



AFoCO Project Document

Project code	<i>AFoCO/022/2021</i>
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Project Profile			
Project Title	Research on Forest Enrichment using High Valuable Native Species in Hoa Binh Province, Viet Nam		
Project duration	Start date: 1 st April, 2021 End date: 31 st March, 2023		
Implementing Agency	Forest Science Centre of North-Eastern Viet Nam		
Participating Country	Viet Nam		
Project site	Hoa Binh Province, Viet Nam		
Main objectives	<ul style="list-style-type: none"> To assess the status of degraded natural forests, forest enrichment models, techniques applied, and related policies in Hoa Binh province; To develop appropriate technical guideline in forest enrichment using high valuable native species in Hoa Binh province based on assessment results and information attained; To organize technical trainings for relevant stakeholder; and To build demonstration/experiment model on forest enrichment using high valuable native species 		
Target Areas	<ul style="list-style-type: none"> Customized Restoration and Reforestation Models Climate change and forestry 		
Budget and source of finance	Total: US\$ 39,496 AFoCO: US\$ 34,496 National: US\$ 5,000 (in-kind)		
Proponent Profile			
Name/ Position	Dr. Bui Trong Thuy Position: Deputy Director		
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Table of contents

Summary	4
Section A. Research Project Context and Need Analysis	5
1. Background and Research Context	5
2. Problem Statement	5
3. Specific Research Objectives	6
Section B: Materials and Methodologies	6
1. Literature Reviews	6
2. Information on project target area and criteria for site selection	7
3. Research Design and Methodology	8
Section C: Implications and contributions to current body of knowledge	9
1. Expected Outcomes and Outputs	9
2. Practical Implications.....	9
3. Theoretical Implications	10
Section D. Research Budget of Objectives/Outputs/Activities	11
1. Work Plan and Schedule	11
2. Budget plan	12
3. National Contribution (in kind).....	15
Section E. Research Team Members Information	16
1. Research Leader.....	16
2. Other Research Team Members (all members should be listed: add addition pages with the same for mat as required)	18

Summary

(The Summary section is a brief description of the research. It should be presented in narrative form with the information of the problems to be addressed; goals and objectives, and expected outcomes)

(1) Information of the problems/issues to be addressed:

Hoa Binh is a mountainous province, located in the Northwest of Viet Nam. Hoa Binh has 261,837 ha of forest, of which natural forest occupies only 54%, but largely degraded due to a long time of over-exploitation and weak management. The Province has the biggest hydro-electricity plant of Viet Nam, but facing risk of unstable water sources due to degraded watershed natural forests. In addition, Hoa Binh has 824,131 people, belonging to 7 ethnic minorities. Most people in the province are very poor because they depend strongly on limited knowledge and backward cultivation techniques, while the surrounded forests are becoming poorer. It is, therefore, very necessary to improve the degraded natural forest and the livelihood of local people in Hoa Binh province.

The province has paid attention to the improvement of degraded natural forests by protecting and initial enriching some species in poor and degraded natural forests. However, the province still lacks appropriate techniques such as enrichment using suitable native species, and more important to have demonstration models, that local people and relevant stakeholders could learn and apply. Therefore, it is very crucial to implement the research project: “Research on forest enrichment using high valuable native species in Hoa Binh Province, Viet Nam”.

(2) Goals and objectives:

Goal: To improve degraded natural forest in Hoa Binh province by applying forest enrichment measure using high valuable native species, contributing to the increment of the environmental value and livelihood of local people.

Objectives: (i) to assess the status of degraded natural forests, forest enrichment models, techniques applied, and related policies in Hoa Binh province; (ii) to develop appropriate technical guideline in forest enrichment using high valuable native species in Hoa Binh province based on assessment results and information attained; (iii) to organize technical trainings for relevant stakeholder; and (iv) to build demonstration/experiment model on forest enrichment using high valuable native species.

(3) Expected outcomes:

- 01 report on degraded natural forests and management, enrichment models and techniques applied and related policies in Hoa Binh Province;
- 01 guidelines to enrich degraded natural forests by using high valuable native species in Hoa Binh province;
- 04 technical trainings on rehabilitation of degraded natural forests by application of enrichment using high valuable native species for at least 100 relevant participants
- 02 ha of demonstration enrichment models using high valuable native species
- 02 scientific research papers
- Inception report, final report and other technical reports.

Section A. Research Project Context and Need Analysis

1. Background and Research Context

(The Background section should provide factual information about the research topic and outline the scope of the research.)

Viet Nam has promulgated a lot of policies in relation to sustainable forest management and development, such as Viet Nam forestry development strategy for 2006-2020, Sustainable development strategy for 2011-2020; and recently the Forestry Law 2017, accompanied by the Decree 156/2018 to guide the implementation of the Forestry Law 2017... The main objectives of those policies are to increase forest cover and its quality by reforestation, forest rehabilitation and sustainable forest management, while to improve the awareness, knowledge and livelihood of local people.

Despite a great effort to increase forest cover in recent years, the natural forest in large areas of Viet Nam, including Hoa Binh province, is still being degraded, due to illegal logging, forest fire, free grazing, conversion into other land uses, and very important, the un-satisfied forest rehabilitation. Hoa Binh, the mountainous province located in the Northwest, has the biggest hydro-electricity plant of Viet Nam that requires a large and stable natural watershed forest. However, this natural forest is continuing degraded that really needs strong measures to improve both quantity and quality of degraded natural forests. On the other hand, high valuable native species should be paid more attention as they will strongly contribute to the sustainability of the forest and environment, so that contribute to the daily life of local people.

Under the support from AFoCO and NIFoS, the project: “Research on forest enrichment using high valuable native species in Hoa Binh province, Viet Nam” will hopefully be approved and implemented during the period of 2021-2023. The project aims to improve the degraded natural forests in Hoa Binh province by applying measure of forest enrichment using high valuable native species, whilst contributing to the improvement of awareness, knowledge and livelihood of local people.

2. Problem Statement

(Describe the theoretical or practical research problem that you want to address. What is already known about the problem? What is missing from current knowledge?)

The natural forest of Hoa Binh province is being degraded despite the current increment of forest cover. In 2019, the province had 261,837 ha of forest, but only 54% was natural (MARD 2020). The quality of natural forest, on the other hand, is low due to a limited care, continuing illegal harvesting, conversion of natural forest into other land uses and un-satisfied rehabilitation. As a result, around 85% of the natural forest of Hoa Binh is poor and degraded that needs to be urgently rehabilitated to protect the ecological environment and improve the livelihood of local people.

The province has implemented some big programs to recover the bare hills and denude land by forest, but mostly by planting exotic species like Eucalyptus and Acacia for wood and timber production. The province has also built some rehabilitation models for poor and degraded natural

forests, but the scale is small, scattered and un-systematic that make it very difficult to extract guideline and lessons for further application and uses. Native species have been used for forest rehabilitation, including forest enrichment, but the survival rate and growth of those species, in general, are low due to the wrong site-species matching and un-suitable technique applied. The province really needs to continue the research and application of forest enrichment using high valuable native species by reviewing existing models and techniques, also to continue the experiment models to attain the best suitable techniques and species for certain sites and natural forests. Therefore, it is very necessary for the province to implement the project: “Research on forest enrichment using High Valuable Native Species in Hoa Binh Province, Viet Nam”. The knowledge and lessons from the project will be applied for the province, the Northwest and similar ecological zones of Viet Nam to promote natural forest rehabilitation of Hoa Binh province, the Northwest and the whole country.

3. Specific Research Objectives

(What are the specific research objectives the project aims to achieve?)

The project has 4 specific research objectives as follows:

1. To assess the degraded natural forest status, forest enrichment models, techniques applied, and related policies in Hoa Binh province;
2. To develop appropriate technical guideline in forest enrichment using high valuable native species in Hoa Binh province based on assessment results and information attained;
3. To carry out technical trainings for relevant stakeholders in Hoa Binh province; and
4. To build the demonstration plots using the technical guideline. (Those demonstration plots will be maintained even after the termination of the project to attain sufficient results for enhancing the technical guideline and trainings).

Section B: Materials and Methodologies

1. Literature Reviews

(The literature review to summarize existing and related researches including research gaps the project is trying to address)

According to Pham Xuan Hoan (2003), enrichment is a silvicultural methodology to improve the rate of target trees/plants in poor and degraded natural forests, but still remain the existing vegetation and valuable seedlings.

Enrichment using native species has proved to be highly valuable for the rehabilitation and improvement of poor and degraded natural forests in Viet Nam (Nguyen Anh Dung 2001). The valuable enriched trees will then play as mother trees to help generate other new good quality generation (Forest Science Institute of Viet Nam 2006). For instance, the enrichment model using native species of Xoan dao (*Prunus arborea*), Re huong (*Cinamomum*) and De cau (*Quercus platycalyx* Hickel) has improved the quality of natural forest in Doan Hung, Phu Tho Province. The

enrichment models using high valuable native species of Cho chi (*Parashorea chinensis* Wang Hsie), Re gung (*Cinamomum iners*), Lim xanh (*Erythrophloeum fordi*), Soi phang (*Lithocarpus fissus* Champ ex Bent), and Mo (*Manglietia conifera* Dandy) in Hoa Binh province initially show the high survival rate and good growth of native species, while the forest environment is gradually improved (Regional AFoCO Project Report 2018). MARD (2014) introduced a list of native species that could be used in different ecological zones of Viet Nam, including Hoa Binh province, and more native species will be recognized if more researches are being carried out.

Despite the importance of forest enrichment using native species for degraded natural forests, Hoa Binh has only a few un-systematic models and researches on this topic. The results of these models and researches, on the other hand, are difficult to access as they could be kept separably by different people and agencies. According to MARD (2014), Hoa Binh has a list of native species that could be used for reforestation and rehabilitation, but how to match these species with specific sites and how to build the model is remained questions. In reality, there is a lack of researches to assess and synthesize the existing research results and rehabilitation models that could be integrated into the appropriate technical guidance in forest enrichment using high valuable native species in Hoa Binh province. It also needs to continue attaining sufficient data and information from experiment models to enhance the technical guideline for forest enrichment using high valuable native species. It is therefore very necessary to implement the project: “Research on forest enrichment using High Valuable Native Species in Hoa Binh Province, Viet Nam”.

2. Information on project target area and criteria for site selection

(Reference data and baseline information here will provide a scenario, map/point location GPS coordinates, etc. of target area and the criteria for site selection)

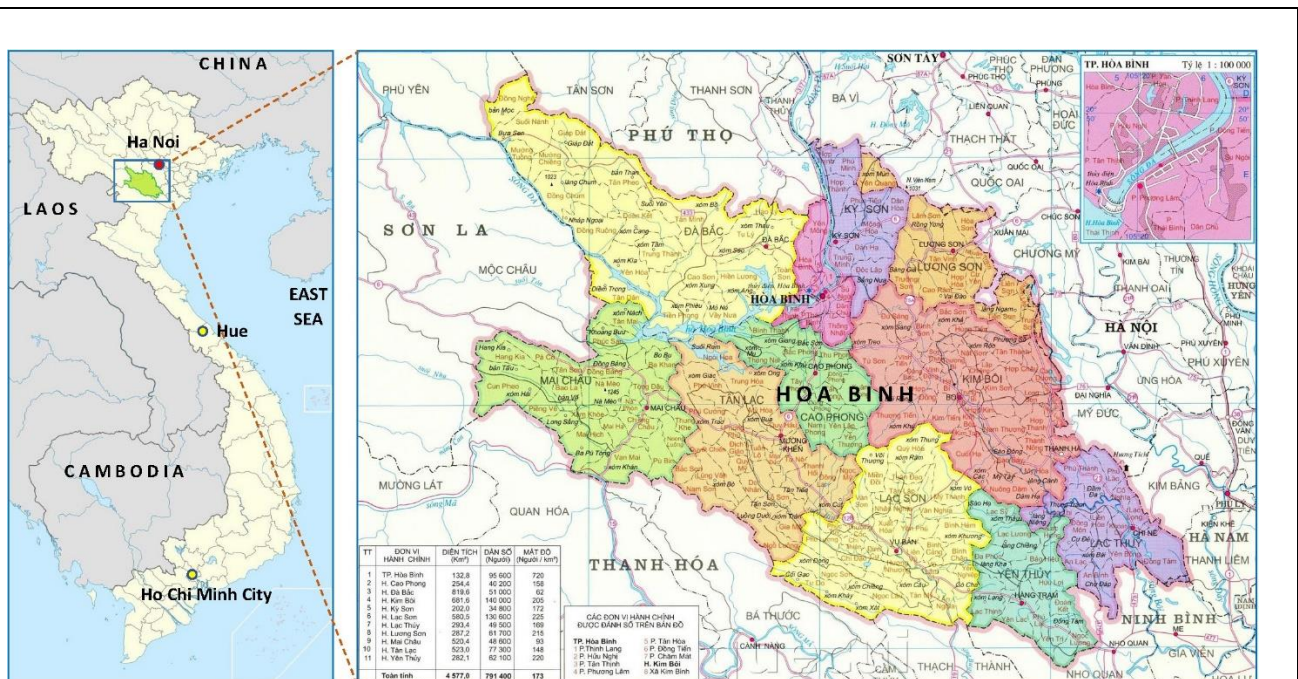


Figure 1. Map of Hoa Binh province

Hoa Binh is a mountainous province, located in the northwest of Viet Nam. The topography of the province is very complex, including high and steep mountains, alternated by narrow plains. The province has 141,615 ha of natural forests, but most is poor and degraded that urgently needs enrichment and improvement. Hoa Binh has a monsoon tropical climate, the average annual temperature is 23°C -24°C, annual rainfall is 1,500-2,000 mm. The population of Hoa Binh is 838,843 persons with the density of 49.43 persons/km². Hoa Binh has 07 ethnic groups living together, with their poor livelihood depends strongly on agriculture and forestry. In 2017, the RGDP of the province reached more than US\$ 1.66 billion, with the average income per capita was USD 1,959/capita. The economic structure of Hoa Binh is mainly contributed by industry-construction, services and agriculture. In 2017, the province had 1,795 enterprises, of which only 61 enterprises are manufacture of wood and wood products, employed 49,434 people with nearly 50% women.

3. Research Design and Methodology

(Explain how you will design the research as well as describe the tools, procedures, participants and sources of the research. When, where and how will you collect, select and analyze data? Each objective, as stated in Section A.3 should have a corresponding methodology)

Research design and methodology are as follows:

Objective 1: To assess the degraded natural forest status, forest enrichment models, techniques applied, and related policies in Hoa Binh province.

Methodology:

- Desk review: Existing research results and policies related to rehabilitation/enrichment of degraded natural forests in Hoa Binh province will be reviewed and assessed.
- Survey method: A survey team will organize interviews with relevant stakeholders using semi-structure and open questionnaires in Hoa Binh province. Interviews will be organized with managers, technical staff and people from province to commune level. The concerned topics are degraded natural forests and management, silvicultural methodology applied to rehabilitation models; knowledge of local people in terms of applying enrichment model using high valuable native species. Degraded natural forests and rehabilitation models in Hoa Binh province will also be assessed and measured to get useful data (type of degraded forest, planted species, growth, soil quality, techniques applied...). Meetings with various stakeholders will also be held to contribute to the findings of the field survey.
- Data analysis: Data and information will be analyzed by applying appropriate statistic programs like excel and SPSS.

Objective 2: To develop appropriate technical guideline in forest enrichment using high valuable native species in Hoa Binh province based on assessment results and information attained.

- Expert method is used to develop the technical guideline. Based on the data and information received from the assessment, an experienced expert is hired to develop the suitable guideline to enrich degraded natural forests using high valuable native species in

Hoa Binh province. Meetings with relevant stakeholders in Hoa Binh province are held to get comments and contribution to the technical guideline before it is applied into the real situation.

Objective 3: To organize technical trainings for relevant stakeholders in Hoa Binh province

- Relevant stakeholders, including but not limited to managers, technicians, forest rangers, local authorities, social agencies, representatives of communities, and households will be participated in technical trainings on forest enrichment using high valuable native species and related issues.

Objective 4: To build the demonstration plots using the technical guideline

- 02 ha of demonstration model of enrichment using high valuable native species will be established in Hoa Binh province. At first, the project team will visit and discuss with Hoa Binh authorities and local people and select suitable sites for the model establishment. The site will then be designed and built, based on the technical guideline developed. Around 5 high valuable native species will be selected for the model establishment, based on the previous assessment results. Local communities and households will have opportunity to discuss the site for the models, species and techniques for planting and tending, and also to participate in planting, tending and protecting stages.

Section C: Implications and contributions to current body of knowledge

1. Expected Outcomes and Outputs

(Provide the list of deliverables of the research project: Publications, scientific research papers, number of events/trainings organized, patents, etc.)

- 01 report to assess degraded natural forests, forest enrichment models, techniques applied, and related policies in Hoa Binh province;
- 01 technical guideline to enrich degraded natural forests using high valuable native species in Hoa Binh province;
- 04 technical trainings on forest enrichment using high valuable native species
- 02 ha of demonstration enrichment models using high valuable native species
- 02 scientific research papers
- Inception report, final report and other technical reports.

2. Practical Implications

(How will your findings help improve a process, inform policy, or make a case for concrete change?)

The research project will enhance knowledge and skills in forest enrichment using high valuable native species for the forest owners, local people, local researchers/officials through meetings, workshops and trainings;

The research project outcomes will help to improve awareness and knowledge on rehabilitation of degraded natural forests by applying enrichment techniques using high valuable native species. Technical guideline and training documents will be transferred to local farmers and local agricultural extension so as that they can themselves apply for similar conditions after the research

project is completed. The experiment plots will be maintained even after the termination of the project to get further data and information to enhance the technical guideline, and in turn the enhanced technical guideline will contribute to the improvement of degraded natural forests and the livelihood of local people in Hoa Binh province and the Northwest.

3. Theoretical Implications

(Will your work help strengthen a theory or model, challenge current assumptions, or create a basis for further research?)

Degraded natural forest is a serious problem in Hoa Binh province in specific and in Viet Nam in general. To deal with this problem, it needs a huge financial support and labor, and also for a long time. With support from NIFoS, the project will focus on understanding the nature of the problems, synthesize the research results, assess the rehabilitation models and deal with the most serious one by generating a suitable guideline, building demonstration model and training relevant stakeholders. The techniques applied, the species enriched and the site selected will be discussed widely among relevant stakeholders, from the provincial level to households. The project will also attain consultation in terms of techniques and measurement for enrichment and other rehabilitation methods from NIFoS. The project will also invite NIFoS experts to join the field trip, workshop and also to develop the technical guideline and the demonstration models. The project will play as an excellent demonstration model to rehabilitate and improve degraded natural forests for other places and regions to learn and apply.

After the termination of the project (with two years), the experiment models will be assigned to local authority and people to maintain and protect, so that useful data and information will be attained from the models to help enhance the demonstration models and the technical guideline. In turn, the enhanced technical guideline and the maintained models will help improve the knowledge and quality of technical trainings on forest enrichment using high native valuable species in Hoa Binh province and the Northwest.

Section D. Research Budget of Objectives/Outputs/Activities

1. Work Plan and Schedule

Outputs	Performance Indicator	Responsible person/body	Annual timeline							Remarks	
			2021			2022			2023		
			Q2	Q3	Q4	Q1	Q2	Q3	Q4		Q1
Objective 1: To assess the degraded natural forest status, forest enrichment models, techniques applied, and related policies in Hoa Binh province											
Output 1: Assessment of the degraded natural forest status, forest enrichment models, techniques applied, and related policies in Hoa Binh province											
<i>Act 1.1: Assess the degraded natural forest status, forest enrichment models, techniques applied, and related policies in Hoa Binh province</i>	<i>Survey report, journal article</i>	Research team									
Objective 2: To develop appropriate technical guideline in forest enrichment using high valuable native species in Hoa Binh province based on assessment results and information attained											
Output 2: Development of appropriate technical guideline in forest enrichment using high valuable native species in Hoa Binh province based on assessment results and information attained											
<i>Ac 2.1: Generate technical guideline in forest enrichment using high valuable native species in Hoa Binh province based on survey results and information attained</i>	technical guideline	Research team									
<i>Act 2.2: Organize meeting to get comments on the draft of technical guideline</i>	meeting	Research team									
<i>Act 2.3: Revise the draft of technical guideline following comments</i>	revised guideline	Research team									
Objective 3: To organize technical trainings for relevant stakeholders in Hoa Binh province											
Output 3: Organization of technical trainings for relevant stakeholders in Hoa Binh province (2 days/training, 30 participants)											
<i>Act 3.1: Generate the training curriculum based on the technical guideline</i>	curriculum	Research team									
<i>Act 3.2: Organize technical trainings for relevant stakeholders in Hoa Binh province</i>	training	Research team									

Outputs	Performance	Responsible	Annual timeline						Remarks	
Objective 4: To develop the demonstration plots using the technical guideline										
Output 4: Development of demonstration plots using the technical guideline										
<i>Act 4.1: Select suitable site and design the model</i>	Model design	Research team								
<i>Act 4.2: Develop 2 ha of demonstration models</i>	2 ha model	Research team								

2. Budget plan

Order	Objective/ Output/ Activity	Unit	Unit Cost (USD)	Quantity	Total Cost (USD)	Yearly budget (USD)							
						2021			2022				2023
						Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
Objective 1	To assess the degraded natural forest status, forest enrichment models, techniques applied, and related policies in Hoa Binh province				7,955	7,955							
Output 1	Assessment of the degraded natural forest status, forest enrichment models, techniques applied, and related policies in Hoa Binh province				7,955	7,955							
<i>Act 1.1</i>	<i>Assess the degraded natural forest status, forest enrichment models, techniques applied, and related policies in Hoa Binh province</i>				7,955	7,955							
1.1.1	DSA for 5 staff, 16 days each	day	35	80	2,800	2,800							
1.1.2	Lodging for 5 staff, 15 nights each	night	35	75	2,625	2,625							
1.1.3	Assist participants attending meeting to comment on the survey findings (1 day)	person	35	22	770	770							
1.1.4	Car hiring	day	110	16	1,760	1,760							

Order	Objective/ Output/ Activity	Unit	Unit Cost (USD)	Quantity	Total Cost (USD)	Yearly budget (USD)							
						2021		2022			2023		
Objective 2	To develop appropriate technical guideline in forest enrichment using high valuable native species in Hoa Binh province based survey results and information attained				2,690		2,690						
Output 2	Development of appropriate technical guideline in forest enrichment using high valuable native species in Hoa Binh province based on survey results and information attained				2,690		2,690						
Act 2.1	<i>Generate technical guideline in forest enrichment using high valuable native species in Hoa Binh province based on survey results and information attained</i>				840		840						
2.1.1	DSA for 3 staff, 8 days each	day	35	24	840		840						
Act 2.2	<i>Organize meeting to get comments on the draft of technical guideline</i>				1,625		1,625						
2.2.1	DSA for 3 staff, 3 days each	day	35	9	315		315						
2.2.2	Lodging for 3 staff, 2 nights each	night	35	6	210		210						
2.2.3	Assist participants attending meetings to comment on the survey findings in Hoa Binh province (1 day)	person	35	22	770		770						
2.2.4	Car hiring	day	110	3	330		330						
Act 2.3	<i>Revise the draft of technical guideline following comments</i>				225		225						
2.3.1	DSA for 2 staff, 3 days each	day	35	6	210		210						
2.3.2	Stationery, printing, copying, etc.				15		15						
Objective 3	To organize technical trainings for relevant stakeholders in Hoa Binh province				12,560		3,665	2,965		2,965			2,965

Order	Objective/ Output/ Activity	Unit	Unit Cost (USD)	Quantity	Total Cost (USD)	Yearly budget (USD)							
						2021		2022			2023		
Output 3	Organization of technical trainings for relevant stakeholders in Hoa Binh province (2 days/training, 30 participants)				12,560			3,665	2,965		2,965		2,965
Act 3.1	Generate the training curriculum based on the technical guideline				700			700					
3.1.1	DSA for 2 staff, 10 days each	day	35	20	700			700					
Act 3.2	Organize technical trainings for relevant stakeholders in Hoa Binh province	training	2,965	4	11,860			2,965	2,965		2,965		2,965
3.2.1	DSA for 3 staff, 3 days each	day	35	36	1,260			315	315		315		315
3.2.2	Lodging for 3 staff, 2 nights each	night	35	24	840			210	210		210		210
3.2.3	Assist participants to attend trainings (2 days, 30 participants/training)	day	35	240	8,400			2,100	2,100		2,100		2,100
3.2.4	Car hiring	day	110	12	1,320			330	330		330		330
3.2.5	Stationery, printing, copying, etc.				40			10	10		10		10
Objective 4	To develop the demonstration plots using the technical guideline				7,595				1,495	6,100			
Output 4	Development of demonstration plots using the technical guideline				7,595				1,495	6,100			
Act 4.1	Select suitable site and design the model				1,175				1,175				
4.1.1	DSA for 3 staff, 4 days each	day	35	12	420				420				
4.1.2	Lodging for 3 staff, 3 nights each	night	35	9	315				315				
4.1.3	Car hiring	day	110	4	440				440				
Act 4.2	Develop 2 ha of demonstration models	ha	3,050	2	6,100					6,100			
4.2.1	Native seedlings (500 seedlings/ha)	seedling	1.5	1,000	1,500					1,500			
4.2.2	Labour to clear the site (1 ha)	man-day	30	20	600					600			
4.2.3	Labour to dig hole (500 holes/ha)	man-day	30	16	480					480			

Order	Objective/ Output/ Activity	Unit	Unit Cost (USD)	Quantity	Total Cost (USD)	Yearly budget (USD)							
						2021			2022			2023	
4.2.4	NPK (0.2kg/hole), including transportation	kg	0.6	200	120					120			
4.2.5	Labour to plant trees (1 ha)	man-day	30	18	540					540			
4.2.6	DSA for 2 staff, 6 days each	day	35	24	840					840			
4.2.7	Lodging for 2 staff, 5 nights each	night	35	20	700					700			
4.2.8	Car hiring	day	110	12	1,320					1,320			
	Sub-total (Objectives 1-4) (I)				30,800	7,955	2,690	3,665	4,460	6,100	2,965		2,965
	Annual Sub-total (Objectives 1-4)				30,800	14,310			13,525			2,965	
	Program Support (12% of subtotal) (II) Financial Regulation 3.4				3,696								
	Total I + II				34,496								

3. National Contribution (in-kind)

Order	Contribution type	Unit	Unit cost (USD)	Quantity	Total cost	Remark
1	Office and office equipment for operation the research project (24 months)	month	170	24	4,080	
2	Tending and protection of 2 ha of demonstration model for 2 years (2022 and 2023)	year	460	2	920	
	Total				5,000	

Section E. Research Team Members Information

1. Research Leader

- Personal Information

Name	Bui Trong Thuy	Date of birth	15/07/1976
Position	Deputy Director of Forest Science Centre of North-Eastern Viet Nam		
Contact Information	Ngoc Thanh commune, Phuc Yen town, Vinh Phuc province, Viet Nam	Tel: Fax:	+84 211 3856022 +84 211 3856061
Work Description	Manage and direct the implementation of activities in the fields of science and technology in silviculture, forest rehabilitation and enrichment, technology transfer on forestry; manage and direct: Department of Silviculture; Department of Applied Research, Technology Transfer and Forest Protection and Management in forestry.		

- Education (starting from college to highest Degree earned)

Years (From ~ To)	Education	Major	Degree
2000-2004	Higher education in Viet Nam Forestry University	Silviculture	Bachelor
2008-2010	Post-graduate in Thai Nguyen University for Agriculture and Forestry	Silviculture	Master
2012-2018	Post-graduate in Vietnamese Academy of Forest Sciences	Silviculture	Doctor

- Work Experience (for the last 3 years)

Years (From ~ To)	Institution	Position	Other
06/2017-present	Forest Science Centre of North-Eastern Viet Nam	Deputy Director	

- Related Research Achievement (with relevance to the research proposal)

a) Report/Publication

Title	Content
Viet Nam Journal of Forest Science	Results of growth assessment of some indigenous broadleaf tree species planted under the canopy of Thong Ma Vi (<i>Pinus massoniana</i> Lamb) and Thong Nhua (<i>Pinus merkusii</i>) in Dai Lai - Vinh Phuc.
Research results of	Research on intensive afforestation techniques for <i>Pinus Caribaea</i> Morelet

forestry science and technology in the 2006-2010 period	supplying big timber
Viet Nam Journal of Forest Science	Results of the experiment to expand imported trees (Eucalyptus, Pine, Acacia) in the highlands of some Northern mountainous provinces
Viet Nam Journal of Forest Science	Evaluation of growth of some indigenous tree species in forest planting and enrichment models in the highlands of some northern mountainous provinces.

b) Research Work/Projects Involvement

Research Work/Projects	Nature of Involvement	Important Remarks
National level research	Research manager	Research on conservation and development of genetic resources of Bach Vang (<i>Xanthocyparis vietnamensis</i> Parjon & N.T.Hiep) in some Northern mountainous provinces
AFoCo Project (PP-2018-VN-001)	Project manager	Improving <i>Pinus Caribaea</i> Morelet for Plantation on Degraded Land in Viet Nam's Northern Mountainous Region"
Research	Head	Extensive testing of some prospected species and its forest planting techniques in the highlands of the Northern Viet Nam
Research on techniques to plant Mau cho la to (<i>Knema pierrei</i> Warb), Cho xanh (<i>Terminalia myriocarpa</i> Huerch), and De xanh (<i>Lithocarpus pseudosundaicus</i> H&C) providing big timber for the Northern region.	Head	Conduct to implement some activities in the fields and writing the report related to the design, plan of the research
Research : Developing High Valuable Species in Viet Nam and Thailand as the Mechanism for Sustainable Forest Management and Livelihood Improvement for Local Communities. Donor: AFoCO and KFS	Head	Implementation of the activities: surveys, meetings, workshops; established demonstration models in rural province; Organize technical trainings and site visits for local people.
Research on breeding and planting techniques for intensive afforestation of Soi phang (<i>Lithocarpus fissus</i> (Champ. Ex Benth.) A.Camus), Gáo trắng (<i>Neolamarckia cadamba</i> (Roxb.) Bosser)	Head	Implement some activities in the fields and writing the report related to the design, plan of the research

providing big timber for some key areas.		
Extensive testing of some prospected species and its forest planting techniques in the highlands of the Northern Viet Nam	Head	Implement some activities in the fields and writing the report related to the design, plan of the research

2. Other Research Team Members (all members should be listed: add addition pages with the same format as required)

Team Member 1

- Personal Information

Name	Pham Duc Chien	Date of birth	15/09/1967
Position	Senior researcher Vietnamese Academy of Forest Sciences		
Contact Information	Address: Duc Thang Ward, Bac Tu Liem District, Ha Noi City, Viet Nam	Tel: Fax:	+84.912.563.783 +84 2438389722
Work Description	Management (establishment, monitoring and evaluation) of international programs and projects of the Academy; Implement assigned international programs, projects and assignments; Team leader to develop new international programs, projects and partnerships; Conduct technical transfer and training services. 25 years of solid experience on forest rehabilitation and afforestation, community forestry and development, biodiversity conservation and ecotourism, landscape management and climate change adaptation.		

- Education (starting from college to highest Degree earned)

Years (From ~ To)	Education	Major	Degree
1989-1994	Under-graduate, Viet Nam Forestry University	Silviculture	Bachelor
1999-2000	Post-graduate, University of Queensland, Australia	Natural Resource Studies	Master
2003-2006	Post-graduate, Utrecht University, the Netherlands	Plant ecology and biodiversity conservation	PhD

- Work Experience (for the last 3 years)

Years (From ~ To)	Institution	Position	Other

2018-Now	Vietnamese Academy of Forest Sciences (VAFS).	Deputy Director/Senior Researcher	
2013 – 2018	Vietnamese Academy of Forest Sciences (VAFS)	Deputy Director/Senior Researcher	

- Related Research Achievement (with relevance to the research proposal)

a) Report/Publication

Title	Content
Journal of Agriculture and Rural Development	Technical procedure for planting <i>Pinus caribaea</i> in Viet Nam. In Technical Procedure Documents of Silviculture.
Viet Nam Journal of Forest Science	Plantation rotation of Eucalyptus spp and Acacia spp to improve soil and plantation productivities.
Article, Workshop proceedings	Forest Rehabilitation in Vietnam since 1975 and Future Challenges. In the Proceeding of the International Symposium on Reclamation, Rehabilitation and Restoration towards a Greener ASIA, held in Kuala Lumpur, Malaysia from 3-5 July 2012.
PhD thesis, Utrecht University	Demography of threatened tree species in Viet Nam.
Population Ecology 50: 227-237.	Conservation prospects for threatened Vietnamese tree species: results from a demographic study.
Article, workshop proceedings	Plantation forest rotation of Eucalyptus and Acacia to improve soil and plantation productivity. Conference Proceeding of the Forest Science Institute of Viet Nam
Viet Nam Journal of Forest Science	Planting techniques for some native species under the Pine and degraded natural forests.
Center for International Forestry Research (CIFOR). ISBN: 978-602-387-122-3	Opportunities and challenges for mangrove management in Viet Nam: Lessons learned from Thanh Hoa, Thai Binh and Quang Ninh provinces
Journal of Agriculture and Rural Development, Volume 2: 125-129, 2018	Effects of collecting time of seeds on seed quality and shading mechanisms, seedling bag components on seedling growth of <i>Terminalia myriocarpa</i> in nursery.
Journal of Ecology 98: 345-355.	Integral Projection Models for trees: a new parameterization method and a validation of model output.
Trees - Structure and	Ages and long-term growth patterns of four threatened Vietnamese tree

Function 25: 29-38.	species.
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b) Research Work/Projects Involvement

Research Work/Projects	Nature of Involvement	Important Remarks
<p>International Training Course: Development of AFoCO Project Proposal, held in Regional Education and Training Center, Yangon, Myanmar Donor: AFoCO</p>	International Expert/trainer	In collaboration with other international experts to conduct the International Training course on Development of AFoCO Project Proposal for AFoCO member countries.
<p>International Assignment: To organize the “Trainers in Forestry Network (TIF) Study Tour on Community Forestry” in Viet Nam for APFNet member countries. Donor: APFNet</p>	National Coordinator	In collaboration with APFNet staffs to communicate with relevant agencies and people, coordinate and conduct the Study Tour on community forestry of Viet Nam for APFNet trainer experts in both indoor sessions and field trip in Ha Noi City, Hoa Binh Province and Phu Tho Province, Viet Nam.
<p>International Assignment: Research on opportunities and challenges for mangrove management in Viet Nam: Lessons learned from Thanh Hoa, Thai Binh and Quang Ninh provinces Donor: CIFOR and USAID</p>	Group Leader	In charge to organize surveys, interviews, meetings, workshops to assess the impact of Eco-tourism and other factors on the sustainable wetlands management in Viet Nam.
<p>Midterm evaluation of the project: Conservation of Critical Wetland Protected Areas and Linked Landscapes Donor: UNDP and GEF</p>	National Consultant	In collaboration with an international consultant to conduct surveys, interviews of relevant stakeholders in Ha Noi, Thai Binh and Thua Thien Hue provinces. Analysed data and information, and wrote reports for the donor.
<p>Research Project: Research on traditional knowledge of ethnic minorities in the North of Viet Nam on forest protection and conservation Donor: APAFRI and KFRI</p>	Team leader	In charge to organize and implement the research, collect and analyse data and write report and present the result in the international conference.
<p>Project: Forest Protection and</p>	PMU Director	In charge to manage and implement the

Development for Watershed of Hoa Binh Lake and Da River, Environment research and Experiment Centre Donor: MARD		activities of the project dealing with afforestation and rehabilitation of the degraded forest and land of the area, and to establish and conduct eco-tourism using the landscape of the lake, forest and ethnic villages.
Implementation of the Project: “Developing Non-timber Forest Products (NTFPs) in the Northwest of Viet Nam as the Mechanism for Sustainable Forest Management, biodiversity conservation and Livelihood Improvement for Local Communities”. Donor: AFoCo	Team Leader	Worked closely with provinces of the Northwest of Viet Nam (Hoa Binh, Son La, Dien Bien and Lai Chau provinces) and various organizations and stakeholders. Carried out survey, interviews and meetings regarding status and indigenous techniques to grow, maintain, tend, harvest, preserve and process NTFPs in the region. Prepared reports and organized meetings,

Team Member 2

- Personal Information

Name	Nguyen Duy Bien	Date of birth	02/07/1975
Position	Researcher of Forest Science Centre of North-Eastern Viet Nam		
Contact Information	Ngoc Thanh commune, Phuc Yen town, Vinh Phuc province, Viet Nam	Tel: Fax:	+84 211 3856022 +84 211 3856061
Work Description	Implement of activities in the fields of science and technology in silviculture, forest rehabilitation and enrichment, technology transfer on forestry; manage and direct		

- Education (starting from college to highest Degree earned)

Years (From ~ To)	Education	Major	Degree
1994-1999	Under-graduate, Viet Nam Forestry University	Silviculture	Bachelor
2013-2015	Post-graduate Viet Nam Forestry University	Silviculture	Master

- Work Experience (for the last 3 years)

Years (From ~ To)	Institution	Position	Other
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05/2013 - Now	Researcher of Forest Science Centre of North-Eastern Viet Nam	Researcher	
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- Related Research Achievement (with relevance to the research proposal)

a) Report/Publication

Title	Content
Viet Nam Journal of Forest Science	Plantation rotation of Eucalyptus spp and Acacia spp to improve soil and plantation productivities.
Report	Forest Rehabilitation in Vietnam since 1975 and Future Challenges. In the Proceeding of the International Symposium on Reclamation, Rehabilitation and Restoration towards a Greener ASIA, held in Kuala Lumpur, Malaysia from 3-5 July 2012.
Report	Plantation forest rotation of Eucalyptus and Acacia to improve soil and plantation productivity. Conference Proceeding of the Forest Science Institute of Viet Nam
Viet Nam Journal of Forest Science	Planting techniques for some native species under the Pine and degraded natural forests.

b) Research Work/Projects Involvement

Research Work/Projects	Nature of Involvement	Important Remarks
Research on techniques to plant Mau cho la to (<i>Knema pierrei</i> Warb), Cho xanh (<i>Terminalia myriocarpa</i> Huerch), and De xanh (<i>Lithocarpus pseudosundaicus</i> H&C) providing big timber for the Northern region.	Collaborator	Implement some activities in the fields and writing the report related to the design, plan of the research
AFoCO Regional Project: Developing High Valuable Species in Viet Nam and Thailand as the Mechanism for Sustainable Forest Management and Livelihood Improvement for Local Communities. Donor: AFoCO and KFS	Collaborator	Implementation of the activities: surveys, meetings, workshops; established demonstration models in rural province; Organize technical trainings and site visits for local people.
Research on breeding and planting techniques for intensive afforestation of Soi phang (<i>Lithocarpus fissus</i> (Champ. Ex Benth.) A.Camus), Gáo trắng (<i>Neolamarckia cadamba</i> (Roxb.)	Collaborator	Implement some activities in the fields and writing the report related to the design, plan of the research

Bosser) providing big timber for some key areas.		
Extensive testing of some prospected species and its forest planting techniques in the highlands of the Northern Viet Nam	Collaborator	Implement some activities in the fields and writing the report related to the design, plan of the research