Day	110	8	880		220	440	220	

[Attachment-A]

Activity	Unit	Unit cost	Qty	Total (USD)	Budget allocation by year (USD)				Remark
					2020	2021	2022	2023	
F.4 Develop model to plant NTFPs under forest canopy of P. caribaea (2 ha in 2 sites; planting density 500 tree/ha)				***22.300***	**-**	***10.495***	***7.790***	***4.015***	*The total budget is increased USD7.300 caused by the budget is adjusted for main activities and objectives. However, the target is the same.*
F.4.1. Establishing model				*6.720*	-	*6.720*	-	-	
- Domestic consultant (monitor model planting and tending) (3 man-day/site x 2 sites)	man-day	150	6	900		900			
- DSA for consultant (3 days per site x 2 sites)	Day	35	6	210		210			
- Lodging for consultant (5 nights)	night	30	5	150		150			
- DSA for staff (3 days x 2 people x 2 sites)	Day	35	12	420		420			
- Lodging for staff (2 nights x 2 people in Quang Ninh)	night	30	4	120		120			
- Hire local people for clearing vegetation, digging holes, fertilizing, planting trees, etc. (40 man-day/ha x 2 ha)	man-day	40	80	3.200		3.200			
- Car hiring (3 days in Quang Ninh)	Day	110	3	330		330			
- NTFP seedlings (500 tree/ha x 2 ha)	Tree	1	1.000	1.000		1.000			

[Attachment-A]

Activity	Unit	Unit cost	Qty	Total (USD)	Budget allocation by year (USD)				Remark
					2020	2021	2022	2023	
- NPK fertilizer (0.3 kg/tree x 500 tree/ha x 2 ha)	Kg	0,6	300	180		180			
- Microbiological fertilizer (0.3 kg/tree x 500 tree/ha x 2 ha)	Kg	0,3	300	90		90			
- Supe phosphate fertilizer (0.3 kg/tree x 500 tree/ha x 2 ha)	Kg	0,4	300	120		120			
F.4.2. Model tending (4 times: 1 in 2021 + 2 in 2022 + 1 in 2023)				*9.960*	-	*2.370*	*4.980*	*2.610*	
- Domestic consultant to monitor model tending (4 man-day/time x 4 times)	man-day	150	16	2.400		600	1.200	600	
- DSA for consultant (4 days per time x 4 times)	Day	35	16	560		140	280	140	
- Lodging for consultant (3 nights per time x 4 times)	night	30	12	360		90	180	90	
- DSA for staff (2 days per time x 4 times x 2 people x 2 sites)	Day	35	32	1.120		280	560	280	
- Lodging for staff (1 night per time x 4 times x 2 people in Quang Ninh)	night	30	8	240		60	120	60	
- Hire local people to clear weeds, vines, and shrubs; and to hoe and hill up trees (10 man-day/ha x 2 ha x 4 times)	man-day	40	80	3.200		800	1.600	800	
- Hire local people to replant the failures (1 man-day/ha per time x 2 ha x 2 in 2021-2022)	man-day	40	4	160		80	80	-	
- Hire local people for fertilizing (2 man-day/ha x 2 ha x 2 in 2021-2022)	man-day	40	8	320		-	160	160	
- Car hiring (2 days per time x 4 times to in Quang Ninh)	Day	110	8	880		220	440	220	

[Attachment-A]

Activity	Unit	Unit cost	Qty	Total (USD)	Budget allocation by year (USD)				Remark
					2020	2021	2022	2023	
- NTFP seedlings (10% x 500 tree/ha x 2 ha x 2 in 2021-2022)	Tree	1	200	200		100	100	-	
- NPK fertilizer (0.3 kg/tree x 500 tree/ha x 2ha x 2 years (2022-2023))	Kg	0,6	600	360			180	180	
- Supe phosphate fertilizer (0,2 kg/tree x 500 tree/ha x 2ha x 2 years (2022-2023))	Kg	0,4	400	160			80	80	
F.4.3. Collecting and analysing data (4 times: 1 in 2021 + 2 in 2022 + 1 in 2023)				*5.620*	-	*1.405*	*2.810*	*1.405*	
- Domestic consultant for field data collection, data analysis and report writing (5 man-days per time (3 days for field + 2 days for report writing) x 4 times)	man-day	150	20	3.000		750	1.500	750	
- DSA for consultant (3 days per time x 4 times)	Day	*35*	12	420		105	210	105	
- Lodging for consultant (2 nights per time x 4 times)	night	*30*	8	240		60	120	60	
- DSA for staff (3 days per time x 4 times x 2 people for 2 sites)	Day	*35*	24	840		210	420	210	
- Lodging for staff (1 night per time x 4 times x 2 people in Quang Ninh)	night	*30*	8	240		60	120	60	
- Car hiring (2 days per time x 4 times to in Quang Ninh)	Day	110	8	880		220	440	220	
F.5. Develop model to plant native species under the forest canopy of P. caribaea (2 ha in 2 sites; planting density 500 tree/ha)				***22.300***	***-***	***10.495***	***7.790***	***4.015***	*The total budget is increased USD 7.300 caused by the budget is adjusted for main activities*

[Attachment-A]

Activity	Unit	Unit cost	Qty	Total (USD)	Budget allocation by year (USD)				Remark
					2020	2021	2022	2023	
									and objectives. However, the target is the same.
F.5.1. Establishing model				*6.720*	-	*6.720*	-	-	
- Domestic consultant to monitor model planting and tending (3 man-day/site x 2 sites)	man-day	150	6	900		900			
- DSA for consultant (3 days per site x 2 sites)	Day	35	6	210		210			
- Lodging for consultant (5 nights)	night	30	5	150		150			
- DSA for staff (3 days x 2 people x 2 sites)	Day	35	12	420		420			
- Lodging for staff (2 nights x 2 people in Quang Ninh)	night	30	4	120		120			
- Hire local people for clearing vegetation, digging holes, fertilizing, planting trees, etc. (40 man-day/ha x 2 ha)	man-day	40	80	3.200		3.200			
- Car hiring (3 days to in Quang Ninh)	Day	110	3	330		330			
- Native seedlings (e.g. Erythrophleum fordii, Cinnamomum parthenoxylon, Chukrasia tabularis, etc.) (500 tree/ha x 2 ha)	Tree	1	1.000	1.000		1.000			
- NPK fertilizer (0.3 kg/tree x 500 tree/ha x 2 ha)	Kg	0,6	300	180		180			
- Microbiological fertilizer (0.3 kg/tree x 500 tree/ha x 2 ha)	Kg	0,3	300	90		90			
- Supe phosphate fertilizer (0.3 kg/tree x 500 tree/ha x 2 ha)	Kg	0,4	300	120		120			

[Attachment-A]

Activity	Unit	Unit cost	Qty	Total (USD)	Budget allocation by year (USD)				Remark
					2020	2021	2022	2023	
F.5.2. Model tending (4 times: 1 in 2021 + 2 in 2022 + 1 in 2023)				*9.960*	-	*2.370*	*4.980*	*2.610*	
- Domestic consultant to monitor model tending (4 man-day/time x 4 times)	man-day	150	16	2.400		600	1.200	600	
- DSA for consultant (4 days per time x 4 times)	Day	35	16	560		140	280	140	
- Lodging for consultant (3 nights per time x 4 times)	night	30	12	360		90	180	90	
- DSA for staff (2 days per time x 4 times x 2 people x 2 sites)	Day	35	32	1.120		280	560	280	
- Lodging for staff (1 night per time x 4 times x 2 people in Quang Ninh)	night	30	8	240		60	120	60	
- Hire local people to clear weeds, vines, and shrubs; and to hoe and hill up trees (10 man-day/ha x 2 ha x 4 times)	man-day	40	80	3.200		800	1.600	800	
- Hire local people to replant the failures (1 man-day/ha x 2 ha x 2 in 2021-2022)	man-day	40	4	160		80	80	-	
- Hire local people for fertilizing (2 man-day/ha x 2 ha x 2 in 2022-2023)	man-day	40	8	320		-	160	160	
- Car hiring (2 days per time x 4 times to Quang Ninh)	Day	110	8	880		220	440	220	
- Native seedlings (10% x 500 tree/ha x 2 ha x 2 in 2021-2022)	Tree	1	200	200		100	100	-	
- NPK fertilizer (0.3 kg/tree x 500 tree/ha x 2ha x 2 years (2022-2023))	Kg	0,6	600	360		-	180	180	
- Supe phosphate fertilizer (0,2 kg/tree x 500 tree/ha x 2ha x 2 years (2022-2023))	Kg	0,4	400	160		-	80	80	

Activity	Unit	Unit cost	Qty	Total (USD)	Budget allocation by year (USD)				Remark
					2020	2021	2022	2023	
F.5.3. Collecting and analysing data (4 times: 1 in 2021 + 2 in 2022 + 1 in 2023)				*5.620*	-	*1.405*	*2.810*	*1.405*	
- Domestic consultant for field data collection, data analysis and report writing (5 man-days per time (3 days for field + 2 days for report writing) x 4 times)	man-day	150	20	3.000		750	1.500	750	
- DSA for consultant (3 days per time x 4 times)	Day	*35*	12	420		105	210	105	
- Lodging for consultant (2 nights per time x 4 times)	night	*30*	8	240		60	120	60	
- DSA for staff (3 days per time x 4 times x 2 people for 2 sites)	Day	*35*	24	840		210	420	210	
- Lodging for staff (1 night per time x 4 times x 2 people in Quang Ninh)	night	*30*	8	240		60	120	60	
- Car hiring (2 days per time x 4 times to in Quang Ninh)	Day	110	8	880		220	440	220	
Output 7. Provide technical training on forest rehabilitation, determination of soil/site conditions for planting P. caribaea				**9.520**	**-**	**9.520**	**-**	**-**	
G.1. Technical training on determination of soil/site conditions for planting P. caribaea (2 courses in Vinh Phuc and Quang Ninh)				***4.760***	**-**	***4.760***	**-**	**-**	*The total is decreased by USD 2.240 caused by the DSA is considered as no using AFoCO's grant.*
- Domestic consultant to prepare training materials (4	man-day	150	4	600		600			

[Attachment-A]

Activity	Unit	Unit cost	Qty	Total (USD)	Budget allocation by year (USD)				Remark
					2020	2021	2022	2023	
man-day)									
- Consultant for training (2 days per course x 2 courses)	man-day	150	4	600		600			
- DSA for consultant (2 days per course x 2 courses)	Day	35	4	140		140			
- Lodging for consultant (1 night per course x 2 courses)	night	30	2	60		60			
- DSA for staff (2 days x 2 people x 2 courses)	Day	35	8	280		280			
- Lodging for staff (1 night x 2 people in Quang Ninh)	night	30	2	60		60			
- DSA for participants (2 days per course x 2 courses x 20 persons per course)	Day	35	80	2.800		2.800			
- Car hiring (2 days to Quang Ninh)	Day	110	2	220		220			
G.2. Technical training on forest rehabilitation (2 courses in Vinh Phuc and Quang Ninh; 2 days per course)				***4.760***	**-**	***4.760***	**-**	**-**	*The total is decreased by USD 2.240 caused by the DSA is considered as no using AFoCO's grant.*
- Domestic consultant to prepare training materials (4 man-day)	man-day	150	4	600		600			
- Consultant for training (2 courses x 2 days per course)	man-day	150	4	600		600			
- DSA for consultant (2 courses x 2 days per course)	Day	35	4	140		140			

[Attachment-A]

Activity	Unit	Unit cost	Qty	Total (USD)	Budget allocation by year (USD)				Remark
					2020	2021	2022	2023	
- Lodging for consultant (2 courses x 1 night per course)	night	30	2	60		60			
- DSA for staff (2 days x 2 people x 2 courses)	Day	35	8	280		280			
- Lodging for staff (1 night x 2 people in Quang Ninh)	night	30	2	60		60			
- DSA for participants (2 days per course x 2 courses x 20 persons per course)	Day	35	80	2.800		2.800			
- Car hiring (2 days for survey in Quang Ninh)	Day	110	2	220		220			
Output 8. Conduct activities of communication, capacity building and awareness raising on intensive forest plantation (2 training courses x 20 persons per course x 2 days per course; in 2022-2023)				**4.660**	**-**	**-**	**2.630**	**2.030**	
H.1. Training and experience sharing for stakeholders									*The total budget is increased by USD 660 caused by DSA of technical is raised.*
- Domestic consultant to prepare training materials (4 man-day)	man-day	150	4	600			600		
- Consultant for training (2 man-day/course x 2 courses)	man-day	150	4	600			300	300	
- DSA for consultant (2 days per course 2 courses)	Day	35	4	140			70	70	
- Lodging for consultant (1 night per course x 2 courses)	night	30	2	60			30	30	

[Attachment-A]

Activity	Unit	Unit cost	Qty	Total (USD)	Budget allocation by year (USD)				Remark
					2020	2021	2022	2023	
- DSA for participants (2 days per course x 2 courses x 20 persons per course)	Day	35	80	2.800			1.400	1.400	
- DSA for staff to organize trainings (2 people x 3 man-days per course x 2 courses)	man-day	35	12	420			210	210	
- Printing, copying, stationery, etc.	lump-sum			40			20	20	
Objective 3. Develop appropriate techniques to process and preserve *P. caribaea* timber to meet the market requirements				**47.340**	**29.840**	**12.740**	**2.755**	**2.005**	
Output 9. Survey and assess markets of pine wood and P. caribaea timber inside and outside the country				**17.100**	**17.100**	**-**	**-**	**-**	
I.1. Survey, evaluate the consumption of pine wood and P. caribaea timber at the timber processing centres in the north, central and south regions				***8.550***	***8.550***	**-**	**-**	**-**	*The total budget is decreased by USD 1.450 caused by the budget is adjusted for main objectives. However, the target is the same.*
- Domestic consultant (survey and evaluate the current status of consumption of pine wood and P. caribaea timber) (18 days for field + 3 days for report writing)	man-day	150	21	3.150	3.150				

[Attachment-A]

Activity	Unit	Unit cost	Qty	Total (USD)	Budget allocation by year (USD)				Remark
					2020	2021	2022	2023	
- DSA for consultant (18 days for field)	Day	35	18	630	630				
- Lodging for consultant (17 nights)	night	30	17	510	510				
- DSA for staff (18 days x 2 people)	Day	35	36	1.260	1.260				
- Lodging for staff (17 nights x 2 people)	night	30	34	1.020	1.020				
- Car hiring (18 days)	Day	110	18	1.980	1.980				
I.2. Survey, evaluate markets of P. caribaea timber inside and outside the country				***8.550***	***8.550***	***-***	***-***	***-***	*The total budget is decreased by USD 1.450 caused by the budget is adjusted for main objectives. However, the target is the same.*
- Domestic consultant to survey and evaluate the market for pine wood and P. caribaea timber (18 days for field + 3 days for report writing)	man-day	150	21	3.150	3.150				
- DSA for consultant (18 days for field)	Day	35	18	630	630				
- Lodging for consultant (17 nights)	night	30	17	510	510				
- DSA for staff (18 days x 2 people)	Day	35	36	1.260	1.260				

[Attachment-A]

Activity	Unit	Unit cost	Qty	Total (USD)	Budget allocation by year (USD)				Remark
					2020	2021	2022	2023	
- Lodging for staff (17 nights x 2 people)	night	30	34	1.020	1.020				
- Car hiring (18 days)	Day	110	18	1.980	1.980				
Output 10. Complete P. caribaea timber preservation techniques				**8.960**	**4.480**	**4.480**	**-**	**-**	
J.1. Temporary post-harvesting wood preservation technique				***4.000***	***2.000***	***2.000***	**-**	**-**	*The total budget is reduced by USD 2.000 caused by the budget is transferred to main objectives Ho wever, the target is the same.*
- Domestic consultant (design and develop technical guideline to preserve post-harvest wood of P. caribaea) (8 man-day/year x 2 years)	man-day	150	16	2.400	1.200	1.200			
- DSA for consultant (6 days per year x 2 years)	Day	35	12	420	210	210			
- Lodging for consultant (5 nights per year x 2 years)	night	30	10	300	150	150			
- Buy round wood (1 m3 per year x 2 years)	m^3	250	2	500	250	250			
- Materials, tools (chemicals, etc.)	lump-sum			380	190	190			
J.2. Post-sawing timber preservation techniques for				***4.960***	***2.480***	***2.480***	**-**	**-**	*The total budget is*

Activity	Unit	Unit cost	Qty	Total (USD)	Budget allocation by year (USD)				Remark
					2020	2021	2022	2023	
making woodworking joints									*reduced by USD 1.040 caused by the budget is transferred to main objectives. However, the target is the same.*
- Domestic consultant (design and develop technical guideline to preserve post-sawn timber of P. caribaea for making woodworking joints) (10 man-day/year x 2 years)	man-day	150	20	3.000	1.500	1.500			
- DSA for consultant (7 days per year x 2 years)	Day	35	14	490	245	245			
- Lodging for consultant (6 nights per year x 2 years)	night	30	12	360	180	180			
- Hire workers to process wood (4 man-day/year x 2 years)	man-day	40	8	320	160	160			
- Buy round log (1 m3 per year x 2 years)	m3	250	2	500	250	250			
- Materials, tools (Materials, tools)	lump-sum			290	145	145			
Output 11. Develop techniques to produce P. caribaea wood finger joint boards				**16.520**	**8.260**	**8.260**	**-**	**-**	
K.1. Develop P. caribaea wood processing technique for the production of finger joint boards				***8.580***	***4.290***	***4.290***	**-**	**-**	*The total budget is reduced by USD 420*

Activity	Unit	Unit cost	Qty	Total (USD)	Budget allocation by year (USD)				Remark
					2020	2021	2022	2023	
									caused by the budget is transferred to main objectives. However, the target is the same.
- Domestic consultant (design and develop technical guideline to produce finger joint boards from P. caribaea timber). (9 man-day/year x 2 years)	man-day	150	18	2.700	1.350	1.350			
- DSA for consultant (7 days per year x 2 years)	Day	35	14	490	245	245			
- Lodging for consultant (6 nights per year x 2 years)	night	30	12	360	180	180			
- Buy round wood (4 m3 per year x 2 years)	m^3	250	8	2.000	1.000	1.000			
- Hire workers to saw and process wood (15 man-day/year x 2 years)	man-day	40	30	1.200	600	600			
- Hire workers to process wood (20 man-day/year x 2 years)	man-day	40	40	1.600	800	800			
- Materials, tools	lump-sum			230	115	115			
K.2. Develop P. caribaea wood processing technique for the thin wood/veneer production				***7.940***	***3.970***	***3.970***	***-***	***-***	*The total budget is reduced by USD 1.060 caused by the budget is*

Activity	Unit	Unit cost	Qty	Total (USD)	Budget allocation by year (USD)				Remark
					2020	2021	2022	2023	
									transferred to main objectives. However, the target is the same.
- Domestic consultant (design and develop technical guideline to produce veneer from P. caribaea timber) (10 man-day/year x 2 years)	man-day	150	20	3.000	1.500	1.500			
- DSA for consultant (8 days per year x 2 years)	Day	35	16	560	280	280			
- Lodging for consultant (7 nights per year x 2 years)	night	30	14	420	210	210			
- Buy round wood (4,0 m3 per year x 2 years)	m3	250	8	2.000	1.000	1.000			
- Hire workers to process wood (22 man-day/year x 2 years)	man-day	40	44	1.760	880	880			
- Materials, tools	lump-sum			200	100	100			
Output 12. Conduct communication activities, capacity building, awareness raising on preservation and processing of post-harvesting P. caribaea timber (2 training courses (2022 and 2023) x 2 days per course x 20 persons per course)				**4.760**	**-**	**-**	**2.755**	**2.005**	
L.1. Training and experience sharing for stakeholders				***4.760***	**-**	**-**	***2.755***	***2.005***	*The budget of this activity is increased by USD 760 caused by DSA*

[Attachment-A]

Activity	Unit	Unit cost	Qty	Total (USD)	Budget allocation by year (USD)				Remark
					2020	2021	2022	2023	
									of technical staff is raised.
- Domestic consultant (prepare for training materials) (5 man-day)	man-day	150	5	750			750	-	
- Consultant for training (2 man-day/course x 2 courses)	man-day	150	4	600			300	300	
- DSA for consultant (2 days per course x 2 courses)	Day	35	4	140			70	70	
- DSA for participants (2 days per course x 2 courses x 20 persons per course)	Day	35	80	2.800			1.400	1.400	
- DSA for staff to organize the training courses. (2 people x 3 man-days per course x 2 courses)	man-day	35	12	420			210	210	
- Printing, copying, stationery, etc.	lump-sum			50			25	25	
I. SUBTOTAL (Objective 1-3)				**431.920**	**139.841**	**155.983**	**88.118**	**47.978**	
II. SUPPORT EXPENSES				**54.080**	**12.880**	**16.500**	**8.700**	**16.000**	
1 Inception meeting, mid-term and final workshops				**20.600**	**6.000**	**7.300**	**-**	**7.300**	*The budget of these activities are increased USD 20.600 caused by the proposal is not concluded this activity of using AFoCO's grant*

[Attachment-A]

Activity	Unit	Unit cost	Qty	Total (USD)	Budget allocation by year (USD)				Remark
					2020	2021	2022	2023	
1.1. Inception meeting (30 participants; 1 day)				***6.000***	***6.000***	***-***	***-***	***-***	
- Meeting package (meeting room, banner, projector, drink water, etc.)	Day	600	1	600	600				
- Coffee break (2 times/day x 5 US$/person)	person	10	30	300	300				
Welcome dinner for participants (30 participants)	person	35	30	1.050	1.050				
- Lunch (30 participants)	person	30	30	900	900				
- DSA for participants (30 participants)	person	35	30	1.050	1.050				
- Lodging for participants from other provinces (20 participants)	person	30	20	600	600				
- Travel for participants from other provinces (20 participants)	person	50	20	1.000	1.000				
- DSA for staff to organize the meeting (4 staffs; 3 days for each)	Day	35	12	420	420				
- Stationery, printing, copying, etc.	lump-sum			80	80				
1.2. Mid-term workshop (expected 30 participants; 1 day for meeting and 1/2 days for field)				***7.300***	***-***	***7.300***	***-***	***-***	
- Meeting package (meeting room, banner, projector, drink water, etc.)	Day	600	1	600		600			
- Coffee break (2 times/day x 5 US$/person)	person	10	30	300		300			
- Welcome dinner for participants (30 participants)	person	35	30	1.050		1.050			

[Attachment-A]

Activity	Unit	Unit cost	Qty	Total (USD)	Budget allocation by year (USD)				Remark
					2020	2021	2022	2023	
- Lunch (30 participants)	person	30	30	900		900			
- DSA for participants (30 participants; 2 days)	person	35	60	2.100		2.100			
- Lodging for participants from other provinces (20 participants)	person	30	20	600		600			
- Travel for participants from other provinces (20 participants)	person	50	20	1.000		1.000			
- DSA for staff to organize meeting and field trip (4 staffs; 3 days for each)	Day	35	12	420		420			
- Car hiring (1 trip; 1/2 days)	Trip	200	1	200		200			
- Stationery, printing, copying, etc.	lump-sum			130		130			
1.3. Final workshop (expected 30 participants; 1 day for meeting and 1/2 days for field)				***7.300***	***-***	***-***	***-***	***7.300***	
- Meeting package (meeting room, banner, projector, drink water, etc.)	Day	600	1	600				600	
- Coffee break (2 times/day x 5 US$/person)	person	10	30	300				300	
- Welcome dinner for participants (30 participants)	person	35	30	1.050				1.050	
- Lunch (30 participants)	person	30	30	900				900	
- DSA for participants (30 participants; 2 days)	person	35	60	2.100				2.100	
- Lodging for participants from other provinces (20 participants)	person	30	20	600				600	

[Attachment-A]

Activity	Unit	Unit cost	Qty	Total (USD)	Budget allocation by year (USD)				Remark
					2020	2021	2022	2023	
- Travel for participants from other provinces (20 participants)	person	50	20	1.000				1.000	
- DSA for staff to organize the meeting and field trip (4 staffs; 3 days for each)	Day	35	12	420				420	
- Car hiring (1 trip; 1/2 days)	Trip	200	1	200				200	
- Stationery, printing, copying, etc.	lump-sum			130				130	
2. Expenses for staff attending training courses abroad (expected training in Myanmar for 2 people in 4 days)				**1.280**	**1.280**	**-**	**-**	**-**	**This activity is considered as added activity as AFoCO's require with total budget added by 1.280 USD**
- Round-trip air ticket (2 people)	ticket	500	2	1.000	1.000				
- DSA for staff (4 days x 2 people)	Day	35	8	280	280				
3. Hire contract staff to assist the PMU (one staff for 42 months)	**month**	**600**	**42**	**25.200**	**3.600**	**7.200**	**7.200**	**7.200**	*The total budget of this activity is decreased USD 16.800 by the DSA for contract staff is optimized for main objectives and activities.*

[Attachment-A]

Activity	Unit	Unit cost	Qty	Total (USD)	Budget allocation by year (USD)				Remark
					2020	2021	2022	2023	
									However the target is the same
4. Contingency cost	**lump-sum**			**7.000**	**2.000**	**2.000**	**1.500**	**1.500**	*The total budget of contingency is decreased USD 13.000. However the target is the same*
III. Common Expenses of Project				**0**					
1. Travel				**0**					*The budget of this activity is reduced by USD 28,000 caused by the budget will be allocated in detailed of each activity above*
2. Auditing				**0**					*The budget of this activity is reduced by USD 10,000 caused by the budget will be covered by national*

[Attachment-A]

Activity	Unit	Unit cost	Qty	Total (USD)	Budget allocation by year (USD)				Remark
					2020	2021	2022	2023	
									contribution
3. PSC and PMU Meetings				**0**					*The budget of this activity is reduced by USD 20,000 caused by the budget will be covered by national contribution*
GRANT FROM AFOCO				**486.000**	**152.721**	**172.483**	**96.818**	**63.978**	
IN-CASH CONRIBUTION FROM VIET NAM (costs for PMU, equipment, auditing, M&E, miscellaneous, etc.)				**73.000**					
IN-KIND CONTRIBUTION FROM VIET NAM (costs for office renovation package, intruments for field,etc.)				**17.200**					
GRANT TOTAL				**576.200**					

Note:

~~The total budget of activities are increased by USD 153.658~~

~~The total budget of activities are decreased by USD 153.658~~

The budget of Common Expenses of Project (58.000 USD) will be covered by national contribution, with clarification as below:

- The car hiring section in proposal is considered as 28.000 USD which was divided into the activity in objectives. It means to be no more "travel" section in the project document;
- The auditing activity in proposal is 10.000 USD that doesn't appear in the project document caused this activity is ensured in national grant from Viet Nam; and,
- The PSC and PMU meeting activity in proposal is 20.000 USD that doesn't appear in the project document caused by the budget of this activity is ensured in national grant from Viet Nam.

Obviously, the targets are the same.

2.2 National Budget of Viet Nam (In-cash)

Activity	Budget from Viet Nam (in-cash)				
	TOTAL	**Year1**	**Year2**	**Year3**	**Year4**
I. Common expenses of project	32.475	7.734	9.494	8.590	6.657
II. Consumable items	22.825	22.825			
III. Travel expenses	5.030	1.262	1.275	1.662	831
IV. Workshops and training courses (publications)	3.893	973	973	973	973
V. Auditing	4.307		2.153	-	2.153
VI. Office renovation packages	4.243	4.243		-	-
VII. Others	227	-	-	227	-
SUM	**73.000**	**37.037**	**13.895**	**11.225**	**10.842**

2.3 National Budget of Viet Nam (In-kind)

No	Name of fixed asset/ Item model	Country of origin	Start date of using	Counterpart value (USD)
1	Research laboratory	Viet Nam	31-Dec-2009	
2	High technology nursery	Viet Nam	31-Dec-2019	
3	Substation, high-voltage, low-voltage lines	Viet Nam	31-Dec-2009	
4	Floor standing AC (LG c508)	Viet Nam	31-Dec-2009	
5	Chipping machine	Viet Nam	16-Nov-2017	
6	Screener machine	Viet Nam	16-Nov-2017	
7	Material mixer	Viet Nam	16-Nov-2017	
8	Container packaging machine	Viet Nam	16-Nov-2017	
9	Vertical band saw machine	Viet Nam	31-Dec-2010	
10	Phigo milling machine	Japan	31-Dec-2010	
11	M71 SVP 202 Paint Spray Gun, item id: JD5, Itawa	China	31-Dec-2009	
12	EC 610 Double sided planer, item id: 3083-Hinoki	China	31-Dec-2009	
13	AN 512 Closed stand jointer, Item ID: 981035 Yuan an	China	31-Dec-2009	
14	AN 20 Thickness planer, Iteam ID: 981034	Taiwan	31-Dec-2009	
15	RL4 Multiple Function Tenoner Mortiser, item ID: 0911002, Ryhlong	Taiwan	31-Dec-2009	
16	WP-310 Air Compressor, Item ID: 08145168	Taiwan	31-Dec-2009	
17	Experimental forest	Viet Nam	31-Dec-1990	
	Total			**17,200**

[Attachment-A]

SECTION D. IMPLEMENTATION ARRANGEMENTS

1. Organizational structure

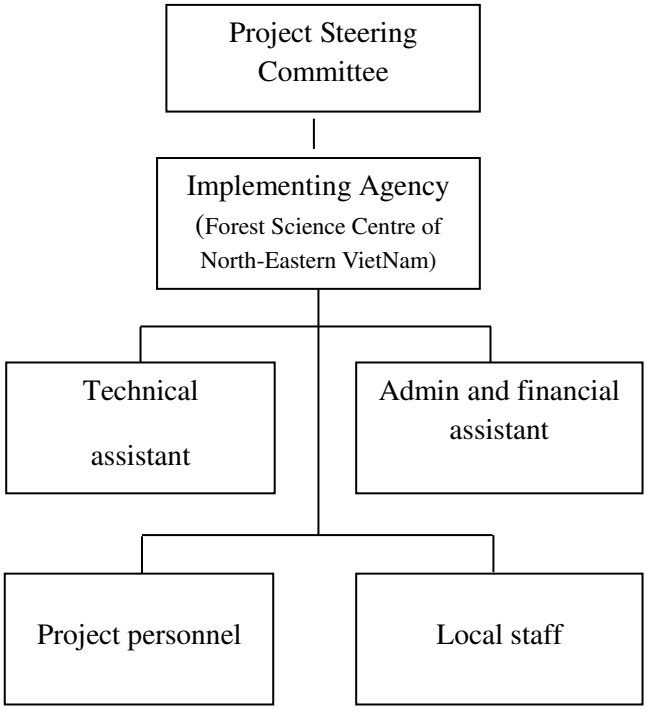

Figure 3. Organizational chart

2. Staff resource plan

No.	Project personnel	Number	Role/Duty station	Remark
I. Project Steering Committee				
1	National Focal Point of Viet Nam	1	Member	
2	Representative of the AFoCO	1	Member	
3	Representative of VAFS	1	Member	
II. Forest Science Centre of North-Eastern VietNam (FSNE)				
1	Project Director	1	Ha Noi-Vinh Phuc	Part time
2	Project Coordinator	1	Ha Noi-Vinh Phuc	Part time
3	Admin assistance	1	Ha Noi-Vinh Phuc	Part time
4	Financial assistance	1	Ha Noi-Vinh Phuc	Part time
5	Technical assistance	1	Ha Noi-Vinh Phuc	Part time
6	Project personnel	1	Ha Noi-Vinh Phuc	Part time
7	Local project staff	2	Vinh Phuc/Quang Ninh	Part time

3. Reporting and monitoring arrangements

No.	Report	Deadlines for submission
1	Progress report (every 6 months)	30 June, 31 December
2	Annual work plan for subsequent year × 1	31 December
3	Financial status report including balance sheet, statement of cash flow and statement of	30 June, 31 December
4	Annual auditing report	31 January of the following year

4. Risk management and sustainability

4.1. Assumptions and risks

Assumptions and risks	Risk management strategy
The ability to flower and fruit of *P. caribaea* species is unstable leading to the shortage of high-quality seeds collected from seed orchards	Seeds of plus trees will be collected and prepared in advance
During the project implementation, model forests may be affected by natural disasters, forest fire or illegal tree cutting	Forest fire prevention belt and trenches to prevent unexpected destruction will be set up. Sign boards to avoid external encroachment will be installed. Outsourced manpower will be hired to take care of model forests during the project implementation. These persons will be responsible for returning the model forests to the project owner when the project is completed. Relationship between local authorities and local people at the project sites will be built to get support from stakeholders.

4.2. Sustainability

The project is based on the strategic objective of responding to and minimizing negative impacts of climate change. Particularly, it is of great importance to degraded land which will be continuously received due attention and investment from the Government as well local authorities and people, contributing to the sustainability of the project.

With the aim of rehabilitation and sustainable development of forests in the degraded regions, the project will make great contribution to the protection of ecological environment, limitation of erosion, maintenance and improvement of biodiversity which help create habitats for many species and reduce greenhouse gas emission. Moreover, rehabilitation and

sustainable development of forest ecosystem will bring about positive social values, especially when direct beneficiaries of the project are local communities. The project will generate jobs and income for local people and communities through their direct participation in forest plantation, rehabilitation and protection.

One of major objectives of the project is to improve the production and supply of high-quality *P. caribaea* seedlings to meet demands for forest plantation in the region. Hence, forests planted from high-quality seedlings on degraded land still retain as stable yield as those planted on other lands and ensure the provision of sustainable materials for timber processing and raw timber material industry.

Besides, infrastructures and facilities of FSNE and research institutes shall be maintained and promoted in *P. caribaea* seedling production as well as processing and production of *P. caribaea* timber in order to meet market requirements. FSNE's research staff are able to perceive technology and technical guideline and apply into production.

The project will help improve capacity of seedling management and sustainable forest plantation for FSNE's young staff, forestry officers and local people in the project area. Upon the project completion, model forests will be handed over to implementing units for protection, exploitation and utilization.