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Sustainable Forest Management in Northwest of Vietnam Project (JICA3)

Summary report on:

THE SOCIO-ECONOMIC SURVEY

IN FOUR TARGET PROVINCES

(HOA BINH, SON LA, DIEN BIEN AND LAI CHAU

PROVINCES"

July, 2016

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I. INTRODUCTION

1.1 Objectives of the survey

The Japan International Cooperation Agency (hereinafter referred to as JICA) and the Government of Vietnam agreed on the conduct of captioned preparatory survey targeting four (4) provinces, namely Lai Chau, Dien Bien, Son La and Hoa Binh between March and August 2016 to prepare an implementation plan for a new loan project on sustainable forest development and management in the Northwestern sub-region in Vietnam.

In order to select potential project communes/areas properly and formulate a down-to-earth project plan, a captioned survey was carried out to grasp the characteristics of current socio-economic conditions in 12 selected communes of four provinces (three communes in each province) for clarifying the rural/livelihood development in need for minimizing human pressure on the forest resources as well as identifying the key drivers of deforestation. The survey specifically aimed to find out:

1) Socio economic conditions in 12 selected communes (including ethnicity, demography, social status, well-being, land use, economic condition, characterization of the poor/marginalized/economically vulnerable groups in the target communes etc.);
2) Key stakeholders influencing land and forest use and conduct a basic stakeholder analysis;
3) Key drivers of deforestation and forest degradation as well as the underlying drivers of these trends (human pressure on forest resources; identify the human activities which have caused deforestation and forest degradation; current forest management and development activities);
4) Gender differences in the use of natural resources and other livelihood activities;
5) Any potential social issues which may result from strengthened forest conservation, protection and development activities and the necessary actions to minimize adverse effects on socio economic conditions of the poor or economically vulnerable people that are heavily dependent on forest resources; and,
6) Development needs among male and female groups in the target communes (including necessary intervention for the better forest management).

1.2 Survey target communes and villages

The survey was carried out in 12 different communes of 12 districts in Hoa Binh, Son La, Dien Bien and Lai Chau provinces. Prior to the survey, JICA consultants have discussed with provincial leaders in the each province to introduce about the need of the survey and come to an agreement on 3 communes in three different districts. There are including Ngoc Lau, Tien Phong and Pa Co communes of Hoa Binh province; Muong Giang, Chieng Xuan and Ban Lam communes of Son La province; Muong Nha, Ta Ma and Muong Tung communes of Dien Bien province; and Nam So, Pa Mu and Phang So Lin communes of Lai Chau province.

The survey team has visited the 12 proposed communes to discuss with commune leaders about the proposed project, as well as to explain clearly nature, objectives, target subjects and timeframe of the survey. The teams have also discussed and selected one village for an in-depth survey applying PRA in each commune. Selection of the villages was based on the following conditions:

- Have barren hill land area at medium scale;
- Accessible for car even in heavy rainy season;
- Forest protection has been at medium quality;
- People living in the village must represent for major ethnic in the commune;
- Villagers must be supportive and willing to take part in development project;
- Village leaders shall be supportive and have solid management capacity;
- Have both protection and production forest at medium scale.

These conditions were flexible depending on particular situation in each commune, and commune leaders have full authority to suggest the village they believe the best-meet with the proposed conditions. As a result, the following communes and villages were selected as the target for the survey.

Table 1: Surveyed communes and villages

No	District	Commune	Village	Forest Management Board
【Dien Bien Province】				
1	Dien Bien District	Mường Nhà commune	Xom village	Dien Bien PFMB
2	Tuan Giao District	Ta Ma commune	Na Dang village	Tuan Giao PFMB
3	Muong Cha District	Mường Tùng commune	Moi village	Muong Cha PFMB
【Lai Chau Province】				
4	Tan Uyen District	Nậm Sỏ commune	Nam Danh village	Tan Uyen PFMB
5	Sin Ho District	Phan Xu Lin commune	To Lo Phin village	Nam Ma PFMB
6	Than Uyen District	Pha Mu commune	Huoi Bac village	Than Uyen PFMB
【Son La Province】				
7	Thuan Chau district	Ban Lam comune	Bam Lam A village	Thuan Chau PFMB
8	Quynh Nhai district	Muong Giang commune	Pa Uon village	Quynh Nhai PFMB
9	Van Ho district	Chieng Xuan commune	Dup Ken village	Xuan Nha SUFMB
【Hoa Binh Province】				
10	Lac Son district	Ngoc Lau commune	Xom Den village	Nac Son-Ngoc Son SUFMB
11	Mai Chau district	Pa Co commune	Sa Ling village	Hang Kia-PC SUFMB
12	Da Bac district	Tien Phong commune	Xom dien village	DRW-PFMB

1.3 Survey methodology

The survey was qualitative oriented combining with secondary data collection at commune and village levels. The key approach was PRA meetings with both local leaders and local people. The team paid two visits in each commune. In the first visit, the team briefly introduced local leaders with basic information about the proposed project and the survey as well as explained clearly nature, objectives, target subjects and timeframe of the survey. Basic socio-economic information and forest condition of the commune was collected. The team asked commune leaders for their agreement about the second visit, which would be three days later. In the first half day of the second visit, the survey team had a meeting with all villager chairpersons in the commune and key representatives from CPC. A checklist of requested information was prepared and passed to every village leader in the first visit so as people would have time to provide all requested data and information in the checklist. In this meeting, before collecting the checklists, the survey team also briefly introduced participants with basic information about the proposed project and the survey as well as explained clearly nature, objectives, target subjects and timeframe of the survey. It was followed by quick interviews and discussions about socio-economic situations of each village. This meeting lasted for about 2 hours and a half excluding 30 minutes for coffee break.

The team spent one day and a half in the selected village that had been proposed by CPC in

the first meeting. There were 4 meetings organized in the village that described as followed:

- The first meeting was with all village leaders, aiming to gather comprehensive socio-economic and background of the village including but not limit to population, ethnicity, poverty rate, land use, income source, forest management, etc.
- The second meeting was with 40-50 people in the village representing for gender, economic status, age and occupational background. In this meeting, the team and the people worked together to map out village landscape including land use, forest management. People were also asked to explain about the changes related to their landscape and their forest over the last 5 years. Participants were also asked to describe the difference among 4 different economic background household including the better off, the medium, the near poor and the poor. This exercise aimed to collect local definition about each certain economic situation and its meaning in local context.
- The third meeting was with 20-25 women who were asked to describe and to explain their forest resource ranking. It was followed with asking people about forest degradation driver raking. This exercise's last activity was asking people to rank livelihood activities they believed would have positive impacts on their lives, and would reduce their dependency on forest.
- The fourth meeting was with 20-25 men, who were asked to describe and to explain their forest resource ranking. It was followed with asking people about forest degradation driver raking. This exercise's last activity was asking people to rank livelihood activities they believed would have positive impacts on their lives, and would reduce their dependency on forest.

1.4 Organization of the survey team

The survey team consisted of 9 people, including one team leader, one vice team leader, three key facilitators and four assistants. The survey team consisted of team leader of the survey team, one key facilitator and one assistant. The team leader has twenty two years working with socio-economic survey, community and livelihood development plan, and forest policy development for a large number of projects supported by international donors in Vietnam in general and the north upland region in particularly. The vice facilitator has 18 years of carrying both qualitatively and quantitatively socio-economic surveys in Vietnam with solid understanding about ethnic minority people. He has also taken part in JICA previous projects. Other three key facilitators have had ten years working with qualitatively and quantitatively socio-economic surveys in different projects. They also have good knowledge on forest management situation in the north upland region of Vietnam. Four facilitators are high educated people and good working experiences with qualitative survey and with ethnic minority people in Lai Chau, Dien Bien, Son La and Hoa Binh province. List of members of survey team and their field sites are given in the table below.

Sub-team in charge of survey works in each province consisted of the team leader, one key facilitator and one assistant. Team leader was responsible for designing the survey method, guideline for PRA, tables for collecting secondary data, questionnaires for key informants interview, working schedule, advance contact with the communes and villages and report revision. The key facilitator was responsible for leading the survey including all PRA discussions, on- site activities management and report writing. Meanwhile, the assistant worked with logistic supports, secondary data collection and note-taking during PRA meetings.

Table 2: List of members of survey team and their survey site

No	Name of consultant	Position	Sub-team arrangement	Survey site
1	Le Quang Trung	Team leader		Lai Chau, Dien Bien, Son La and Hoa Binh
2	Nguyen Cong Thao	Vice team leader and key facilitator	Sub-team 1	Hoa Binh and Son La
3	Duong Minh Lam	Key facilitator	Sub-team 2	Dien Bien
4	Ha Van Tiep	Key facilitator	Sub-team 3	Son La
5	Nguyen Trung Kien	Key facilitator	Sub-team 4	Lai Chau
6	Do Thi Thanh Duong	Assistant	Sub-team 2	Dien Bien
7	Dang Quang Hung	Assistant	Sub-team 4	Lai Chau
8	Ngo Si Minh	Assistant	Sub-team 1	Hoa Binh
9	Nguyen Hong Quang	Assistant	Sub-team 3	Son La

1.5 Overall schedule and program

The survey was carried out in during 4th to 27th of May in 2016 with three allocated days for each commune including transportation time.

Table 3: Working schedule in Hoa Binh, Dien Bien, Son La and Lai Chau provinces

Date	Place	Activities	Participants
Sub-team 1 (May 8th-18th, 2016) in Hoa Binh province			
May 8th		Travel to Hoa Binh	
May 9th	Ngoc Lau commune	Advanced meeting	Commune leaders
May 10th	Pa Co commune	Advanced meeting	Commune leaders
May 11th	Tien Phong commune	Advanced meeting	Commune leaders
May 12th	Ngoc Lau commune	Socio-economic survey of each village	Commune leaders and village chairpersons
	Den village	Focus group discussion	Den village leaders
May 13th	Den village	PRA	Villagers
May 14th	Pa Co commune	Socio-economic survey of each village	Commune leaders and village chairpersons
	Xa Linh village	Focus group discussion	Village leaders
May 15th	Xa Linh village	PRA	Villagers
May 16th	Tien Phong commune	Socio-economic survey of each village	Commune leaders and village chairpersons
	Dieng village	Focus group discussion	Village leaders
May 17th	Dieng village	PRA	Villagers
Sub-team 2 (May 4th-14th, 2016) in Dien Bien province			
May 3rd		Travel to Dien Bien	
May 4th	Muong Nha commune	Advanced meeting	Key commune officials
	Pu Lau village	Advanced meeting	Village leaders
May 5th	Ta Ma commune	Advanced meeting	Key commune officials
	Na Dang village	Advanced meeting	Village leaders
May 6th	Muong Tung commune	Advanced meeting	Key commune officials
	Moi village	Advanced meeting	Village leaders
May 9th	Muong Nha commune	Focus group discussion	Key informants
	Xom village	Focus group discussion	Representatives of village
May 10th	Xom village	PRA	Villagers
May 11th	Ta Ma commune	Focus group discussion	Key informants
	Na Dang village	Focus group discussion	Representatives of the village
May 12th	Na Dang village	PRA	Villagers
May 13th	Muong Tung commune	Focus group discussion	Key informants
May 14th	Moi village	PRA	Villagers
Sub-team 3 (May 4th-15th, 2016) in Son La province			
May 3rd		Travel to Son La	
May 4th	Ban Lam commune	Advanced meeting	Commune leaders
	Tang village	Focus group discussion	Village leaders and key farmers
May 5th	Muong Giang commune	Advanced meeting	Commune leaders
	Pa Uon village	Focus group discussion	Village leaders
May 6th	Chieng Xuan commune	Advanced meeting	Commune leaders, key officers
	Dup Ken village	Focus group discussion	Village leaders
May 9th	Muong Giang commune	Group discussion meeting	Key officials and leaders of

Date	Place	Activities	Participants
			villages
	Pa Uon village	Group discussion meeting	Village leaders and key farmers
May 10th	Pa Uon village	PRA	Villagers
May 11th	Chieng Xuan commune	Focus group discussion	Key commune officials and all village leaders
May 12th	Dup Ken village	PRA	Villagers
May 13th	Ban Lam commune	Advanced meeting	Key commune officials
	Lam A village	Preparation meeting	Village leaders
May 14th	Ban Lam commune	Group discussion meeting	Key commune officials and all leaders of villages
	Lam A village	Focus group discussion	Key Villagers
May 15th	Lam A village	PRA	Villagers
Sub-Team 4 (May 12th -27th, 2016) in Lai Chau province			
May 11th		Travel to Lai Chau	
May 12th	Nam So commune	Advanced meeting	Communal officials and 21 village heads
	Nam Danh village	Focus group discussion	Village representative
May 13th	Nam Danh village	PRA	Villagers
May 14th	Hotel	Data entry	Team members
May 15th	Hotel	Data entry	Team members
May 16th	Pha Mu commune	Advanced meeting	Communal officials and 5 village heads
	Huoi Bac village	Preparation meeting	Village representative
May 17th	Huoi Bac village	PRA	Villagers
May 18th	Hotel	Data entry	Team members
May 19th	Hotel	Data entry	Team members
May 20th	Lo To Phin village	Focus group discussion	Village representative
	Lo To Phin village	PRA	Villagers
May 21st	Lo To Phin village	PRA	Villagers
May 27th	Phang So Lin commune	Focus group discussion	Communal officials and village leaders

II. KEY FINDINGS

2.1 Overview of the surveyed communes

The selected communes for socio-economic survey have natural characteristics and locations which are represented for the whole project target districts in for target provinces. Most of the surveyed commune are located remote area and extremely difficult (under the Program 135[1] of the Vietnam Government), except Muong Giang commune, Quynh Nhai District, Son La Province (Preparation survey for JICA3 project, 2016).

The geographical and natural condition is quite similar among 12 surveyed communes. It can be verified by some major indicators such as commune's location, road access condition, and distance to near market. Location of those communes is in the middle level with the distance to district center is on average over 30 km, except Muong Giang commune locates very near district center (3km). Except Pa Co commune (Hoa Binh) and Muong Giang commune (Son La), the rest of surveyed communes have their own road system ensuring traveling inner and outside commune by motorbike. However the quality of road is much different among those communes, the percentage of the land-pathway is dominant and hardly access in the rainy condition. For the distance to the near market, although there are only two communes in Hoa Binh province having their own market in commune, the distance from the village to the near

[1]135 program is supporting for the infrastructure investment and the production promotion of communes with special difficulties, communes in border areas, communes in safety zones and mountainous villages with special difficulties

market is on average 9 km; of which villages in Hoa Binh is nearest (average 4 km), then Lai Chau (6 km), Son La (8 km), and village in Dien Bien is farthest (15 km).

The natural land area of the surveyed communes are quite high and on average per commune about 8,836 ha (Pa Co commune is lowest area with 1,928 ha and Muong Tung is highest with 17,123 ha), in which the land area for forestry development proportion pretty, the results of survey showed that 11 communes in Hoa Binh, Son La, Dien Bien and Lai Chau provinces have forestry land area more than 40%. However, one representative commune of Lai Chau province assessed the percentage of forest land is low, due to the misinterpretation of the definition of the forest land and forestry land (the forestry land may including unused land because, that land area is planned for forest development purpose). Besides the area of forestry land, there are many surveyed communes who have land area for shifting cultivation such as upland rice, maize and cassava practices (see annex below). On the other hand, the gaps of cultivated land area between better off and poor household are still high (see annex below).

The average population of the surveyed communes are 3,882 people per commune (Pha Mu commune is lowest with 935 people and Muong Giang commune is highest with 10,398 people). The average population density of the surveyed commune is 60 people/km^2 (Pha Mu commune is lowest with only 8 people/km^2 and Muong Giang is highest with 148 people/km^2).

The surveyed communes have representatives of the popular ethnic groups in the Northwest region as the Thai, Hmong, Dzao, Muong, and Khang etc. Each ethnic group has its own culture, different farming practices, and livelihoods based on forest land and forest resources. For instance, the Hmong and Dzao people have the practice of shifting cultivation, while the Thai, Muong have the combination of wet paddy and shifting cultivation. The assessment results in 12 selected communes showed that the majority of the populations are ethnic minority groups, many hamlets have hundred percent of H'mong, Muong and Thai. For more specific, surveyed communes in Hoa Binh and Lai Chau province have 5 ethnic groups that dominated by Muong and H'mong ethnic respectively, meanwhile Son La and Dien Bien province have 7 ethnic groups dominated by Thai ethnic people. The survey result shows that the average number of households per commune is 900 households, the highest in Son La province with the average 1,378 households and the lowest in Hoa Binh province with the average 592 households per commune. The average population per commune entirely is 4,000 persons and it reflects the same trend with number of household, the highest in Son La (5,758 persons per commune) and the lowest in Hoa Binh (2,426 persons per commune).

Table 4: Ethnic Composition of the Surveyed communes

Province	District	Commune	Ethnic minorities (%)											Kinh (%)
			Thai	H'mong	Muong	Dao	Khu Mu	Khang	Lu	La Ha	Tay	Lao	Others	
Dien Bien	Muong Cha	Muong Tung	44	55										1
	Tuan Giao	Ta Ma		76				24						0
	Dien Bien	Muong Nha	37	43			2				1	15		1
Lai Chau	Sin Ho	Phang So Lin		17		82							0	1
	Tan Uyen	Nam So	70	24		4	1							1
	Than Uyen	Pha Mu	48	41										11
Son La	Quynh Nhai	Muong Giang	70	4				6		4				17

Province	District	Commune	Ethnic minorities (%)											Kinh (%)
			Thai	H'mong	Muong	Dao	Khu Mu	Khang	Lu	La Ha	Tay	Lao	Others	
	Van Ho	Chieng Xuan	15	62	17						0			6
	Thuan Chau	Ban Lam	87	13										0
Hoa Binh	Lac Son	Ngoc Lau			99									1
	Mai Chau	Pa Co		99										1
	Da Bac	Tien Phong			97									3

The feature of infrastructure in these surveyed communes is characterized by good quantity but poor quality. It can be considered through several indicators like electricity, water use, school, and medical station. According to the survey, the school system (from kindergarten to secondary school), medical system and electric grid have been setup in all communes. However, schooling system and medical system have been constructed for a long time, old and downgraded building. Percentage of village accessed the national electric grid is gradual reduce from downstream (Hoa Binh) to the upstream (Lai Chau). There are only two communes (Son La province) using clean water, the others are using stream water without sanitation treatment.

Annual income per capita in the surveyed communes and villages are relatively low compared to the average level of the target districts (on average 18 million VND per capital per annual) (Preparation survey for JICA3 project, 2016). The average was only 9 million VND per capita per annual, corresponding to 750 thousand VND per capita per month. The commune has lowest income per capita with 6 million/person/year and the communes with average income level the highest per capita is 13.5 million/person/year (see more details in annex 2).

High poverty households rate (most of selected communes have more than 50% households under poverty line[2] (there are only 4 communes less than 50% poor households including Muong Nha, Pha Mu, Muong Giang and Pa Co communes). The average common rate of poor and near poor household is 44%. There is a lowest rate of poverty in three communes in Son La province (average rate is 26%), and the highest rate in those communes of Dien Bien province (average rate at 66%). The poverty issues are key constraints for socio-economic development in these communes and villages.

2.2 Issues in livelihood development

Livelihood activities in these communes are diversified from agriculture to non-farm activities. However, in terms of income generation, agricultural activities included food crop cultivation and animal raisings are remain important in most of household. Main income source comes from agriculture sector. The major products are upland rice, maize and cassava, and these products could fulfill their food security and this motivates people to enlarge shifting cultivation area which affect forest degradation. Crops vary by nature and topography condition, but the major crops are paddy rice, upland rice, maize and cassava. There are some commercial crops as maize, cassava, peanut, soybean, sugar cane which could be for sale to

[2] Based on Decision No. 59/QĐ-TTg dated 19 November, 2015 by the Prime Minister of Vietnam Government on Multidimensional Poverty Line for National Target Program of poverty reduction in the period 2016-2020.

get cash income. Livestock is also widely praised by most of the households. The second earning sources which are closely related to forest are firewood and NTFPs collection, and the payment for forest protection works under PFES and other government programs. Meanwhile, those activities such as aquaculture, non-farm (handicraft, catch fish etc.,), and business are not the major livelihood activities, which are taken place in only several communes. According to the survey, there are 7 communes having aquaculture activities but with very small scales, 2 communes involving with non-farm activities, and 2 communes having local business activities.

For cultivation activities, rice and maize cultivations are the important livelihood at all surveyed communes. Issues in livelihood development in cultivation are mainly related to such crops. The survey results highlight two main issues: (i) New crop varieties have been introduced and replaced indigenous crops, and fertilizers and pesticides have been used more often; crop yield are reported to increase about 10-20 percent comparing with 5 years ago thanks to new farming varieties, fertilizer and pesticide; (ii) the common feature of the agricultural cultivation system of the communes which are greatly depending on the weather condition and causing uncertain productivity and unstable output.

For the livestock raising activities, the top three major livestock are buffalo, pig and chicken. Two issues in livestock development rising over time have been investigated through the survey; (i) epidemics such as bird flu and blue ear disease occurring almost every year, and (ii) lack of grass to feed cows and buffaloes in during the winter season.

During the production process, local farmer are facing and bearing with the informal credit. It is reported that local farmer often have to make debt purchase for fertilizer for their crop. When harvest comes, debt owners will come and buy their product after deducting the debt plus the interest rate which is often several times higher than that of State Bank.

Related to the market aspect, the survey is reported that all crop input providers and crop output purchasers are outsiders. People have to go to regional market to buy fertilizers and pesticides, while they often sell their farming product to outside Kinh merchants in the field, right after harvest.

Most of the labor force is based on agriculture sector which may also create high pressure on land use and forest resources. Transferring labor forces to other sectors are not easy because of knowledge abilities and cultures. The local people, even youth, prefer to stay at their homeland. On the other hand, in accordance with the population growth, the people need more land for self-sufficiency, which are also main course of deforestation (Preparation survey for JICA3 project, 2016).

Finally, the survey addresses the landless household situation. Although no official data on this situation, most of the landless households are young couples who just married and do not have sufficient farming land.

2.3 Key stakeholders influencing land and forest use

Most of agricultural land and production forest area have been allocated to households since the Land Law 1993. However, most of the protection forest and special use forests are primarily assigned to the forest management boards, and then, the communities and households are allocated or contracted for protection works through the forest management boards. Commune authorities are assigned to manage the area of unused land.

Laws and policies in Vietnam emphasise on implementation of forests and forest land allocation in order to create participation of local people and to promote good forest

management. Activities on forest and forest land allocation require a certain budget. However, as the budget is always limited land allocation activities go slowly and not yet completed. On the other hand, land allocation activities require a good co-operation and great efforts among concerning organizations, such as DONREs, forest ranger stations, DARD, DONRE and DARD. The issues of inconsistent of data on forest land has exposed among those stakeholders during the survey. It could be supposed that the reason is come from poor co-operation between related organizations.

The role of commune officers, especially CPC's chairman and the communal police are extremely important to lead the success of any development project. Those persons control the human resources, essential information and have power to influence village's leaders and people.

Through the observation on the well-being analysis conducted in the PRA activity, key stakeholders influencing land and forest use were identified as the people outside commune, landless household within and without commune, and poor household in most of the cases.

It could be observed that formation of forest protection team took a great role for forest management activities. The team is usually composed of village leaders, police, and youth Union's chairman, and seems to be respected by villagers.

The landless households and poor households are affecting land and forest use by doing livelihood activities such as; i) illegal logging (Den village, Ngoc Lau commune), ii) illegal farming (Lam A village, Ban Lam commune), iii) slash and burn for expanding the cultivation area (Nam Danh village, Nam So commune). Illegal logging by the people outside commune/province, and illegal livestock grazing were also reported as the causes of forest degradation.

2.4 Key drivers of deforestation and forest degradation

Local people have reported that there are around ten drivers for deforestation and forest degradation. Natural hazard (snow phenomenon in last winter reason) is also quite serious, but the rest drivers are caused by human actions. They are; illegal logging, enlargement of food crops cultivation area, hunting, free grazing cattle, heating demand in winter, building wood housing, slash and burn, collecting forest products and rotational agriculture. High dependence on timber for building houses and fetching firewood for home consumption are also key divers of deforestation in the surveyed communes.

On the other hands, poor activities of forest rangers, poor implementation of laws and policies and firewood collection were also reported. The reasons of poor activities of forest rangers were reported as; poor road conditions, lack of equipments, poor co-operation among rangers and CPC and laziness of rangers. Poor implementation of laws and policies are resulted in poor investment given to policies implementation, such as policies on forests and forest land allocation, trees plantation.

People's awareness of benefit derived from forest protection and the importance of sustainable use of forest have not been significantly improved in recent years. People are not quite able to distinguish production forest, protection forest and special used forest. No matter who is managing forest, many local villagers still think that they have rights to collect timber for housing; firewood collecting for cooking or heating; or even farming when they have insufficient land.

The main stakeholders, as mentioned above, are mainly poor households, landless households, and high market demand of some commercial crops as corn, cassava. The major drivers and

underlying causes of deforestation and forest degradation are presented in the annex 7-10.

2.5 Current forest management and development activities

After starting the forest management by FMB, with allocating the forest land use certificate to individual households, forest protection performance has become relatively better. Meanwhile, PFES and/or FPDP have started to be paid to forest owners or forest protection team (11 commune in total 12 surveyed communes have received PFES and FPDP since the last several years); many villages in the survey area developed their own village regulation on forest protection and management; received livelihood support as well as introduction of alternative energy tools from government programs and projects. The forest coverage has been recovered during the recently years.

However, although forest coverage has been increasing over time, forest quality and forest biodiversity have decreased significantly because of rapid decline of big trees and wild animals.

2.6 Gender differences in the use of natural resource and other livelihood activities

Regarding to social/cultural issues related to gender in the use of natural resource and livelihood activities, each ethnic group has their own feature. However, the common feature is that women in general are involved more in livelihood activities though there is no significant difference between man and women in terms of the use of natural resource such as NTFPs or fuel wood collection.

Observation in survey sites of Son La, Hoa Binh, and Dien Bien province show that women do more housework than man such as cooking, feeding livestock and children care. In all three villages of Lai Chau province with Thai, Muong and Dzao, especially in the last two ethnic groups, women seem to be more passive, leaving the right of making decisions to men. The females do play an important role in exploiting forest products everyday, being in charge of collecting vegetables, firewood, and medical herbs. One evident is that logging is associated with men mainly because it requires more physical strength.

Therefore, an investment in forest development should pay more attention to empower females, and should enhance the male acknowledge of women's status so as to help women improving their family status as well as their participation in the use of natural resource and livelihood activities.

2.7 Recommendation on livelihood options

Road accessibility shall be primary option which may enhance forest protection at village level. This is because better road will give local villagers more opportunities to sell their farming products at higher price, while buying necessary goods at cheaper price. Together with road improvement, opening market in the commune could be also effective option. Finally, introduction of commercial crops and fruit tree plantation by contracting with potential markets is a potential opportunity to get higher income than conventional mono crop farming. These interventions are believed to have positive impacts on local people's livelihood development.

The following table shows the recommended livelihood development options proposed by the

survey team's point of view. It was prepared based on practical condition in the survey sites with forest sustainability orientation, although the condition and needs differ from site to site.

Table 5: Proposed options based on practical condition in target communes

No	Proposed options	Meaning to forest protection	Approach method	Notes
1	Cattle raising model	Provide people another significant income source so as reduce pressure of farming land shortage and deforestation	Common interest groups in each village, establish a value chain for specific cattle. Household size, available labor and maize land of registered households should be take into consideration	12/12 villages surveyed
2	Cook stove provision	This stove can use corn-cob to burn, so it saves fuel wood, and reduce extraction fuel wood from natural forest. So saving time and better for environment	Household based on their actual need	6/12 villages surveyed[3]
3	Agroforestry systems	Agroforestry system can provide a diversity of products so that can help farmers to reduce the risk of agricultural production. In addition, it can maintain soil fertility and counter soil erosion, improve poverty reduction so as reduce dependence on forest resources	Establishing a value chain analysis to identify potential products. Incorporating indigenous knowledge and modern technologies on design agroforestry model	6/12 villages surveyed[4]
4	Fruit tree plantation	New fruit varieties can be planted in home garden and bare land. It will create more income for farmers. In some cases, fruit trees can provide fuel wood from branch pruning so that help to reduce fuel wood extraction from natural forest	Introduction the model of fruit plantation with new fruit varieties by organizing study tour, and household approach based on their land size	5/12 villages surveyed
5	Fodder grass plantation and cattle raising	Grass can be planted as a green contour in the field so it can prevent soil erosion and provide significant fodder for cattle especially in winter season so as people do not have to leave their cattle grazing freely in forest	Household based on their actual need and their land size for fodder plantation	4/12 villages surveyed
6	Fish cage raising	Getting more income so as reducing pressure of farming land shortage and deforestation, accordingly	Common interest groups in each village; establish a value chain for fish. Household size and available labor of registered households should be take into consideration	2/12 villages surveyed (Lai Chau has no information) these village as they are adjacent to Da river with large water surface area
7	New crop varieties	Increase crop productivity and income, reduce land use areas and dependence on extraction products from forest	Land, climate and market analysis conducted for each crop before large scale expand	4/12 villages[5] surveyed (Lai Chau has no information)
8	Forest plantation	Increase forest cover and provide wood for house construction, making of home furniture, and reduce dependence on extraction woods from natural forest	Can be approached as community forest plantation or household forest plantation	3/12 villages surveyed in Son La province (Lai Chau has no information)

[3] Noted that 6 villages proposed this activity here is picked-up from the on the recommendation section of the Hoa Binh and Son La report, meanwhile the PRA results in report just shows only two village proposed this activity.

[4]Noted that 6 villages proposed this activity here is picked-up from the on the recommendation section of the Hoa Binh and Son La report, meanwhile there is no village proposed this activity in the PRA result of the report.

[5]Noted that 4 villages proposed this activity here is picked-up from the on the recommendation section of the Son La report, meanwhile there is only a village in Hoa Binh proposed this activity in the PRA result of the report

No	Proposed options	Meaning to forest protection	Approach method	Notes
9	Crop output marketing and networking[6]	Increase people income via stable and reasonable market price for their products; improve poverty reduction so as reduce dependence on forest resources	Establishing a value chain analysis to identify/form potential and sustainable stakeholders/cooperation mechanism to ensure win-win principle	Household in each village shall register for their preference activities/groups
10	Crop input provision contractor including fertilizer/pesticide, farming technique etc[7].	Reduce crop investment and dependence on outside suppliers;	Establishing a value chain analysis to identify/form potential and sustainable stakeholders/cooperation mechanism to ensure win-win principle	Household in each village shall register for their preference activities/groups
11	Credit for small business	Small groceries will bring people alternative income source to substitute for decreasing farming land	Household survey; priority given to those who are living alongside village roads; provide market training	In all three villages, especially in Xa Linh

2.8 Potential safeguard issues

As the people are living closely to forest lands using forest resource and land for ages, it is not easy to change their traditional faming behavior, particularly in the limited natural and geographical condition of the target sites. Thus, promoting forest development and management activities contain some potential risks and certain mitigation measures will be necessary to avoid those risks. The key potential risks analyzed and its mitigation measures analyzed by the expert of the survey team are explained in the following table.

Table 6: Potential risks for livelihood activities development

No	Potential risks	Description	Mitigation measure
1	Conflict between local villagers and NR management board	Farming land pressure in the near future when population increase; increasing timber demand for wooden houses from young married couple, especially when they prefer to have big and concrete ones	Get people involvement in forest protection as in Den and Dieng village; maintain certain area for planting timber trees that people often use to build houses; annual approved timber collecting permit must be transparency, fair and based on actual demand; NR management board should consider to increase PFES, or additional supports if not.
2	Conflict between villagers and outside villagers[8]	People in neighbor communes may cross their territory and encroach forest in other commune for farming	Strict management to assure no forest encroaching by outsiders. Village forest protection team should be developed and provided necessary training; Separate budget for these teams should be available; team members shall have uniform.
3	Negative effects of climate change in agricultural production[9]	Climate hazard can be affected on livelihood of local farmers due to it can reduce crops productivity and make a mass fate of livestock	Diversity of agricultural production systems to reduce the risk by enhancing the tolerable agricultural production systems. Agroforestry systems should be considered to establish to mitigate negative effects of climate change
4	Degraded soil cultivation	Most of lands for agricultural production are with high slope and without solution of soil protection leading to soil erosion and infertility. The consequence of this is low crop productivity and high investment.	Soil erosion prevention should apply in all sloping land cultivation. Complex agroforestry systems should be considered as a good solution to conserve sloping land and maintain crop productivity

[6]This picked-up from the recommendation section of the Hoa Binh report only
[7]This picked-up from the recommendation section of the Hoa Binh report only
[8]The potential rick number 1 and 2 are picked-up from the recommendation section of the Hoa Binh report.
[9] The potential rick number 3 to 6 are from the recommendation section of the Son La report.

No	Potential risks	Description	Mitigation measure
5	Water scarcity supply for living and cultivation	Under ground water is closely related to natural forest remains. Presently, natural forest is limited amount areas and degraded quality leading to lack of underground water supply for living and cultivation.	Using concrete tanks for storing raining water in raining season for using in dry season, and promoting afforestation as well as protecting natural forests in watershed areas for supplying underground water
6	Cultural identities marginalization	Different ethnics have different beliefs in forest. Forest not only provides forest products, but also provides their cultural spaces such as buried ground, sacred spaces for instance.	The traditional spiritual space on forest land should be maintained, respected and put under their management. It is observed that sacred forests are conserved very well in Son La province.

ANNEXES

Annex 1: Number participants attended meeting by province

Unit: Person

Province	Commune	Village	Advanced meeting with leaders of CPC	Meeting with leaders of CPC and village chairpersons	Meeting with leaders of village	Meeting with villagers of village
Dien Bien	Muong Nha	Xom	N/A	44	N/A	32
	Ta Ma	Da Nang	N/A	25	N/A	46
	Muong Tung	Moi	N/A	29	N/A	45
Lai Chau	Nam So	Nam Danh	N/A	36	N/A	43
	Pa Mu	Huoi Bac	N/A	25	N/A	40
	Phong So Lin	Lo To Phin	N/A	26	N/A	38
Son La	Muong Giang	Pa Uon	10	45	10	50
	Chieng Xuan	Dup Ken	10	45	10	47
	Ban Lam	Ban Lam A	10	45	9	45
Hoa Binh	Ngoc Lau	Dien	10	33	7	45
	Pa Co	Xa Linh	10	35	7	45
	Tien Phong	Dieng	10	28	7	45
Total			**60**	**416**	**50**	**521**

Source: Synthesize from provincial socio-economic survey reports of four target provinces

Annex 2: Average per capita income per year of commune/village surveyed

Province	District	Commune	Village	Average per capita income, per year (VND/prs/year)
Dien Bien	Dien Bien	Muong Nha	Xom	10,000,000
	Tuan Giao	Ta Ma		6,000,000
	Muong Cha	Muong Tung		10,000,000
Lai Chau	Tan Uyen	Nam So	Nam Danh	7,206,000
	Than Uyen	Pha Mu	Huoi Bac	N/A
	Sin Ho	Phang So Lin	Lo To Phin	N/A
Son La	Van Ho	Chieng Xuan	Dup Ken	6,000,000
	Quynh Nhai	Muong Giang		12,000,000
	Thuan Chau	Ban Lam	Lam A	6,000,000
Hoa Binh	Lac Son	Ngoc Lau		12,000,000
	Mai Chau	Pa Co		7,300,000
	Da Bac	Tien Phong		13,500,000

Source: Synthesize results from the socio-economic survey report of four provinces

Annex 3: Agriculture Situation in the Surveyed Commune in Dien Bien Province

District	Commune	Major crops	Production area (ha)		Average yield (ton/ha)		Purpose (%)		Practice of shifting cultivation
			1st crop	2nd crop	1st crop	2nd crop	Home consumption	Sales	
Dien Bien	Muong Nha	Paddy rice	329.5		3.7		100%		Model 1: the upland rice cultivated within 2-3 crops, then let them fallow in 2-3 years, and then continue growing with upland rice. Model 2: upland rice cultivated within 2-3 crops, then cultivated cassava in 1-2 crops, after that let them fallow in 2-3 years before start with new cycle of crop pattern; model 3: with the production period longer by cultivated the hill rice in 2-3 crops, maize in 1-2 crops, then cassava in 1-2 crop, after that let them fallow in 2-3 years before start with the new production period
		Upland rice	922		1.0		100%		
		Maize	1,115	-	3.9	-	5-10%	90-95%	
		Cassava	273	-	6.2	-	100%	-	
Tuan Giao	Ta Ma	Paddy rice	14	-	5.7	-	NA	NA	Two shifting cultivation patterns, first people use land for upland rice cultivation within 2 or 3 years, then continue to apply maize cultivation for another period of 2-3 years, after that keep it in a fallow period taking about 2-3 years. The second pattern, people use the land for maize cultivation with application of short fallow period in combination with cattle raising
		Upland rice	1,318	-	0.9	-	NA	NA	
		Maize	1,249	-	4.0	-	NA	NA	
Muong Cha	Muong Tung	Paddy rice	115.7	158.3	4.7	-	100	0	The circulation of land use is 7-8 year round. It means that the land is used for cultivation in 4-5 years successively then leave fallow. Grasses and other small tree grow for 2-3 years in order to enrich soil fertility.
		Upland rice	635	-	1.2	-	100	0	
		Soybean	635	-	-	-	0	100	
		Peanut	350	-	1.9	-	0	100	

Source: Dien Bien socio-economic survey report, 2016

Annex 4: Agriculture Situation in the Surveyed Commune in Lai Chau Province

District	Commune	Major crops	Production area (ha)		Average yield (ton/ha)		Purpose		Practice of shifting cultivation
			1st crop	2nd crop	1st crop	2nd crop	Home consumption	Sales	
Tan Uyen	Nam So	Paddy rice	92	395	5.7	4.3	N/A	N/A	Rotation shifting cultivation has been less practiced in the last decade due to the stringent regulation of both the district's department of forest protection as well as of commune
		Upland rice	430	-	0.9	-			
		Cassava	145	-	6.5	-			
		Maize	120	-	3.5	-			
Than Uyen	Pha Mu	Paddy rice	42.1	25	4.0	5.3	N/A	N/A	Practice of shifting cultivation has been rare due to the restriction by district's department of forestation
		Maize	5	60	2.7	3.5			
		Upland rice	62	-	1.0	-			
		Cassava	42	-	7.5	-			
Sin Ho	Phang So Lin	Paddy rice	220	-	4.1	-	N/A	N/A	There is no evidence of practicing rotational shifting

District	Commune	Major crops							Practice of shifting cultivation
		Major crops	Production area (ha)		Average yield (ton/ha)		Purpose		
			1st crop	2nd crop	1st crop	2nd crop	Home consumption	Sales	
		Maize	350	-	2.0	-			cultivation in the commune. Some report that this phenomenon has been controlled by the communal authority's regulation on protecting forest
		Bean	75	-	4.0	-			
		Upland rice	54	-	1.0	-			
		Peanut	26	-	0.9	-			

Source: Lai Chau socio-economic survey report, 2016

Annex 5: Agriculture Situation in the Surveyed Commune in Son La Province

District	Commune	Major crops							Practice of shifting cultivation	Livestock (average no. per household)			
		Major crops	Production area (ha)		Average yield (ton/ha)		Purpose (%)			Buffalo	Oxen	Pig	Poultry
			1st crop	2nd crop	1st crop	2nd crop	Home consumption	Sales					
Van Ho	Chieng Xuan	Paddy rice	122	-	4.7	-	100	0	The shifting cultivation is now not practiced at present in the commune due to land shortage and cutting forest for expanding field is strictly prohibited	2.3	2.2	2.9	15.3
		Maize	1149	-	4.6	-	20	80					
		Cassava	17	-	20.0	-	0	100					
		Canna	31	-	50.0	-	0	100					
		Mango	12	-	5.0	-	-	-					
		Banana	6	-	20.0	-	-	-					
		Late-ripening longan	33	-	9.0	-	-	-					
Quynh Nhai	Muong Giang	Paddy rice	29.7	73.8	5.5	4.7	100%	0	N/A	N/A	N/A	N/A	N/A
		Maize	690.9	-	4.2	-	20%	80					
		Cassava	101.9	-	10.0	-	0%	100					
		Soybean	150	-	1.2	-	-	-					
Thuan Chau	Ban Lam	Paddy rice	4.6	107	6.0	5.5	100	0	N/A	N/A	N/A	N/A	N/A
		Upland rice	30	-	1.2	-	100	0					
		Maize	140	-	5.5	-	20	80					
		Cassava	230	-	11.0	-	0	100					
		Coffee	147	-	5.9	-	0	100					

Source: Son La socio-economic survey report, 2016

Annex 6: Agriculture Situation in the Surveyed Commune in Hoa Binh Province

District	Commune	Major crops							Practice of shifting cultivation	Livestock (average no. per household)			
		Major crops	Production area (ha)		Average yield (ton/ha)		Purpose (%)			Buffalo	Oxen	Pig	Poultry
			1st crop	2nd crop	1st crop	2nd crop	Home consumption	Sales					

Lac Son	Ngoc Lau	Maize Paddy rice Peanut Sugarcane	700 55 49 68	400 13 49 0	3.0 3.5 3.5 50.0	4.5 3.8 3.5 -	20-30 100 50 0	70-80 0 50 100	Not common any more due to lack of cultivation land	1.3	1.3	3.2	35.5
Mai Chau	Pa Co	Maize Paddy rice Tea	760 14.6 120	- - -	6.0 4.0 3.5	- - -	20-30 100 0	70-80 0 100	Not popular because of insufficient land	0.7	1.0	1.6	1.55
Da Bac	Tien Phong	Maize Cassava Paddy rice	255 220 24	- - 24	6.0 4.5 6.2	- - -	N/A	N/A	Rotation shifting cultivation is not practiced at the present due to land shortage and the strict management over protection forest	0.7	1.1	1.5	14.5

Source: Hoa Binh socio-economic survey report, 2016.

Annex 7: Forest Resources and Key Drivers of Forestation in Dien Bien Province

District	Commune	Village	Important Forest resources for the local communities			Drivers of deforestation	
			Resource	Frequency	Purpose	Major driver	Underlying causes
Dien Bien	Muong Nha	Xom	1. Round timber	Whenever a new house to be constructed or family splitting	To build or fix house; not for sale	N/A	Forests are brought under category of protection forest and timber collection is probated; Over exploitation for house construction
			2. Firewood	Everyday	Daily cooking	N/A	There is no conversion of forest into land for food crops cultivation
			3. Bamboo shoot	Occasionally in raining season during April and August	Self-consumption and selling	N/A	Reduction of area of bamboo due to bamboo die naturally
			4. Honey	Occasionally in raining season during April and August	Self-consumption and selling	N/A	Over exploitation
Tuan Giao	Ta Ma	Na Dang	1. Round timber	Whenever a new house to be constructed or family splitting	To build or fix house; not for sale	1. Timber cutting for building house	Construction of hydropower plants had led to resettlement of a large number of households. These households had to collect round timber for constructing their houses.
			2. Firewood gathering	Everyday	Daily cooking	2. Rotational shifting cultivation	People have had enough land for food crops cultivation
			3. Grazing area	During dry season	To raise cattle	3. Encroaching of people outside of the village	There were people from Quynh Nhai (a district of Son La province) come to clear forests for a food crops cultivation
			4. Bamboo stems and bamboo shoot	Occasionally in raining season during April and August	Self-consumption and selling	4. Illegal logging	People in the commune and outsiders were trying to steal high value trees in

							the forests of Ta Ma for cash income
Muong Cha	Muong Tung	Moi	1. Firewood gathering	Everyday	Daily cooking		N/A
			2. Round timber	Whenever a new house to be constructed or family splitting	To build or fix house; not for sale	N/A	N/A
			3. Bamboo stems and bamboo shoot	Occasionally in raining season ranging between May and August annually	Self-consumption and selling	N/A	N/A

Source: Dien Bien socio-economic survey report, 2016

Annex 8: Forest Resources and Key Drivers of Forestation in Lai Chau Province

District	Commune	Village	Important Forest resources for the local communities			Drivers of deforestation	
			Resource	Frequency	Purpose	Major driver	Underlying causes
Tan Uyen	Nam So	Nam Danh	1. Timber	When new household Build a house	Fixing/building House, not for sales	1. Involuntary burning the forest ground for collecting NTFPs or hunting	Expanding the cultivation area for upland rice
			2. Firewood	Occasionally	Home use (cooking and heating)	2. Wood logging	Burning forest ground for collecting honey or for hunting
			3. Bamboo shoot	Everyday		3. Collecting forest products (galingale, crocus, ginseng)	Providing wood for building the "stilt house"
			4. Forest vegetable			4. Cultivating upland rice	
			5. Mushroom			5. Slash-and-burn	
			6. Banana blossom, Phrynium & Dioscorea hamiltonii			6. Hunting	
Than Uyen	Pha Mu	Huoi Bac	1. Timber	2-3 times a year	Fixing/building house, not for sales	1. Illegal logging	Cutting tree for fixing/building house; external villagers illegally exploit
			2. Firewood	Everyday	Home use (cooking and heating)	2. Slash and burn	
			3. Bamboo tree	Twice a year	Making fence	3. Illegal hunting	
			4. Forest vegetable	Twice a year	Home consumption	4. Illegal and involuntary burning the forest ground	
			5. Honey	Once a year	Sale for earning money	5. Free grazing cattle	
			6. Orchid	Once for several years	Sale for earning money	6. Collecting forest products	
			7. Medical plants	When household member get sick	Home consumption		
Sin Ho	Phang So Lin	Lo To Phin	1. Timber		Fixing/building house, not for sales	1. Stealing forest products (medicinal plants)	Forest products were stolen by people from other villages for sale
			2. Firewood		Home use (cooking and heating)	2. firewood	

District	Commune	Village	Important Forest resources for the local communities			Drivers of deforestation	
			Resource	Frequency	Purpose	Major driver	Underlying causes
			3. Underground water		Providing water for local people	3. House construction	
			4. Forest soil		For rice and maize cultivation	4. Slash and burn	Lack of cultivation land and low awareness of environmental protection
						5. Free grazing cattle	Lack of cattle feed
						6. Rotational agriculture	Traditional custom of local people

Source: Lai Chau socio-economic survey report, 2016

Annex 9: Forest Resources and Key Drivers of Forestation in Son La Province

District	Commune	Village	Important Forest resources for the local communities			Drivers of deforestation	
			Resource	Frequency	Purpose	Major driver	Underlying causes
Van Ho	Chieng Xuan		1. Firewood	Everyday	Daily self-consumption	1. Natural hazard	Cold weather and wild fire
			2. Bamboo shoot	Seasonally	Home use	2. Illegal farming	Landless people
			3. Bamboo	Occasionally	Building fence, weaving and broom making	3. Illegal logging	The poor; the outsider people
			4. Timber	When new household build a house	Building house		
Quynh Nhai	Muong Giang		1. Firewood	Everyday	Daily self-consumption	1. Natural hazard	Wild fire
			2. Bamboo shoot	Seasonally	Home use	2. Illegal farming	Landless people
			3. Bamboo	Occasionally	Building fence, weaving and broom making	3. Illegal logging	The poor; the outsider people
			4. Timber	When new household build a house	Building house		
Thuan Chau	Ban Lam	Lam A village	1. Bamboo shoot	Seasonally	Home use	1. Natural hazard	Cold weather and wild fire
			3. Bamboo	Occasionally	Building fence, weaving and broom making	2. Illegal farming	Landless people
						3. Illegal logging	The poor; the outsider people

Source: Son La socio-economic survey report, 2016.

Annex 10: Forest Resources and Key Drivers of Forestation in Hoa Binh Province

District	Commune	Village	Important Forest resources for the local communities			Drivers of deforestation	
			Resource	Frequency	Purpose	Major driver	Underlying causes
Lac Son	Ngoc Lau	Den	1. Round Timber	When new household build a house everyday monthly	Fixing/building house, not for sales	1. Illegal logging	People from bordering Thanh Hoa province come to cut trees.
			2. Firewood		Home use (cooking)		
			3. Herbal plants		Home use (medicine, drinking water)		Local landless household/ poor people also cut trees.
			4. Banana	Once in two days	Food for livestock, parties, ceremonies	2. Hunting	Due to difficult accessibility, patrol cannot be done in detail and frequent.
			5. Bamboo shoot	June-August (once in each month)	Home consumption, rarely for sale	3. Natural hazards	
			6. Wood ear mushroom	Occasionally in rainy season (Apr-Sept)	Home consumption		
			7. Shell animal	Occasionally in rainy season (May-Sept)	Home consumption		
Mai Chau	Pa Co	Xa Linh	1. Timber	When new household build a house	Fixing/building house, not for sales	1. Illegal logging	Local landless household/ poor people also cut trees.
			2. Firewood	Everyday	Home use (cooking, heating), sometimes for selling	2. Illegal farming	Outsiders and insiders who do not have sufficient land
			3. Farming land	Yearly (one crop a year)	Food for family	3. Illegal livestock ranching	Outsiders and insiders who do not have grazing land
			4. Grazing ground	When crops are not harvested	Feed for cattle	4. Hazards	
			5. NTFP	Occasionally	Feedstuff for family	5. Heating demand in winter	
						6. Wood housing structure	
Da Bac	Tien Phong	Dieng	1. Firewood	Everyday	Home use (cooking and heating)		
			3. Water resource	Everyday	Daily use	3. Natural hazards	
			4. Timber	Occasionally; from planted forest only	Housing		

Source: Hoa Binh socio-economic survey report, 2016

Annex 11: Payment for the Forest Protection Activities in Four Provinces

Province	District	Commune	Protection Management Fee				PFES			
			Started year	Protection area (ha)	Payment as of 2015 (VND)	Unit cost (VND/ha)	Started year	Protection area (ha)	Payment as of 2015 (VND)	Unit cost (VND/ha)
Dien Bien	Dien Bien	Muong Nha	2013	2,388	477,582,000	200,001	-	-	-	-
	Tuan Giao	Ta Ma	-	-	-	-	2013	5,412	1,661,619,080	307,000
	Muong Cha	Muong Tung	2014	2,093	585,956,000	280,000	2015	4,431	1,243,292,000	280,589
Lai Chau	Tan Uyen	Nam So	2011	879	262,746,250	298,983	2012	2,465	785,972,095	318,866
	Than Uyen	Pha Mu	2008	721	215,500,000	299,098	2011	2,519	1,153,300,000	457,895
	Sin Ho	Pang So Lin	1998	1,030	308,850,000	300,000	2011	1,156	365,138,000	316,000
Son La	Van Ho	Chieng Xuan	2011	1,209	120,938,000	100,000	N.A.	N.A.	N.A.	N.A.
	Quynh Nhai	Muong Giang	N.A.	N.A.	N.A.	N.A.	2010	2,173	584,607,380	269,032
	Thuan Chau	Ban Lam	2011	1,427	142,700,000	100,000	N.A.	N.A.	N.A.	N.A.
Hoa Binh	Lac Son	Ngoc Lau*	-	-	-	-	2011	170	34,000,000	200,000
	Mai Chau	Pa Co	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
	Da Bac	Tien Phong	-	-	-	-	2011	1,142	182,720,000	160,000

Source: Synthesize results from the socio-economic survey report of four provinces

Annex 12: Village Fund in Four Provinces

Province	District	Commune	Village	Village fund			
				Yes/No	Established year	Saved amount (VND)	Major use
Dien Bien	Dien Bien	Muong Nha	Xom	Yes	N/A	N/A	Using percentage of amount payment of forest protection to village fund
	Tuan Giao	Ta Ma	Na Dang	Yes	N/A	N/A	Using around 10% of obtained amount (payment for forest protection) for forest protection activities and common expenditures
	Muong Cha	Muong Tung	Moi	Yes	N/A	N/A	Village fund pay for forest protection team
Lai Chau	Tan Uyen	Nam So	Nam Danh	Yes	N/A	N/A	Providing assistance to the sick and help on organizing village events (e.g. buying foods for village meeting)
	Than Uyen	Pha Mu	Huoi Bac	No			
	Sin Ho	Phang So Lin	Lo To Phin	No			
Hoa Binh	Lac Son	Ngoc Lau	Den	Yes	N/A	N/A	Paying for tea, cigarette as well as for other necessary facilities in village meeting
	Mai Chau	Pa Co	Xa Linh	No			
	Da Bac	Tien Phong	Dieng	No			
Son La	Van Ho	Chieng Xuan	Dup Ken	Yes	N/A	24,000,000	Credit for poor household (2-3 HHs per year, 1 year, annual interest of 1.5%)
	Quynh Nhai	Muong Giang	Total	Yes	2010	N/A	Paying for the forest protection groups and for common activities such as periodical or annual meeting, visiting the sick, funeral
	Thuan Chau	Ban Lam	Total	Yes	N/A	10,000,000	Credit for poor household (1-1 HHs per year, 1 year, annual interest of 0.1%)

Source: Synthesize results from the socio-economic survey report of four provinces

Annex 13: Proposed livelihood options for better forest management in the survey sites

Province	District	Commune	Village	Proposed livelihood options for better forest management
Dien Bien	Dien Bien	Muong Nha	Xom	1. Cattle (buffalo and cow) raising model 2. Bio-gas installation, 3. Small scale irrigation 4. Fruit trees plantation, 5. Pig raising model
	Tuan Giao	Ta Ma	Na Dang	1. Cattle (buffalo, cow and goat) raising model 2. Pig raising model, 3. Small scale irrigation 4. Fruit trees plantation, 5. Vegetable plantation 6. Providing threshing machine, corn beating machine
	Muong Cha	Muong Tung	Moi	1. Cattle (buffalo, cow and goat) raising model 2. Pig raising model, 3. Small scale irrigation 4. Poultry raising model, 5. Fishery 6. Bio-gas installation
Lai Chau	Tan Uyen	Nam So	Nam Danh	1. Rice cultivation, 2. Buffalo raising 3. Pig raising, 4. Chicken raising 5. Duck raising, 6. Cinnamon cultivation 7. Pine cultivation
	Than Uyen	Pha Mu	Huoi Bac	1. Rice cultivation, 2. Pig raising, 3. Chicken raising 4. Buffalo raising, 5. Cow raising, 6. Cassava cultivation 7. Goat raising, 8. Maize cultivation, 9. Goose raising
	Sin Ho	Phang So Lin	Lo To Phin	1. Wet rice cultivation, 2. Upland rice cultivation 3. Maize cultivation, 4. Buffalo raising 5. Cow raising, 6. Pig raising, 7. Construction worker 8. Small trading
Son La	Van Ho	Chieng Xuan	Dup Ken	1. Constructing internal village road; road from the village to the national road (800 m) 2. Growing fruit tree (longan, mango) 3. Growing grass and raising cattle 4. Improving water supply system 5. Fencing for fruit garden
	Quynh Nhai	Muong Giang	Pa Uon	1. Growing grass and raising buffaloes, cows 2. Raising fishes in the Da river's reservoir 3. Making nets for fishing 4. Growing fruit tree
	Thuan Chau	Ban Lam	Lam A	1. Growing grass and raising buffaloes, cows 2. Fruit tree cultivation, 3. Raising fish 4. Agro-forestry farming model used on slopping area
Hoa Binh	Lac Son	Ngoc Lau	Den	1. Clean water reservoir, 2. Cow raising model 3. Pig raising model, 4. Introduction of new maize variety
	Mai Chau	Pa Co	Xa Linh	1. Traditional weaving, 2. Cow raising model 3. Water well building, 4. Introduction of new peach species
	Da Bac	Tien Phong	Dieng	1. Cow raising model, 2. Fish cage model 3. Pig raising model, 4. Grass plantation

Source: Synthesize results from the provincial socio-economic survey reports

Annex 14: Experiences on Participation in Forest Development Projects in the Surveyed Commune

Survey site	Name of the program	Executing agency	Major activities/inputs	Major result	Lessons	Year/period of implementation
Muong Nha DB	1. National Program on Poverty Alleviation (phase 1)	Government of VN	Construction of electricity grid, road and classrooms in combination with supports of crop seeds, salt and livestock	N/A	(i) Activities of the project are built on actual needs of the poor households with bottom-up approach and community based approach are applied. This helps to identify the most suitable supports and the most appropriate way to provide those supports. (ii) Some better off households are also allowed to join the interest groups in order to help the poor.	2005-2010
	2. Project on Poverty Elimination for Northwest Region (phase 2 of the National Program on Poverty Alleviation)	Government of VN	Project provides in-kind supports for poor households in the village. Under instruction of the project's staff, poor households in the village have organized themselves into interest groups, such as goats raising group, chicken raising group and so on.	64 households of six villages (Pha Thanh, Pu Lau, Pha Lay, Hoi Huong, Khon Ken and Phi Cao village) of Muong Nha are beneficiaries of this project. Members of goat raising groups have obtained 64 goats	(i) Activities of the project are built on actual needs of the poor households with bottom-up approach and community based approach are applied. This helps to identify the most suitable supports and the most appropriate way to provide those supports. (ii) Some better off households are also allowed to join the interest groups in order to help the poor.	2011
	3. Forest protection and development plan	Government of VN	Forest environment service payment	All villages of Muong Nha have obtained payment for their forest protection activities carried out since the second half of 2013	N/A	2013
Ta Ma DB	1. World Vision project	World Vision	The World Vision project focuses on different supporting areas including education, medicine, assurance, capacity building, livelihood etc.	This project had provided 18 cows to villagers of 5 villages, such as Ke Cai (2 cows), Phinh Cu (6 cows), Hang Chua (2 cows), Tram Cu (6 cows) and Tho Ty (2 cows). To date, the provided cows have produce 112 cows	Rotating model of supported animal is suitable for development as beneficiaries were voted by villagers	2007-2025
	2. Planting Elephant grass project	Tuan Giao DPC	NA	This project emphasized on growing large areas of grass to feed animal but it was not successful as the requirement of field merge	Before doing project, social-economy information is first need; requirement of people and feasibility of the proposed solution	NA
Muong Tung DB	1. JICA project	JICA	Building irrigation system at Pom Cai village	The irrigation system has been working well and protect rice field from erosion and loss of mud/soil	NA	2010-2015

Survey site	Name of the program	Executing agency	Major activities/inputs	Major result	Lessons	Year/period of implementation
	2. The national project on afforestation of 5 million ha (program 661)	Government of VN	NA	The project has given a positive impact on forest recovering.	It is more difficult to Muong Tung in forest protection when the national road go through. It is very easy to consume forest product from firewood to logs, other NTFPs etc.	N/A
	3. Agriculture extension project	Muong Cha DPC	Support yellow banana seedling to local people	NA	This project did not give much impact and was not sustainable when too much of banana produced without buying market	N/A

Survey site	Name of the program	Executing agency	Major activities/inputs	Major result	Lessons	Year/period of implementation
Chieng Xuan SL	1. Northern Mountain Poverty Reduction Project	The World Bank	Livelihood, infrastructure, capacity building	The project implemented in 8 villages in the commune, the project provided cows to poor families, construction of traffic infrastructure such as bridges and irrigation systems for production activities.	The project staff worked directly with local people to implement the project without going through intermediary bodies such as communal authorities; People are directly involved right from the project development phase, especially they participated in designing the specific activities of the project that are suitable for themselves.	2010-2016
	2. KFW7	Entwicklungs bank	Forest establishment and management, community-based forest management, community development, support and training for extension services, and biodiversity Conservation	The project has only been implemented in the Kho Hong village, 16ha of Acacia has been planted since 2009 and can be harvested now	Sustainable forest management linked with the development of people's livelihood	2007-2014
	3. Forest protection and development plan	Government of VN	Build and develop protection forests and special-use forests. Develop production forest by expanding the links between farmers and enterprises of all economic sectors, investment into areas for material, product consumption	The project has supported 100,000VND/ha/year for protecting the natural forests of the commune, no occurrence of forest fires, slash-and-burn	Regulation on community forest management was developed, establishment of forest protection team and development of the village's forest protection fund	2011-2020
Muong Giang	1. Removal of	Government of VN	Support poor households with stable and safe	The project supported 53 households in the villages of the commune with the amount of VND	The project just satisfied people's need in terms of accommodation but not their livelihood	2008-2015

Survey site	Name of the program	Executing agency	Major activities/inputs	Major result	Lessons	Year/period of implementation
SL	temporary houses program		accommodation	7.2 million/ household to construct a new house. The result is 53 households in the communes renovated their houses for stable living condition.		
	2. Program 30A	Government of VN	Support sustainable agro-forestry production; build socio-economic infrastructure suitable to each district's characteristics; and restructure local economies and shift to effective production forms under planning	- All poor households in Chau Quan and Nghe Tong hamlets were supported with loan amount of VND 5 million/ household with interest rate of 0% in 2 years to buy cattle and goats for living improvement; hundreds of farmer households in these hamlets escaped from poverty	Investment in livestock development for people's livelihood improvement is the right direction and receiving strong support from people. However, for more effective development of livestock, veterinary and grazing should be considered for further investment.	2009-2016
Ban Lam SL	1. Northern Mountain Poverty Reduction Project	The World Bank	Activities implemented in the commune under the project included upgrading and constructing new buildings, roads, irrigation, investment in livelihood development	The project supported the construction of 5.6 km of concrete road for travelling in the villages, four small irrigation works. Regarding investment in livelihood development, so far 633 households have been provided loans for livelihoods with the total amount of VND 13.5 billion. The borrowers use the loans to invest in livestock and agricultural production, such as buying more cattle and pigs for breeding and seedlings of fruit trees such as late ripening longan and coffee. The project organized 5 training courses on techniques of farming and agricultural and forestry production for 100 farmer households. Such techniques have been effectively applied by farmers in their family, contributing to generating income.	The project's priority on supporting the needs of women is an innovative feature of the project. The villagers have directly involved in from the project preparation and proposals to project implementation, management, and monitoring and payment settlement	2010-2016
	2. KFW7	Entwicklungsbank	Forest establishment and management, community-based forest management, community development, support and training for extension services, and biodiversity Conservation	The project has invested in 528 ha of forest for pine (500 ha) and camellia (28 hectares) plantation with the participation of hundreds of households. Currently, these plants have grown well and people actively care for and protect the plantation.	KFW7 supported seedlings and rice for people. Selection of appropriate plants with high economic efficiency will encourage farmers to grow and care for them	2007-2014
	3. Forest protection and development plan	Government of VN	Build and develop protection forests and special-use forests. Develop production forest by expanding the links between farmers and enterprises of all economic sectors, investment into areas for material, product	1,427 ha of forest generation of the commune have been well protected, 18 village communities has been taken part in the forest management and protection	Communities in the commune are assigned for forest management, thus promoting their power in forest protection. Villages should develop regulations on forest management and protection and disseminate to each household in the village.	2011-2020

Survey site	Name of the program	Executing agency	Major activities/inputs	Major result	Lessons	Year/period of implementation
			consumption			

Survey site	Name of the program	Executing agency	Major activities/inputs	Major result	Lessons	Year/period of implementation
Nam So LC	1. Program 661	Government of VN	Forest environment service payment	In the past 5 years, each village of Nam So commune has been received those two payments then divide them evenly to each household in their village	Those two payments are regarded to have an important impact on enhancing local people's awareness and actions in protecting their forest	2011
	2. Forest protection and developmen t plan	Government of VN	Forest protection payment			2012
Pha Mu LC	N.A		Forest protection payments and forest environment service payment	The payments have helped Huoi Bac form a forest protect team who is responsible for preventing any illegal activities such as slash-and-burn, illegal forest burning, illegal logging etc.	Communal officials report that making those payments to local households have increased their awareness in practicing their forestry relating activities.	2008-2016
Phang So Lin LC	1. Program 135	Government of VN	The Program 135- Phase II and The World Bank	Which supports poor households in the commune in order to help pull them out of poverty and hunger (Program 135); Developing cattle rearing models for poor and near-poor households	In the last 5 years, the enactment of those aforementioned payments has assisted in increasing the local people's awareness and safe practice with regard to forestry, which could be a reason for the fact that no forest fire has occurred in recent years.	2011-2015
	2. Northern Mountain Poverty Reduction Project	The World Bank	The project provided support to these households to develop the models of buffalos, chickens and pigs raising as well as cultivation.	In Lo To Phin village, two households were aided one buffalo and 12 households have received 6 buffaloes so far at the point of data collection. In addition, each household would be provided with 5 chickens, making a total of 15 households having received this animal since 2010. Two pigs were given to each household and 20 households have been delivered pigs since 2010. The villagers were also trained of raising technique and aided of fertilizer, maize/rice seeds for cultivation. The village distributed the quantity of fertilizers evenly to all households.	The program has not shown effectiveness yet as some households' animals were killed by robbers or died of epidemics	2010-2016

Survey site	Name of the program	Executing agency	Major activities/inputs	Major result	Lessons	Year/period of implementation
Ngoc Lau, HB	1. Program 135	Government of VN	Livelihood, infrastructure, electricity cost, and salt etc.	N/A	Good lessons from this project include: focusing on the poor and actual needs of the community so as investments bring instance achievement which could be measure as the case of road or school building and irrigation system upgrade; Beneficiaries selection is transparent and democratic; Every village receives supports. On the other hand, there are also some lessons that local people believe should be taken into account and to improve in future project. (i) Employ more bottom-up approach and community based approach. This helps to identify the most suitable supports and the most appropriate way to provide those supports. For instance, salt provision is not effective because salt is too big for people to cook; maize variety VN 989 seed provision is not productive as people expect; (ii) Pass every management and implementation authority to commune level for better running	N/A
	2. Northern Mountain Poverty Reduction Project	The World Bank	This project provides assistances to 13 villages in the commune with focus on the poor household by supporting livelihood, providing fund to build village roads, reservoir and small irrigation system	N/A	Good experiences from this project as local leaders evaluate are: (i) Improving capital management, plan building and plan management for local people; (ii) Creating larger social network so as people could learn, cooperate and monitor each other; (iii) Transparency, democracy, equality with bottom-up approach; and (iv)Providing suitable and effective intervention for local people. On the other the hand, there are also problems which are expected to improve in future projects. These include the following: (i) Give full management authorities to commune level to save time for screening and appraisal;(ii) Providing people all necessary skills and training before asking them to monitor project activity – for instance, people's monitoring on road construction would be not effective when they know very little about concrete mixture; (iii) If financial resource is limited, a project should focus on a target village or target group instead of too large beneficiaries	2010-2016
	3. Coffee plantation project	Thai Hoa coffee company	In 2010, Thai Hoa coffee company initiated a coffee planting project in the commune via a shareholder model. Local people contribute land while the company invests on seeds, fertilizer and technologies. This project acquired about 150 hectares of farming land in Khop village.	This project is reported to fail by local CPC because of no harvest after 6 year planting.	The failure of this project is believed because land and weather conditions in the commune are not suitable for coffee trees. Local people were not consulted sufficiently and risk management was not taken into consideration.	2010

Survey site	Name of the program	Executing agency	Major activities/inputs	Major result	Lessons	Year/period of implementation
Pa Co, HB	1. Program 135	Government of VN	This project provides supports for poor households in the commune with credit, health care, infrastructure improvement (road, reservoir, etc), crop seeds, farming technique and livestock	130 poor household in the commune have borrowed from this Program with total 2.9 billion VND with low interest loans for the poor and the near-poor	Good lesions from this project are: (i) Focusing on the poor, the near poor and actual needs of the community so as investments bring instance achievement which could be measure as the case of road or school building or water reservoir; (ii) Beneficiaries selection is transparent and democratic; (iii) Crop productivities have increased quite substantially; and (iv) Accessibilities have been improved as car, electricity and water are accessible in all 7 villages. On the other hand, there are also some lessons that local people believe should be taken into account and to improve in future project. These include the following: (i) Employing more bottom-up approach and community based approach. This helps to identify the most suitable supports and the most appropriate way to provide those supports. It is reported that provided oxen died after provision because they were not familiar suitable to local weather condition, as people believe; (ii) Provided supports should be selective focusing on some areas instead of covering so many activities at the same time; (iii) Capacity building, financial management training and market training have not been adequately taken into consideration as the project over-emphasizes physical investment.	N/A
	2. Northern Mountain Poverty Reduction Project	The World Bank	This project provides assistances to 7 villages in the commune with focus on the poor household.	N/A	Good experiences from this project as local leaders evaluate are: (i) Improving capital management, plan building and plan management for local people; (ii) Creating larger social network so as people could learn, cooperate and monitor each other; (iii) Transparency, democracy, equality with bottom-up approach. People are free to select oxen in surrounding communities and the project allow them to buy from their network and pay for actual cost; (i) Providing suitable and effective intervention for local people. The good example is the development of oxen population in the commune. Oxen are suitable with local conditions especially when key farming is just for one crop so as people have time to take care of their livestock. On the other the hand, there are also problems which are expected to improve in future projects. These include the following: (ii) Providing people all necessary skills and training before asking them to monitor project activity. For instance, people's monitoring on road construction would be not effective when they know very little about concrete mixture; (iii) There should have been more interactions between the project and the people. Justify clearly people's proposals and see if they are sustainable or at high risk. Failure in pig raising is an example. Many pigs died because local condition are not suitable for large scale raising (weather is too cold in winter; people are not yet familiar, and not trained well enough for pig caring).	2010-2016
	3. Handicraft developmen t project	Ireland embassy	Providing jute seeds, warp frames and stitches to local women access to alternative income from selling their	25 selected households were beneficial	Project is not considered successful since people do not have land for jute planting and market study is not carried so as people's products are not able to approach market. Meanwhile, 25 selected households are from different villages in the commune so as it does not really create an active professional	2013

Survey site	Name of the program	Executing agency	Major activities/inputs	Major result	Lessons	Year/period of implementation
			products for tourists on the one hand, and to maintain their traditional cultural on the other the hand		network among members.	
Tien Phong, HB	1. Forestation project	Da Bac DPC	Support local people to plant chinaberry tree in two villages including Mat and Da Bia	Baby trees were provided to all villagers in these two villages with total area of 10 ha	This project is not effective as people were not trained carefully before planting. Meanwhile, crop cycle of the tree is too long without intermittent harvest so as some people have replaced with bamboo or maize. The failure of this project is thought to be result of the top down approach that do not take local people socio-economic condition into careful consideration. There is no accompanied livelihood supports for people to develop and to maintain this plantation until it is ready for harvesting.	2015
	2. Program 135	Government of VN	This project provides supports for poor households in the commune with credit, health care, infrastructure improvement (road, reservoir, etc), crop seeds, farming technique and livestock. The most credit program is water pipe and reservoirs provision for all villages in the commune	N/A	Good lesions from this project are: (i) Focusing on the poor, the near poor and actual needs of the community so as investments bring instance achievement which could be measure as the case of road or school building or water reservoir; (ii) Beneficiaries selection is transparent and democratic; (iii) Crop productivities have increased quite substantially. On the other hand, there are also some lessons that local people believe should be taken into account and to improve in future project. (i) Taking local socio-economic condition into consideration. This helps to identify the most suitable supports and the most appropriate way to provide those supports. (ii) Provided supports should bring people benefit in short term as people do not have sufficient capital investment for long term; and (iii) Priorities should focus on upgrading remaining 10 kilometer road that connect the commune with district town and building one market in the commune.	N/A
	3. Northern Mountain Poverty Reduction Project	The World Bank	This project provides assistances on raising fish cage, and goat to the poor villagers whose houses are adjacent to Da river	N/A	Good experiences from this project as local leaders evaluate are: (i) Provisions are suitable with natural condition of the commune. Goat and baby fishes are suitable and beneficial as they bring people income within one year; (ii) People are provided all necessary training before initiation; and (iii) Transparency, democracy, equality with bottom-up approach. People are free to select oxen in surrounding communities and the project allow them to buy from their network and pay for actual cost. On the other the hand, there are also problems which are expected to improve in future projects. (i) Beneficiaries are the poor only, while list of poor household is made in previous so as some non-poor receive support why “truly poor” do not; and (ii) The project should have provided people access to market more directly without having to go through boat business people.	2010-2016

A.2 Result of the Stakeholder Meetings

1. Rationale and Purpose of Stakeholder Consultation

JICA guidelines on environmental and social considerations state the importance of; developing and implementing environmental and social safeguards from an early stage in project planning, early information disclosure and meaningful stakeholder participation in project design and implementation. Thus, Site-level and Provincial Stakeholder Consultation Meetings were conducted during the preparatory survey in June-July 2016.

The project is classified as a Category B which requires to conduct stakeholder meetings 'when necessary' (rather than as a pre-determined requirement as per Category A projects). In this case, the Environmental and Social Safeguards Specialists deemed site-level consultation with local stakeholders to be good practice in line with the spirit of the JICA guidelines and environmental and social principles, in appropriate and necessary consideration of the large number of ethnic minority people in the project area and associated potential social issues related to access to lands and resources and loss of livelihoods. The site-level stakeholder consultation meetings provided an opportunity to receive local comments and feedback on the appropriateness and feasibility of proposed project interventions as well as further relevant perspectives on social issues and impacts.

The site-level stakeholder consultation meetings were carried out by a Sub Contractor under the guidance and supervision of the preparatory survey team. The specific objectives of the meetings were as follows:

1) To disclose information on project activities to local stakeholders at an early stage in project preparation,
2) To provide an opportunity for local stakeholders to provide comments and feedback on the appropriateness and feasibility of proposed activities and interventions,
3) To invite local participation in the assessment of environmental and particularly social benefits and risks associated with the project, and
4) To confirm the willingness of local stakeholders to participate in the project.

Comments and feedback from the stakeholder consultation process have been noted and have been integrated to the final analysis and assessment of project-related environmental and social issues as well as measures intended to enhance benefits and mitigate risks.

2. Approach and Contents of the Stakeholder Consultation Meetings

The workshops were divided into 4 main sections, which respond to the key objectives:

1) Project Information Disclosure:

In the first session the Sub Contractor presented information on the features of the proposed project including:

- Project stage and development process
- Project rationale and objectives
- Size and scope of the Project
- Geographical coverage and project sites
- Project approaches and strategies
- Project components and activities

Time was provided for clarifications and questions. A project information handout was also provided to workshop participants.

2) Appropriateness/Feasibility Consultation:

In the second session which was done using a participatory group work approach, local stakeholder participants provided comments on the project components, activities and approaches/strategies and their appropriateness/feasibility in the local context. Meanwhile at provincial level comments and feedback were received in a plenary/roundtable format.

3) Assessment of Environmental and Social Benefits and Risks:

In the third session, a presentation on environmental and social considerations was made. Then local stakeholders were asked to identify and confirm potential environmental and social risks associated with the project and suggest appropriate mitigation measures. With time constraints local level stakeholders focused mainly on social safeguards issues related to forest development components. Meanwhile at provincial level comments and feedback were received in a plenary/roundtable format.

4) Confirmation of willingness to participate:

At the end of the meeting, all participants were requested to complete a 'voting slip'. As representatives of their respective agencies and jurisdictions, participants confirm whether they are willing to participate in the project or not.

3. Meeting schedule and Stakeholders Consulted

The stakeholder meetings were held June 21- July 8, 2016 at 3 sites in each province and 1 provincial meeting at each province. In the each stakeholder meetings, the following stakeholders have participated.

The schedule and the list of participants and the number of participants in the each meetings is shown in the **Table A-1** of this Annex. Around 25-40 participants have attended for the each site-level meeting, and provincial meetings.

Stakeholders Consulted

Type	Category	Major participants
Site level consultation meetings	Provincial government	DARD, sub-department of Forestry
	District government	DPC, DiARD, Forest Ranger Station
	Forest Management Board	PFMB, NRMB
	Commune administration	Leaders and staff CPCs
	Mass organisations	Leaders of Communal Women Unions
	Representative of local people	Villagers (farmers)

Type	Category	Major participants
Provincial Consultation meetings	Provincial government	DARD/SubDoF, DONRE, Department of Ethnic minority
	District government	DPC, DiARD, DiONRE,
	Forest Management Board	Dien Bien, Muong Cha and Tuan Giao Protection Forest Management Board
	Mass organisations	Provincial Women's Union

Source: JICA3 preparatory survey team

4. Summary of Key Comments and Feedback

(1) Comments and Feedback on Basic Project Design

The following table summarizes the key comments and feedback on the project objectives, design and component. Generally, the proposed project outlines were agreed by the stakeholders, however, it was not easy for the participants to fully understand the impact of the project to their lives as it was the first meeting to be given the project information.

Above all, various fruitful opinions, worries, expectation and suggestions could be collected from the participants.

Major comments/feedbacks given in the stakeholder meetings

Project Component	Major comments/feedback
1) Forest Development Components	Dien Bien ◆ As identification of forest/land boundaries is important, necessary budget for this activities should be also considered. ◆ Support on village regulations on land use and forest utilization should be implemented first, at the beginning of the project. ◆ There was an argument that forest inventory at target sites is not necessary, as national forest inventory activities were conducted recently and the data has been updated. ◆ Considering that crop cultivation has been carried out in the land area categorized as "bare land" in reality, it is not easy to conduct afforestation activities. In case of implementation, the land users in the target site should be definitely included as the actors of afforestation and protection activities to be paid. ◆ Capacity building and training for village protection teams will be essential. ◆ Equipment should be given to the forest ranger stations for forest fires control activities. Lai Chau ◆ Including too many communes in each district may limit the scale of each activity as well as creating difficulties in project management and increase of project cost. Son La ◆ Participation of local people for forestry inventory and planning is essential, and the detail land use map with clear boundaries should be provided to local communities. ◆ The payment should be allocated based on actual contributions of each community with transparent and fair manner. ◆ Prefer to move the budget of silvicultural infrastructure to livelihood improvement component as the effectiveness of those is not very clear. ◆ Very important to pay special attention and communication for the local people who still use fire to clear the fields. ◆ As the forest fire is huge, forest fire control equipment will not be effective to prevent anyway. ◆ It is also important to have wide fire prevention corridors to be able to prevent fire in strong wind. ◆ For patrolling, vehicles and associate equipment such as uniform, walkie-talkie will be necessary. ◆ There is a land conflict in Ca Nang village and neighboring communes in Thanh Hoa. It is necessary to take this into consideration. ◆ Priorities should be given to indigenous species; when planting new species, better to conduct pilot planting. ◆ There were some suggestion to modify the target areas (Increase protection forest site of Tan Xuan commune in van Ho district; Reduction of afforestation area in Chieng Bom commune considering another project going on in the same commune; Increase

Project Component	Major comments/feedback
	afforestation area in Van Ho district; proposed target area in Xuan Nha is too small) Hoa Binh ◆ Priorities should be given to indigenous species. ; when planting new species, better to conduct pilot planting. ◆ Participation of local people for forestry inventory and planning is essential, and the detail land use map with clear boundaries should be provided to local communities. ◆ For patrolling, vehicles and associate equipment such as uniform, walkie-talkie will be necessary. ◆ There were some suggestion to modify the target areas (Reduce the afforestation in Nam Son and Bac Son seem too large; need to add Thai Thinh commune, Hoa Binh city and downstream communes of Hoa Binh Dam.)
2) Livelihood Improvement Components (including small scale infrastructure)	Common4 provinces ◆ For the implementation, local people can contribute their manpower for the works; the project provides materials and techniques; CPC plays a role of monitoring. Dien Bien ◆ Participants agreed in general that small scale infrastructure support is mainly upgrading the existing facility. ◆ It is expected for the all participating villages to have at least one small-scale infrastructure investment. As for the road improvement, it is requested to include particularly upgrading the entrance path to villages. Lai Chau ◆ Upgrading road is the most priority needs in general, and needs of rehabilitation of water supply facility follows. Son La ◆ Not necessarily to support small scale infrastructure in all communes, rather better to concentrate into several communes with larger scale. ◆ Connecting road from commune center to village will be helpful to improve accessibility. ◆ Irrigation system with community based management model is helpful. ◆ Holistic support with linking infrastructure-livelihood development -improvement of marketable crop production supports in model commune will be effective. Hoa Binh ◆ Holistic support with linking infrastructure in model commune will be effective instead of covering all target communes with small scale. ◆ Irrigation system with community based management model is helpful. ◆ Holistic support with linking infrastructure-livelihood development -improvement of marketable crop production supports in model commune will be effective.
	Common4 provinces ◆ Planting medicinal plants/spice trees is very good. It is important to define the suitable species, particularly local, long-term species. Dien Bien ◆ Improved cooking stove is suitable for Thai ethnic household, but does not fit with H'mong ethnic group due to the difference of traditional lifestyle. ◆ Biogas utilization is suitable with better-off households at low land area only. ◆ Vegetable garden is not applicable to the places with lack of water supply. ◆ Fruit tree plantation can be applied in home gardens, but not necessarily with large scale, considering the market. ◆ Plantation of medicinal plants in protection forests is highly appreciated. ◆ Supports on marketing of agriculture product is very important. ◆ Appreciate to include cattle raising activities. Lai Chau ◆ Generally agreed. The supports which participants showed their interests most are technical training on vegetable cultivation, and cattle raising models, with marketing supports. ◆ Regarding fuel saving solutions, the difficulty of installation of biogas facility in terms of necessity of large investment ad requirement of continuous maintenance, although its effectiveness is attractive. As for fuel saving cooking stove, it is useful, but not necessarily applicable to all ethnic groups. Son La ◆ Prefer to be supported with new high productivity crop seeds for maize; cow and pig raising. ◆ Market networking and capacity building will be effective. ◆ Support of processing facility which can be used commonly among several communes will be helpful. ◆ Study tour is effective.

Project Component	Major comments/feedback
	◆ Selection of the supporting options should be fully discussed with the local communities. Hoa Binh ◆ It is important to pay attention to support poor household. ◆ Support of processing facility which can be used commonly among several communes will be helpful. ◆ Wish to have the support to open a farm-input material shop at commune level. ◆ Prefer to be supported with new high productivity crop seeds for maize; cow and pig raising.
3) Others: - General Project Design/Objectives	Common for 4 provinces ◆ Overall project design and framework was generally agreed, appropriate for forest protection and development, and livelihood improvement. ◆ As the needs and condition are different from commune to commune /ethnic group to group, the project approach, methodologies and intervention should be flexible. Dien Bien ◆ The project is a good opportunity for forest improvement in the target area. ◆ Project beneficiaries should be emphasized on the people living in the forest area. ◆ Project implementation areas should be increased. For instance, it is expected to add 500ha of ANR area in Muong Phang NR. Son La ◆ Better to include all communes in each target site. ◆ Expect to increase the forest protection fees to be paid for the local communities as the current fee does not motivate people to participate in. ◆ Need of increasing budget for livelihood activities and small scale infrastructure development as they are essential for promoting the forest protection activities. Hoa Binh ◆ Recommend to increase the project area (i.e. all 20 communes in Song Da protection forest area while only 11 communes are proposed in the project design; to include 800ha of natural forest in Hien Luong.) ◆ Expect to increase the forest protection fees to be paid for the local communities as the current fee does not motivate people to participate in. ◆ Need of increasing budget for livelihood activities and small scale infrastructure development as they are essential for promoting the forest protection activities. ◆ It is better to concentrate into several communes to support with larger scale, to bring larger impact.
-Information Dissemination & extensions)	Common for 4 provinces ◆ Concise and clear information on benefits and duties should be clearly provided to the population in the target area, at right timing. ◆ It is important to design different dissemination channels to fit different stakeholders (ethnic group, women, the poor, farmers, province/district/commune/village level, etc.) Dien Bien ◆ It is better to train village heads in advance. ◆ It is important to coordinate well with other projects/program. Lai Chau ◆ Project framework and design was generally agreed. Son La ◆ It is effective to involve women, youth and farmer's unions to take leading role in disseminating project related information. ◆ Quantitative indicator for project objective should be set for making the target clear. Hoa Binh ◆ It is effective to involve women, youth and farmer's unions to take leading role in disseminating project related information.

Source: JICA3 preparatory survey team (2016)

Those comments given in the stakeholder meetings were carefully considered to examine the overall project design and each project component.

(1) Comments and Feedback on Environmental and Social issues

The following table summarizes the key comments and feedback on environmental and social issues. As it was an initial consultation during the process of project designing without having

information of detail information for each commune, not many constructive comments and feedback could not be shared by the participants. However, in general, it could be understood that the participants fear the land conflicts over benefits given by the project. In order for avoiding to create conflicts, it is important that the concise and clear information on benefits and duties should be clearly provided to the population from the early stage of the project.

Major comments/Feedbacks given in the Stakeholder meetings on Environmental and Social Risks

Project Component	Major comments/feedback
1) Overall comments	Common for 4 provinces ◆ Concise and clear information on benefits and duties should be clearly provided to the population in the target area. ◆ Common explanation even for women and illiterate ethnic minorities.
2) Forest development Component	Dien Bien ◆ The following risks were raised by the participants. (relating to land) Fear of loss of farming land, increment of conflicts over boundary between villages, and among household in a village, increment of forest encroachment in neighboring communities, (relating to livelihood) conflicts over benefits given by the project activities, reduction of land for food crop cultivation, reduction of area for cattle grazing, loss of right for logging of timber for building/fixing private house, (other social issues) women and old people have less opportunities to participate in the project activities, poor households will be affected due to limitation of collection NTFP. Lai Chau ◆ It is not necessarily that the official data and the reality in the field is not consistent. Thus, it is important to share the all results of forest inventory and planning for villagers and confirmed. Participatory forest planning process is inevitable. ◆ Considering that crop cultivation has been carried out in the land categorized as "bare land" in reality, the land users in the target site should be definitely included for afforestation and protection activities to be paid. Son La ◆ Detail planning for each village will be necessary to prevent confusion later. ◆ To avoid jealous of non-participating communes, it is better to allocate a certain annual budget for all communes. Hoa Binh ◆ Potential land/territory disputes among households/villages/communes. ◆ To avoid jealous of non-participating communes.
3) Livelihood Improvement component	Dien Bien ◆ Do not create any environmental risks, as the small scale infrastructure support is for upgrading, not newly construction. ◆ Inequality between project target beneficiaries and non-beneficiaries. Son La ◆ Jealous or dispute between those who receive supports and who do not.

Source: JICA3 preparatory survey team (2016)

5. Results of voting slip

At the end of the meeting, all participants were requested to complete a 'voting slip'. As representatives of their respective agencies and jurisdictions, participants confirmed whether they are willing to participate in the project or not. As a result, except 1 person, all participants agreed and showed interests in participate in the project.

Results of the Voting Slip

Province	Meeting site	Total votes	Yes	No	% of Yes
Dien Bien	Muong Cha & DB PRMB	27	27	0	100%
	Tuan Giao PFMB	16	16	0	100%
	Provincial meeting	24	24	0	100%
	TOTAL	67	67	0	100%
Lai Chau	Nam Ma and Nam Na PFMB (Sin Ho district)	30	29	1	97%

Province	Meeting site	Total votes	Yes	No	% of Yes
	Tan Uyen PFMB (Tan Uyen district)	21	21	0	100%
	Than Uyen PFMB (Than Uyen district)	25	25	0	100%
	TOTAL	76	75	1	99%
Son La	Copia NR, Thuan Chau PFMB (in Thuan Chau district)	36	36	0	100%
	Quynh Nhai PFMB (Quynh Nhai district)	31	31	0	100%
	Xuan Nha NRMB (Van Ho district)	27	27	0	100%
	Provincial meeting	30	30	0	100%
Hoa Binh	Da River PFMB, Phu Canh NRMB (Da Bac district)	43	43	0	100%
	Hang Kia Pa Co NRMB (Mai Chau district)	37	37	0	100%
	Ngoc Son Ngo Luong NRMB (Lac Son district)	37	37	0	100%
	TOTAL	117	117	0	100%

Source: JICA3 preparatory survey result (2016)

The reason why one voter did showed unwillingness to participate in the project was that their commune has devoted tea plantation in a part of forest land area under the project which has been operated by tea estate, collaborating with the provincial government. According to the facilitator, there were other two participants who pointed out the same, however, they did not disagree, realizing that there are more forest land to be protected under this project, and no need to worry about the loss of tea plantation due to the project implementation.

Tables

Table A-1 Schedule and Participants of the Stakeholder Meetings

Date	*Location/Venue*	*Participants*	*No. of participants*
【Dien Bien Province】			
24-Jun-16	Office of Dien Bien DARD	Dien Bien DARD (2), Sub-Department of Forestry (1), Dien Bien DPC (1), Dien Bien DiARD (1), Muong Cha DiARD (1), Dien Bien Forest Ranger Station (1) and Muong Cha Forest Ranger Station (1);	27
		Forest Management Board: Dien Bien PFMB (2), Muong Cha PFMB (2); Muong Phang NC (2)	
		Commune Gov. staff: Leaders and staff CPCs of Muong Nha (2), Na Tong (2), Phu Luong (2) and Muong Tung (2), Muong Phang (2) and Pa Khoang (2).	
		Mass organisations: Leaders of Communal Women Unions of Muong Nha (1), Na Tong (1), Phu Luong (1) and Muong Tung (1), Muong Phang (1) and Pa Khoang (1) commune	
		Local famers: Muong Nha (1), Muong Tung (1)	
27-Jun-16	Tuan Giao PFMB	Tuan Giao DPC (1), Tuan Giao Ranger Station (1)	16
		Forest Management Board: Tuan Giao PFMB (3)	
		Commune Gov. staff: Leaders and staff of Ta Ma (3) and Phinh Sang (3)	
		Mass organisations: Leaders of Communal Women Unions of Ta Ma (1), Phinh Sang (1); Leaders of Farmer Union Ta Ma (1) and Phinh Sang (1)	
		Local famers: Ta Ma (01)	
29-Jun-16	Office of Dien Bien DARD	Provincial Gov. agencies: DARD (3), SubDoF (2), SubFPD (2), DiARDs (3), DONRE (3), DiONREs (3), Department of Ethnic minority (2), Dien Bien DPC (1), Tuan Giao DPC (1), Muong Cha DPC (1), DPI (1), Ranger stations (3)	24
		Forest Management Boards: Dien Bien (1), Muong Cha (1) and Tuan Giao Protection Forest Management Board (1), Muong Phang NC (1)	
		Mass organisations: Provincial Women's Union (2)	
【Lai Chau Province】			
01-Jul-16	Sin Ho district's meeting room	Forest Management Board: Nam Ma PFMB (3), Nam Na PFMB (2)	30
		Commune: Hong Thu CPC (2), Pa Tan CPC (2), Sa De Phin CPC (3), Sin Ho Town's people's committee (2), Chan Nua CPC (2), Nam Han CPC (2), Tua Sin Chai CPC (2), Phan so Lin CPC (1), Nam Cuoi CPC (2)	
		Mass organizaions: Pa Tan communal women Union (1), Sa De Phin communal women union (1), Tua Sin Chai communal Women's Union (1), Chan Nua Commune women's union (1), Sin Ho town's women's union, Nam Han commune women's union, Nam Cuoi commune's vietnamese fatherland Frong	
05-Jul-16	Tan Uyen district's meeting room	Forest management board: Tan Uyen PFMB (2) forests guard in Hua Chang village (Tan Uyen Town)(1)	25
		Commune: Ta Mit CPC (2), Nam Can CPC (3), Tan Uyen town's people's committee (1), Tan Uyen town (2), Nam So CPC(1), Nam So CPC(1), Muong Khoa CPC (3)	
		Mass organizations: Ta Mit commune's women's union (1), Muong Khoa commune's farmer's union (1), Muong Khoa commune's women's union (1), Nam Can Commune's women's Union (1), Tan Uyen town's women's union (1), Nam So commune's women's union (1)	
		Team leader of Forest Protection Team in Dan Tuyen Village- Nam So Commune (1), village head of It Chom Tren village (Ta Mit commune), village head of Hua Can Village (Nam Can Town)	
06-Jul-16	Than Uyen district's meeting room	Forest management Boards: Than Uyen PFMB (3)	25
		Communes: Khoen On CPC(3), Pha Mu CPC (3), Muong Mit CPC (3), Ta gia CPC (1), Muong than CPC(3)	
		Mass organization: Khoen On commune's women's union (1), Pha Mu commune women's union (1), Muong Mit commune women's union (1), Muong Than commune women's union (1), Ta Gia commune women's union(1)	
		Village: On village (Khoen On commune) (1), Ve village (Muong Mit commune) (1), Hoa Than village (Muong Than commune) (1), Xa Cuong I village (Ta Gia commune)(1)	
08-Jul-16	Lai Chau Province's	Province: DARD (Lai Chau province) (5), Lai Chau ethnic council (2), PAEC (2), DONRE (1)	20
		Forest Management Board:Nam Ma PFMB (2), Nam Na PFMB(2), Tan Uyen FPMB (2), Than Uyen FPMB(2)	
		Mass organizations: Lai Chau Farmer's union (2), Dept. of Propaganda and training of Lai Chau women's union (1)	

Table A-1 Schedule and Participants of the Stakeholder Meetings

Date	*Location/Venue*	*Participants*	*No. of participants*
【Son La Province】			
29-Jun-16	Thuan Chau district	Forest Management Board: Copia Natural Reserve MB(2), Thuan Chau protection forest MB(2)	36
		5 Communes: Chieng Bom(4) , Co Ma(4), Long He(4), Ban Lam Muong Bam(4), Nam Lau(4). (chairman or vice chairman of CPC(1), official in charge of agriculture and forestry (1), official in charge of land management (1), leader of Commune WU(1))	
30-Jun-16	Quynh Nhai district	Forest Management Boards: Quynh Nhai protection forest MB (4)	31
		6 communes: Ca Nang, Mieng Chieng, Pac Ma, Pha Khinh, Muong Giang, Muong Sai. Each commune: 4 participants (1 chairman or vice chairman of CPC; 1 official in charge of agriculture and forestry; 1 official in charge of land management; 1 leader of Commune WU)	
04-Jul-16	Van Ho district	Forest Management Boards: Xuan Nha Natural Reserve MB (4)	27
		4 communes: Chieng Xuan(5), Tan Son(5), Xuan Nha(5), Chieng Son(5). (1 chairman or vice chairman of CPC; 1 official in charge of agriculture and forestry; 1 official in charge of land management; 1 leader of Communal WU; 1 head of forest protection team)	
06-Jul-16	Son La city	DARD (Vice-director)(1), Forest Protection Department (2)(1Leader, 1Technical), PAEC (1), DoNRE (3), Council for Ethnic Minority Affairs (2) , women's union (2), farmer's union (2)	30
		Forest Management Boards: Thuan Chau PFMB, Quynh Nhai PFMB, Copia NR, Xuan Nha NR (2 each; 1Leader, 1Technical)	
【Hoa Binh Province】			
21-Jun-16	Phu Canh Nature Reserve headquarters (Da Bac district)	Forest Management Boards: Da River PFMB (2) (1director and head of technical division); Phu Canh NR office (2) (1director and head of technical division), Da Bac Ranger station (1), Da Bac agriculture division(1)	43
		9 communes: Dong Chum(3), Tan Pheo(3), Dong Ruong(3), Doan Ket(3), Dong Nghe(3), Muong Chieng(3), Suoi Nanh(3), Tien phong,(3) Vay Nua(3) (each commune 3participants (1Chairman of CPC, 1official in charge of agriculture and forestry; 1leader of Communal Women Union).	
23-Jun-16	Han Kia Pa Co Nature Researve headquarters (mai Chau district)	Forest Management Boards & District: Hang Kia Pa Co Natural Reserve (3) (1vice director, 1head of technical division, 1member of forest protection team)	37
		Districts: Mai Chau DPC(1), Mai Chau DAEC (1), Tan Lac DAEC(1), Mai Chau Ranger station(1)	
		8 communes: Hang Kia, Pa Co, Tan Son, Ba Khan, Tan Mai, Trung Hoa, Ngoi Hoa (each commune 3 participants: 1Chairman of CPC, 1 official in charge of agriculture and forestry ; 1leader of Communal Women Union).	
24-Jun-16	Ngoc Son-Ngo Luong Nature Researve headquarters (Lac Son district)	Forest Management Boards: Ngoc Son Ngo Luong Natural Reserve MB (4) (vice director, head of technical division and 2 member of forest protection team), Lac Son Ranger station(1), Tan Lac Ranger station(1)	37
		District: Lac Son DPC(1), Lac Son district DiARD(1); Tan Lac DPC(1), Tan Lac district diARD(1)	
		7 communes : Ngoc Lau, Ngoc Son, Tan My, Tu Do, Ngo Luong, Nam Son, Bac Son (each commune 3 participants :1 Chairman of CPC, 1 official in charge of agriculture and forestry ; 1 leader of Communal Women Union).	
27-Jun-16	Hoa Binh DARD	Vice director of DARD, Forest Protection Department (1 Leader , 1technical), Agriculture Extension Centre (1 Leader, 1 technical), DoNRE (1 Leader, 1 EIA department leader, 1 EIA technical), Council for Ethnic Minority Affairs (1 Leader , 1 technical), Women's Union (1 Leader , 1technical), Farmer's Union (1 Leader , 1 technical)	30
		The leader of Da River PFMB, Hang Kia Pa Co Natural Reserve, Ngoc Son – Ngo Luong Natural Reserve, Phu Canh Natural Reserve	

Annex B

Annex B Draft Terms of References (TORs) and Cost Estimates of the Activities of the Survey and Detailed Planning

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Annex B Draft Terms of References (TORs) and Cost Estimates of the Activities of the Survey and Detailed Planning

The component of "Survey and Detailed Planning" consists of the following activities:

- Participatory land use planning and formation of village working groups
- Site demarcation and set-ups of land marks
- Socio-economic baseline survey
- Detailed designing of forest development and improvement activities including improvement of silviculture infrastructure
- Detailed desining of small scale rural infrastructure

Among others, this annex first introduces the draft terms of references (TOR) of "Participatory Land Use Planning and Formation of Village Working Groups," and "Socio-economic Baseline Survey," and then outline the other works, namely "site demarcation and set-ups of land marks" and "detailed design works." Finally, the estimated costs required for implementation of the componet as well as the respective activies are described in the last chapter and tables attached in this annex.

B.1 Draft Terms of Reference (TOR) of Participatory Land Use Planning and Formation of Village Working Groups

B.1.1 Background

The Sustainable Forest Development Project in the Northwest Sub-region is a project newly proposed by MARD with an aim to i) restore and improve watershed forests for both environment and economic purposes, ii) strengthen the capacity of local governments as well as forest owners of watershed forests for sustainable forest management, and iii) contribute to the reduction of GHG emission through reduction of deforestation and forest degradation. The project will be implemented mainly in protection forests and special use forests selected in four provinces in the Northwest sub-region, namely, Dien Bien, Lai Chau, Son La, and Hoa Binh.

The main components of the project will be: i) survey and detailed planning, ii) improvement of watershed forests, iii) improvement of silviculture infrastructure, iv) improvement of small-scale rural infrastructure, v) support for livelihood improvement, vi) forest firecontrol, and vii)project management, and viii) consulting service.

The participatory land use planning and formation of community groups for forest development is a part of the activities planned in the Survey and Detailed Planning with an aim to identify and select the target areas for forest development in a participatory manner.

B.1.2 Objectives of the Work

The main objectives of the participatory land use planning (PLUP) and formation of village working groups are i) to select the project areas for forest development and improvement activities in close consultation with local communities, ii) to have prior consents to the use of the selected areas for forest development and improvement from communities, groups of households, and individual households who have legitimate land use rights or customary land use rights over the areas, and iii) to organize those who are willing to participate in the project and/or those who agree to use their areas for the project into working groups.

Specifically, the work aims to:

- Develop present land use maps of villages relating to the project areas based on GIS-based-cum-photo-like maps prepared by using the latest high resolution satellite images;
- Develop future land use maps of villages relating to the project areas with determination of areas which can be used for forest development and improvement activities, such as afforestation, assisted natural regeneration, and protection of natural forests;
- Identify and select households who have vested land use rights over the areas selected for forest development and improvement and who are willing to participat in the project activities;
- Verify if the areas selected can be used for the project on the ground with households who have vested land use rights over the areas;
- Organize households who are willing to participate in the project into village working groups, which will be the sub-contractors for the forest development and improvement activities; and
- Make an agreement with village working groups on forest development and improvement activities in the project areas.

B.1.3 Scope of the Work

(1) Major Activities

Major activities to be carried out in the participatory land use planning and formation of the village working groups are shown below.

Meetings at the commune level

- Consultation meetings with commune and village leaders to introduce the project activities, get their prior consent to the conduct of the activities, and identify villages geographically relating to the target protection forests/nature reserves
- Meetings with village leaders and other key informants to discuss the rules on the use and management of forests in the communes

Meetings at the village level

- Meetings with village leaders and households who have land use rights over the target protection forests/nature reserves in the respective villages to identify the areas which can be used for forest development and improvement activities
- Meetings with households and groups of households who have vested land use rights over the selected project areas to confirm their willingness to take part in the project and use the target areas for the project
- Meetings with those willing to use their lands for the project to organize them into village working groups

(2) Target Areas

The participatory land use planning and formation of village working groups shall be carried out in the respective villages which overlap its territories with the 10 target protection forests and six special use forests in the target provinces. A total of 64 communes are identified as the target areas for the activities as shown below.

Target Communes for PLUP and Formation of Village Working Groups

Province	Proposed Areas	District	Communes
Dien Bien	Dien Bien PF	Dien Bien	Na Tong, Phu Luong, Muon Nha
	Muong Cha PF	Muong Cha	Muong Tung
	Tuan Giao PF	Tuan Giao	Phinh Sang, Ta Ma
	Muong Phang SUF	Dien Bien	Muong Phang, Pa Khoang
Sub-total	**3PFs and 1SUF**	**3 districts**	**8 communes**
Lai Chau	Nam Na PF	Sin Ho	Hong Thu, Nam Cuoi, Nam Han, Nam Tam, Pa Khoa, Phang So Lin, Pu Sam Cap
	Nam Ma PF		Chan Nua, Lang Mo, Pa Tan, Sa De Phin, Ta Ngao, Tua Sin Chai
	Tan Uyen PF	Tan Uyen	Ho Mit, Muong Khoa, Nam Can, Nam So, Ta Mit, TT.Tan Uyen,
	Than Uyen PF	Than Uyen	Muong Mit, Pha Mu, Ta Mung
Sub-total	**4PFs**	**3 districts**	**22 communes**
Son La	Copia SUF	Thuan Chau	Chieng Bom, Co Ma, Long He
	Thuan Chau PF		Nam Lau, Muong Bam, Bam Lam
	Quynh Nhai PF	Quynh Nhai	Muong Giang, Muong Sai
	Xuan Nha SUF	Van Ho	Chieng Xuan, Tan Xuan, Chieng Son
Sub-total	**2PFs and 2SUFs**	**3 districts**	**11 communes**
Hoa Binh	Da River PF <1	Da Bac	Dong Nghe, Dong Chum, Don Ruong, Murong Chien, Murong Tuong, Suoi Nanh, Tien Phong, Vay Nura
		Tan Lac	Trung Hoa, Ngoi Hoa
		Mai Chau	Ba Khan, Tan Dan, Tan Mai
		Cao Phong	Thung Nai
	Ngoc Son–Ngo Luong SUF	Lac Son	Ngoc Lau, Ngoc Son, Tu Do
		Tan Lac	Ngo Luong, Nom Son, Bac San
	Hang Kia– Pa Co SUF	Mai Chau	Hang Kia
	Phu Canh SUF <1	Da Bac	Dong Chum, Tan Pheo, Dong Ruong, Doan Ket
Sub-total	**1PF and 3SUFs**	**5 districts**	**23 communes**
Total	**10PFs and 6SUFs**	**11 districts**	**64 communes**

Note: <1 Two (2) communes in Da River Watershed Protection Forest are also those relating to Phu Canh Nature Reserve.
Source: JICA Preparatory Survey Team (2016)

B.1.4 Methodologies of the Work

(1) Process of the Work

In each commune, the following meetings shall be organized and held at both the commune and village levels.

- Consultation meeting with commune leaders and leaders of villages
- Workshops/meetings on present land use mapping in the villages relating to protection and special use forests
- Workshops/meetings on selection of areas for forest development and development of future land use maps of the villages relating to protection and special use forests
- Workshops/meetings on formation of village working groups in the villages where the areas for forest development are selected

The meetings and workshops listed above shall be carried out as a package of the work to be carried out in each commune. The number of the workshops/meetings at the village level varies with the number of villages relating to protection forests / special use forests in each commune.

(2) Methodologies of the Participatory Land Use Planning (PLUP) and Formation of Village Working Groups

The meetings and workshops are listed in the previous section will be carried out in the following manner.

a. Procurement of satellite image

Prior to the field activity, CPMB will purchase a set of the latest-cum-high resolution satellite images covering the project areas in the target provinces to develop photo-like maps covering the target 64 communes, which will be used as base maps for determination of the project areas in consultation with local communities in the participatory land use planning. Considering the purposes of use and its purchasing prices, the preparatory survey judges that the following satellite images are suited for this purpose.

Satellite Images recommended for Forest Inventory and Mapping

Satellite images	Resolution	Target Area	Supplier
Pleiades (Pan sharpened and colored images)	1.0 m	4,681 km^2	The National Remote Sensing Department

Source: JICA Preparatory Survey Team (2016)

The procurement of satellite images will be done in the second year (2018/2019) of the project by CPMB with technical assistance of the project consultant. The activity can also be contracted out to the contractors which will implement PLUP and formation of village working groups.

b. Development of photo-like maps

Photo-like base maps covering the target communes will be developed and prepared on a scale of 1/5,000~1/10,000 by overlaying the existing GIS data of the topographic maps (such as contour lines, roads, rivers/streams, and boundaries of communes) collected from FIPI or DARDs concerned and those of the boundaries of the target protection forests/special use forests collected from PFMBs/SUFMBs concerned on the high resolution satellite images. Development of photo-like maps should be completed by the end of the second year so that the same maps can be fully used for PLUP. This activities will be incorporated into the activities contracted out to the contractor for PLUP and formation of village working groups.

c. Consultation meeting with commune leaders and leaders of villages

A one-day meeting shall be organized and held at the commune center with the participation of commune leaders and heads of villages in the commune mainly to have prior consent to the project and PLUP activities from commune and village leaders and to identify villages geographically relating to the potential project areas. The following topics shall be first introduced to the participants in the meeting.

- Objective and outline of the project
- Outline of the forest development activities
- Expected benefit and restriction on land use
- Aims and major activities of PLUP and formation of village working groups

Briefed on the project, the participants will identify the villages of which territories are overlapped with protection forests or special use forests and discuss rules on the use and management of forest and land resources in the commune, especially in protection forests/special use forests in the meeting. A draft agenda of the meeting are shown below.

Draft Agenda of the Consultation Meeting at Commune

Topic	Timeline
1. Opening Remark	08:00-08:10
2. Introduction of the project and project activities (including questions and answers)	08:10-09:00
3. Presentation of a photo-like map with boundaries of protection forests (PFs)/special use forests (SUFs) and identification of villages relating to PFs/SUFs	09:00-10:00
4. Coffee Break	10:00-10:15
5. Discussion on the rules on forest management and land use in protection forests or special use forests in the commune	10:15-11:30

Topic	Timeline
6. Lunch Break	11:30-13:30
7. Discussion on the rules on forest management and land use in protection forests or special use forests in the commune	13:30-14:30
8. Wrap-up and introduction of the next steps	14:30-15:00

Source: JICA Preparatory Survey Team (2016)

d. Preparation of a present land use map of the villages relating to protection forests and special use forests

A one-day meeting shall be organized and held at the villages geographically relating to protection forests/special use forests with the participation of village leaders, representatives of mass organizations, households who have legitimate land use rights over protection forests/special use forests or who have customarily used the same areas for farming and other purposes. The main aim of the workshop is to develop a present land use map of the village based on a photo-like map on a scale of 1/5,000 ~1/10,000. To this end, the participants shall have the following discussions.

Sessions/Discussions in the Meeting

Session	Description
Session 1 Introduction	Introduce the outline of the project, project activities (especially forest development activities), aims and process of PLUP, and objectives of the meeting, to the participants.
Session 2 Interpretation of the map	Ask and encourage the participants to delineate rivers/streams, roads, residential areas, and other key land marks with the boundaries of the village on a photo-like map covering the village.
Session 3 Demarcation of land use	Encourage the participants to demarcate boundaries of the current land use, such as dense natural forests, poor natural forests, plantations, upland farms, rice fields, bushes/grasslands, and bare lands.
Session 4 Confirmation of other uses	Help the participants further add the following information on the map. - Areas used for sifting cultivation or animal grazing - Areas where fuel wood or NTFPs are collected - Areas where forest fires have frequently occurred

Source: JICA Preparatory Survey Team (2016)

The following table shows the draft agenda of the workshop held in a village.

Workshop on Present Land Use Mapping at Village

Topic	Timeline
1. Opening Remark	08:00-08:10
2. Introduction of the project, project activities, objectives of participatory land use planning, and aims of the meeting (including questions and answers)	08:10-09:00
3. Presentation of a photo-like map and delineation of major land marks with the boundaries of the village (including coffee break)	09:00-11:00
4. Demarcation of present land uses (including lunch break)	11:00-14:30
5. Confirmation of other land uses, such as areas used for shifting cultivation, animal grazing, firewood and other NTFPs collection and those prone to forest fire.	14:30-15:30
8. Wrap-up and introduction of the next steps	15:30-15:45

Source: JICA Preparatory Survey Team (2016)

e. Determination of the project areas with development of a future land use map

Another one-day meeting shall be organized and held at the same villages with the same participants and the forest management board (FMB) responsible for protection forests/special use forests to determine the areas which can be used for forest development and improvement activities and to develop a future land use map of the village based on the present land use map prepared. The participants shall have the following discussions

Sessions/Discussions in the Meeting

Session	Description
Session 1 Identification of the project areas	Help the participants and officers of FMB identify the potential areas, such as bare lands, grasslands, and shrubs, for afforestation, and further examine if such areas can be used as project areas for afforestation by checking if no conflict over land use is foreseen and if such areas are suitable for afforestation. It is important to select a certain size of consolidated bare lands/grasslands/shrubs as potential areas, so as to reduce the operation and management costs of the forest development activities in the project. Also help them identify the potential sites for assisted natural regeneration (ANR) and protection of natural forests and assess if poor or sparse forests and natural forests can be used for the same purposes, respectively.
Session 2 Identification of land users	Assist the participants in identifying households who have land use rights over the areas selected above or who have customarily used the same areas.
Session 3 Determination of future use	Further assist the participants in the determination of the future use of other areas in the village by examining: i) whether natural forests but outside protection forests/special use forests could be protected as they area, ii) whether shifting cultivation and upland crop farms could be improved and converted into sustainable forms of use, iii) how sparse forests and shrubs could be improved, and vi) whether rice field could be maintained as rice fields in the future.

Source: JICA Preparatory Survey Team (2016)

The draft agenda of the meeting in a village is shown below.

Workshop on Determination of the Project Areas at Village

Topic	Timeline
1. Opening Remark	08:00-08:10
2. Presentation of the present land use map prepared in the previous step	08:10-08:30
3. Identification and selection of areas used for forest development activities, namely afforestation, assisted natural regeneration, and protection of natural forests (including coffee break)	08:30-11:30
4. Lunch Break	11:30-13:30
5. Development of a future land use plan based on the present land use map	13:30-15:00
6. Identification and selection of households who are willing to participate in the project	15:00-17:00
8. Wrap-up and introduction of the next steps	17:00-17:15

Source: JICA Preparatory Survey Team (2016)

f. Organization of a village working group and field verification

A one-day meeting will be further organized and held at the villages with the participation of village leaders and households identified as stakeholders of the project areas selected for forest development to confirm their willingness and to organize them into a village working group. The following sessions will be carried out in the workshop.

Sessions/Discussions in the Meeting

Session	Description
Session 1 Confirmation of the project areas	Confirm with the participants whether or not the project areas could be used for forest development activities of the project showing the future land use map.
Session 2 Formation of a group	Help the participants develop a list of households who have vested land use rights over the project areas and are willing to use the same for project.
Session 3 Discussions on rules of groups	Introduce and explain the necessity of formation of a village group to the participants, and then, help the participants discuss and determine: - Key persons (leaders, vice leaders, etc.) of the group; - Roles and responsibility of key persons and other members of the group; - Objectives, missions, and vision of the group; and - Agreement on the forest development and improvement activities in the project areas.

Session	Description
Session 4 Walk-through in the project areas	Divide the participants into several groups and visit the proposed areas with the participants. Confirm the condition of the project areas on the ground and walk through the boundaries with GPS to roughly measure the boundaries of the areas.

Source: JICA Preparatory Survey Team (2016)

A draft agenda of the meeting in a village is shown below.

Workshop on Organization of a Village Working Group and Field Verification at Village

Topic	Timeline
1. Opening Remark	08:00-08:10
2. Presentation of the future land use map and areas selected for forest development	08:10-08:30
3. Development of a list of households who will participate in the project and an agreement on the use of the selected areas	08:30-10:00
4. Coffee Break	10:00-10:15
5. Discussion on rules of a village working group	10:15-11:45
6. Lunch Break	11:45-13:30
7. Confirmation of the selected areas including the boundaries of the areas for forest development with local communities	13:30-17:00
8. Wrap-up and introduction of the next steps	17:00-17:15

Source: JICA Preparatory Survey Team (2016)

(3) Data Analysis and Processing

Present land use maps and future land use maps of the villages shall be prepared and developed on the basis of photo-like maps on a scale of 1/5,000~1/10,000 by using a GIS software.

B.1.5 Expected Outputs and Deliverables

- Present land use maps (on a scale of 1/5,000~1/10,000) of the villages of the commune concerned
- Future land use map (on a scale of 1/5,000~1/10,000) of the villages of the commune concerned
- Rules on forest management and land use in the communes concerned
- Lists of households of the village working groups with rules of the groups
- Draft agreements with village working groups on the forest development and improvement activities in the project areas

B.1.6 Timeline

(1) Overall Time Frame

The work need to be carried out in all the communes concerned with the project areas for two (2) years in the beginning of the project, likely from the 2nd to 3rd year or the 3rd to 4th year of the project. The target communes will be divided into two (2) batches so that the work will be carried out in a phased manner. Hence, each batch may cover 40~60 communes, although the number of communes may vary with the provinces as shown below.

Average Number of Communes per Batch in the Provinces

Province	Total communes concerned	Average number of commune per batch
Dien Bien	8 communes	3~5 communes/year
Lai Chau	40 communes	16~24 communes/year
Son La	15 communes	6~9 communes/year
Hoa Binh	35 communes	15~20 communes/year

Source: JICA Preparatory Survey Team (2016)

(2) Estimated Time Frame for One Commune

It is estimated that each target commune may have more or less 10 villages in it. Assuming that 10 villages geographically relate to protection forests/special use forests in a commune, it might take for about two (2) months to complete one cycle of the work in one (1) commune, which consists of 30 workshops at the village level and one consultation meeting at the commune level.

B.1.7 Pre-conditions

A set of hard copies and soft data of photo-like maps covering all the target communes will be provided to the contractor prior to the commencement of the works. The contractor, on the other hand, shall arrange competent facilitators, expertise (such as GIS operators), and other necessary assisting officers to fulfill its tasks to complete the works within a given period of time. Necessary arrangements and coordination with relevant government organizations shall also be made by the contractor prior to the actual activities in the field for smooth operations of the work.

B.2 Draft Terms of Reference (TOR) of Socio-economic Baseline Survey

B.2.1 Background

The Sustainable Forest Development Project in the Northwest Sub-region is a project newly proposed by MARD with an aim to i) restore and improve watershed forests for both environment and economic purposes, ii) strengthen the capacity of local governments as well as forest owners of watershed forests for sustainable forest management, and iii) contribute to the reduction of GHG emission through reduction of deforestation and forest degradation. The project will be implemented mainly in protection forests and special use forests selected in four provinces in the Northwest sub-region, namely, Dien Bien, Lai Chau, Son La, and Hoa Binh.

The main components of the project will be: i) survey and detailed planning, ii) improvement of watershed forests, iii) improvement of silviculture infrastructure, iv) improvement of small-scale rural infrastructure, v) support for livelihood improvement, vi) forest firecontrol, and vii)project management, and viii) consulting service.

The socio-economic baseline survey is one of the activities planned in the Survey and Detailed Planning with an aim to collect socio-economic baseline data and information of the households living in the communes/villages geographically relating to the project areas.

B.2.2 Objectives of the Work

The main objectives of the socio-economic baseline survey are i) to develop baselines of socio-economic indicators of households living in the communes relating to the project areas and ii) clarify the gender differences in forest management and protection in the commune, so as to measure the impacts that the project have made on household economy and enable the project to pay due attention to gender issues in the course of its implementation.

Specifically, the baseline survey aims to:

- Collect socio-economic data and information of the communes and local households;
- Identify main direct drivers of deforestation and forest degradation and causes of the main drivers (indirect drivers);
- Identify the extent of involvement of local households in activities/drivers of deforestation and forest degradation;
- Identify development needs of communes and local households; and

- Identify gender differences in forest management and protection in the communes.

B.2.3 Scope of the Work

(1) Major Activities

Major activities to be carried out in the baseline survey are listed below:

- Interviews to commune leaders to collect general socio-economic data and information of the communes and development needs;
- Interviews to sample households selected in the communes to collect socio-economic data of households, such as family status, living conditions/basic human needs, household economy and major sources of income, dependency on forests, and understanding of the project; and
- Interviews to women in the communes/villages to collect data on women's involvement in forest resource use, access to forest and land resources, and expected roles in forest management.

(2) Target Areas

The socio-economic baseline survey will be carried out in the following 64 communes geographically relating to the 10 protection forests and special use forests in the target provinces. The interviews to commune leaders will be carried out at the commune level, while the interviews to sample households and those to women will be carried out at the village level.

Target Communes for Socio-economic Baseline Survey

Province	Proposed Areas	District	Communes
Dien Bien	Dien Bien PF	Dien Bien	Na Tong, Phu Luong, Muon Nha
	Muong Cha PF	Muong Cha	Muong Tung
	Tuan Giao PF	Tuan Giao	Phinh Sang, Ta Ma
	Muong Phang SUF	Dien Bien	Muong Phang, Pa Khoang
Sub-total	**3PFs and 1SUF**	**3 districts**	**8 communes**
Lai Chau	Nam Na PF	Sin Ho	Hong Thu, Nam Cuoi, Nam Han, Nam Tam, Pa Khoa, Phang So Lin, Pu Sam Cap
	Nam Ma PF		Chan Nua, Lang Mo, Pa Tan, Sa De Phin, Ta Ngao, Tua Sin Chai
	Tan Uyen PF	Tan Uyen	Ho Mit, Muong Khoa, Nam Can, Nam So, Ta Mit, TT.Tan Uyen,
	Than Uyen PF	Than Uyen	Muong Mit, Pha Mu, Ta Mung
Sub-total	**4PFs**	**3 districts**	**22 communes**
Son La	Copia SUF	Thuan Chau	Chieng Bom, Co Ma, Long He
	Thuan Chau PF		Nam Lau, Muong Bam, Bam Lam
	Quynh Nhai PF	Quynh Nhai	Muong Giang, Muong Sai
	Xuan Nha SUF	Van Ho	Chieng Xuan, Tan Xuan, Chieng Son
Sub-total	**2PFs and 2SUFs**	**3 districts**	**11 communes**
Hoa Binh	Da River PF <1	Da Bac	Dong Nghe, Dong Chum, Don Ruong, Murong Chien, Murong Tuong, Suoi Nanh, Tien Phong, Vay Nura
		Tan Lac	Trung Hoa, Ngoi Hoa
		Mai Chau	Ba Khan, Tan Dan, Tan Mai
		Cao Phong	Thung Nai
	Ngoc Son–Ngo Luong SUF	Lac Son	Ngoc Lau, Ngoc Son, Tu Do
		Tan Lac	Ngo Luong, Nom Son, Bac San
	Hang Kia– Pa Co SUF	Mai Chau	Hang Kia
	Phu Canh SUF <1	Da Bac	Dong Chum, Tan Pheo, Dong Ruong, Doan Ket
Sub-total	**1PF and 3SUFs**	**5 districts**	**23 communes**
Total	**10PFs and 6SUFs**	**11 districts**	**64 communes**

Note: <1 Two (2) communes in Da River Watershed Protection Forest are also those relating to Phu Canh Nature Reserve.
Source: JICA Preparatory Survey Team (2016)

The following table shows the estimated volume of the work to be done in the baseline survey.

Estimated Volume of the Work

Work Items	Volume/Scope of the Works
Interviews to commune leaders	All the communes relating to the project areas (98 communes)
Interviews to sampled households	24 households (12 households who will participate in the project and another 12 households who will not participate in the project) selected among households in all the communes
Interviews to women	6 women selected in all the communes

Source: JICA Preparatory Survey Team (2016)

B.2.4 Methodologies of the Work

(1) Overall Process of the Work

The following activities will be carried in each commune.

- Consultation with and interviews to commune and village leaders
- Interviews to selected households for the household baseline survey
- Interviews to selected women for the gender sensitive analysis

(2) Procedures for the Survey

The procedures for the survey are outlined below.

a. Consultation with and Interview to Commune and Village Leaders

A one-day meeting will be organized and held at the center of the commune with commune and village leaders to collect general socio-economic information of the commune and select sampled interviewees (households and women) in the commune. Socio-economic data to be collected from the interview to commune and village leaders shall include, but not limited to, the following:

- Demographic conditions (villages, population, households, and ethnicity)
- Agricultural production (cropped areas, major crops, production, and number of livestock animas)
- Forestry production (area of production forests, major forestry products (including non-timber forest products), and sources of non-timber forest products)
- Fishery production and other sources of livelihoods
- Access to rural finance or existence of village funds
- Existing rural and social infrastructure (roads, irrigation systems, electricity, water supply systems, marketing, school, and health clinic, etc.)
- Existing mass organizations
- Existing activities and organizations for forest management
- Development needs of the commune

In the meeting, the participants will be asked and encouraged to select 24 households for the household baseline survey according to the following guidelines:

- Select 12 households from households who will participate in the project
- Select another 12 households from those who will not take part in.
- Select four (4) households each from the different socio economic categories, namely rich/well-being, medium, and poor/marginalized to select 12 households.

Moreover, the participants will select six (6) women considering socio-economic differences. Hence, two (2) women each will be selected from the different socio economic strata.

b. Interviews to Selected Households for the Baseline Interview Survey

A set of questionnaires, which cover the following topics, shall be developed and prepared prior to the interview survey in the field.

Topics to be covered by the Interview Survey

Topics	Survey Items
General background	Size of family, Ethnicity, History of family, Information of family members (age, educational background, occupation, etc.)
Assets and facilities, and access to social services	Major assets owned by household, Type and size of house, Access to water supply system, electricity, healthcare services, etc.
Income and expenditures	Annual (or monthly) income level, Main sources of income, Annual (or monthly) expenditure
Land tenure	Land holding size, Land tenure
Agricultural production	Cropped areas, Farming types (shifting cultivation/permanent farms), Major staple and cash crops, Production, Yields, Selling prices, Farm inputs, etc.
Forest use and management	Forest areas owned by household, Major forestry products (including NTFPs), Selling prices, Forest management activities, Collection of fire wood
Livestock and fisheries	Number of livestock animals owned, Selling prices, Any fishery activities and production, etc.
Any concerns about the project activities	Any foreseeable conflicts which might be caused by the project with their socio-economic/livelihood activities, Any suggestions to the project, etc.

Source: JICA Preparatory Survey Team (2016)

The household baseline survey will be carried out by interviewing the selected 24 households with the pre-set questionnaires.

c. Interviews to Selected Women for Gender Sensitive Analysis

Likewise, a set of questionnaires for interviews to women shall be developed and prepared prior to the field survey. The survey points in the questionnaires shall include, but not limited to, the following.

- Main roles played by women in forest use and management
- Gender differences in access to and control over forest resources
- Gender differences in decision making processes relating to forest management
- Prioritized points given by women to forests and forest management
- Possible benefits that women might be able to obtain from forest management and protection
- Possible impacts caused by the project to women

The interview survey will be carried out by interviewing the selected six (6) women with the pre-set questionnaires.

d. Data Analysis and Processing

All the data and information collected in the course of the surveys described above shall be encoded and compiled in Excel datasheets as shown below.

Data Analyses and Processing of Data

Data collected	Forms of Compilation
Commune level data:	Commune profile sheets
Data collected from the household baseline survey:	Datasheets showing the baseline indicators of participating and non-participating households in the communes
Data collected from the interviews to women	Datasheets showing significant differences in forest management, use of and access to forest resources, roles in forest protection and management, benefits/impacts from forest protection as well as the project

Source: JICA Preparatory Survey Team (2016)

B.2.5 Expected Outputs and Deliverables

- Databases of socio economic baseline data of the communes relating to the project areas
- Survey report
- Electric data of the all the outputs listed above

B.2.6 Timeline

The baseline survey shall be carried out within 10 months after signing of the contract for the work.

B.3 Other Activities

B.3.1 Site Demarcation and Set-ups of Land Marks

PFMBs/SUFMBs together with members of the village working groups will conduct perimeter surveys at the selected project areas by using GPS. During the perimeter surveys, they will also set wooden poles on the boundaries of the project areas for afforestation and put marks on standing trees or rocks along the boundaries of those for ANR and protection of natural forests at regular intervals. The locations of the landmarks (either wooden poles/marks on trees or rocks) will also be recorded by GPS so that data can be converted into GIS data and reflected to the base map of the GIS-based monitoring system.

The draft specification of the perimeter survey with set-ups of land marks is outlined below.

Specification of the Perimeter Survey with Set-ups of Land Marks

Activities	Target	Method
Perimeter survey	Contiguous project areas in the respective villages/communes within the target protection/special use forests	To walk through the boundaries of the project areas with GPS
Set-ups of land marks	Same as above.	Area for afforestation Pile wooden stakes at 50 meter intervals on the boundaries of the project areas in parallel with the perimeter surveys Area for ANR and protection of natural forests Make marks on standing trees or big rocks along the boundaries of the project areas in parallel with the perimeter surveys

Source: JICA Preparatory Survey Team (2016)

B.3.2 Detailed Designing of Forest Development and Improvement Activities including Improvement of Silviculture Infrastructure

After determination of the project areas through PLUP, PPMBs will package detailed design works for all the forest development and improvement activities and improvement of silviculture infrastructure per management board. The following tables show the current targets of the forest development and improvement activities in the target provinces.

Targets of Forest Development and Improvement

Province	Protection	ANR	Afforestation
Dien Bien	10,400	2,310	3,160
Lai Chau	0	7,500	6,550
Son La	9,900	2,470	3,220
Hoa Binh	24,880	840	3,080
Total	45,180	13,120	16,010

Source: JICA Preparatory Survey Team (2016)

Targets of Improvement of Silviculture Infrastructure

Province	Motorbike / Forestry road	Foot paths	Fire breakline	Fire watch tower	Guard station	FMB office	Information board	Nursery
Dien Bien	48 km	0 km	16 km	4 units	14 units	0 unit	10 units	1 unit
Lai Chau	48 km	0 km	114 km	11 units	8 units	0 unit	14 units	4 units
Son La	13.5 km	30 m	48 km	10 units	5 units	1 unit	17 units	3 units
Hoa Binh	12 km	0 km	56 km	4 units	6 units	0 unit	18 nits	2 units
Total	121.5 km	30 km	278 km	29 units	33 units	1 unit	59 units	10 units

Source: JICA Preparatory Survey Team (2016)

All the designing works will be contracted out to contractors that have experiences in designing of forest development and improvement activities in the respective provinces.

The contents of the detailed design should include, but not be limited to, the following.

Forest Development and Improvement Activities

- Location map based on the latest NFI&S Maps
- General information (location, area, slope, elevation, soil type, and other natural conditions) of the project areas
- Lists of compartments/divisions with associated information (e.g., compartment/division ID, areas, location, present land use/forest status, proposed design) per sub-contract package which will be further contracted out to village working groups
- Design of plantation to be developed by afforestation
- Lists of silvicultuel activities to be carried out in afforestation, ANR, and protection of natural forest
- Unit costs for each forest development/improvement sub-component
- Costs for the respective contract packages to village working groups and total cost for all the activities in the management board

Sivicultuel Structures Development and Improvement Activities

- Location map
- Results of necessary ground surveys
- Specification of each silvicultuel structure
- Designs of silvicultuel structures (plan view drawing, Cross section drawing, longitudinal profile, and structure drawing, etc.)
- Material and work quantity calculation for each silvicutuel structure
- Unit cost estimation for each silvicutuel structure

The detailed design works will be divided into three batches in accordance with the schedule of the forest development and improvement activities. The first batch of the design work will be conducted in third year (2019/2020) of the project, while the last batch of the work is scheduled to be done in fifth year (2021/2022) of the project.

B.3.3 Detailed Designing of Improvement of Small Scale Rural Infrastructure

Likewise, PPMBs will outsource detailed design works for improvement of small scale rural infrastructure, namely community road, irrigation systems, and water supply systems, to contractors based in the respective provinces. Technical design centers, consulting service centers of DARDs, and private consulting firms are likely the potential contractors for the works. The preparatory survey team tentatively short-listed the proposed rural infrasturcture development in the target provinces as follows.

Physical Targets of Improvement of Small Scale Rural Infrastructure

Province	Rural road	Irrigation system (canal)	Water supply system
Dien Bien	7.5 km	4.8 km	0 unit
Lai Chau	15.6 km	11.8 km	6 units
Son La	8.4 km	5.6 km	5 units
Hoa Binh	29.9 km	6.1 km	3 units
Total	61.4 km	28.3 km	14 units

Source: JICA Preparatory Survey Team (2016)

The contents of the detailed design should include, but not be limited to, the following.

- Location map
- Results of necessary ground surveys
- Specification of each small-scale infrastructure
- Designs of small-scale structures (plan view drawing, line distribution drawing, Cross section drawing, longitudinal profile, and structure drawing, etc.)
- Material and work quantity calculation for each small-scale structure
- Unit cost estimation for each small-scale structure

The main features of the short-listed infrastructure improvement options are summarized below.

Main Features of the Short-listed Infrastructure Development Options

Type of options	Typical Component of the Work
1) Road works	(1) Stripping of top soils by motor grader and removal of soils in the defective portion (2) Replacement of road bed material by macadam and then compaction of the surface (3) Formation of the existing road and placement of the concrete pavement with 3.0 m width and 0.16m thickness on the surface of the existing road (4) Construction of necessary side drains to drain rain water and/or inundated water when a flood takes place (5) Construction of new culverts and installation of retaining walls on the proper location if necessary
2) irrigation	(1) Replace the stone and soil check dam to concrete check dam on the mountain stream with a scouring sluice and wooden stop log (2) Installation of concrete steep slope straight canals with three supports to lead the water to gentle slope area (3) Installation of retention pool to reserve water tentatively before distribute it to the main canal (4) Construction of rectangular open concrete lining canals for irrigation (5) Construction of necessary related canal structures such as drop, culvert and turnout on the irrigation canal (6) Drainage arrangement, if necessary
3) Water supply works	(1) Replace existing concrete intake to new one (type 1) or installation of the pumping system on the reservoir (type 2) (2) Replace damaged or simple treatment tank to improved tank (3) Replace damaged PVC pipes (main pipes, sub-pipes and distribution pipes) to new ones (4) Replace damaged connectors between pipe to pipe

Source: JICA Preparatory Survey Team (2016)

B.4 Cost Estimates

The following table shows the methodologies and estimated costs of the respective activities under the components. **Tables B-2 to B-4** show the breakdown of the cost estimates of the activities except for those of detailed design works.

Specification of the Perimeter Survey with Set-ups of Land Marks

Items	Sub-itmes	Basis of cost estimation	Unit cost without VAT	Total cost without VAT	Reference table
Participatory land use planning and formation of village working groups	Procurement of satellite images (including mapping process)	Price quotation collected from agents and potential institutes	VND 933,360 /km^2	VND4,371 million	**Table B-1**
	Village workshops	Estimation based on price quotations collected from potential institutions	VND 358.8 million / commune in Dien Bien VND 345.6 million / commune in Lai Chau VND 353.3 million / commune in Son La	VND 2,871 million in Dien Bien VND 7,602 million in Lai Chau VND 3,886 million in Son La	**Table B-2**

Items	Sub-itmes	Basis of cost estimation	Unit cost without VAT	Total cost without VAT	Reference table
			VND 345.3 million / commune in Hoa Binh	VND 7,942 million in Hoa Binh	
Site demarcation and set-ups of land marks	Calculation according to the existing norms	Calculation in accordance with existing norms	VND 220,153 /ha	VND 3,525 million	**Table B-3**
Socio-economic baseline survey	Collection of price quotation from a third party	Estimation based on price quotations collected from potential institutions	VND 1,629,000 /commune	VND 1,040 million	**Table B-4**
Detailed designing works	Forest developent and improvement activities	Calculation by multiplying 2 % with the total cost of forest development and improvement activities	VND 0.7~1.1 million/ha for Afforestation VND 0.5 million/ha for ANR VND 23,000~44,000/ha for Protection	VND 4,061 million in Dien Bien VND 8,092 million in Lai Chau VND 3,071 million in Son La VND 3,788 million in Hoa Binh	Refer to Annex C
	Improvement of silviculture	Calculation by multiplying 3.5 % with the total cost of the construction cost for silviculture infrastructure	VND 22.1 million/km for motorbike/foretry road VND 0.4 million/km for footpath VND 1.5 million/km for firebreak line VND 5.2 million/unit for fire watchtower VND 22.8 million/unit for FMB office VND 11.4 million/unit for Forest guard station VND 0.7 million/unit for Information board	VND 1,410 million in Dien Bien VND 1,476 million in Lai Chau VND 575 million in Son La VND 476 million in Hoa Binh	Refer to Annex D
	Small scale rural infrastructure	Calculation based on the existing cost norms given by MoC Circular (No. 957/QD-BXD on Sep. 29, 2009), which are: Road: 6.3%; Irrigation: 9.1%; and Water supply: 6.3%.	VND 109.0 million/km for Rural road (ave.) VND 102.6 million/km for Irrigation (ave.) VND 40.6 million/unit for Water supply system (ave.)	VND 1,318 million in Dien Bien VND 3,429 million in Lai Chau VND 1,915 million in Son La VND 3,653 million in Hoa Binh	Refer to Annex E

Source: JICA Preparatory Survey Team (2016)

Tables

Table B-1 Cost Estimate of Procurement of Satellite Images and Mapping

No.	Items	Unit	Q'ty	Technical norm				Man month	Unit cost (1,000 VND)	Total amount (1,000 VND)	Remarks
				Reference Doccument	line	(K ratio)	Định mức				
1	**Procurement of satellite images**	km2	4,681	Quotation from agents					846	3,961,653	-
2	**Preparation**									**186,300**	-
2.1	**Collecting and editing maps including topographic, forest functional planning maps in 4 provinces**	commune	64	Decision No. 690/QĐ-BNN-TCCB dated April 1, 2013	line 2	0.5	4	**5.8**	27,000	156,600	Circular 219/2009/TT-BTC
2.2	**Satellite image processing and correcting based on VN2000 maps**	photo	8.0	Decision No. 690	line 3	0.5	6	**1.1**	27,000	29,700	Circular 219/2009/TT-BTC
3	**Mapping**									**121,800**	-
	Print maps (second times) at commune level	commune	64	Decision No. 690	line 25		2	**5.8**	21,000	121,800	Circular 219/2009/TT-BTC
4	**Report**	**Report**	**1**						**52,810**	**52,810**	-
5	**Management cost (8%)**	**1,000 VND**					**8%**			**28,873**	-
6	**Equipment (5%)**	**1,000 VND**					**5%**			**19,489**	-
	Total budget(1-7)	**1,000VND**								**4,370,925**	-

Table B-2 Estimated Cost of PLUP and Formation of Village Working Groups

(1) Dien Bien:

No. of Communes 8 communes

#	Item	Unit	Amount	Unit cost (1000 VND)	Total amount (1000 VND)	Note/reference
1	**Preparation (design survey, contact province, logistic…)**				**11,300**	
+	Team leader (1 person)	Man month	0.2	31,500	6,300	Level 4, Issue 8, Circular 219/2009/TT-BTC
+	Team member (2 persons)	Man month	0.2	25,000	5,000	Level 3, Issue 8, Circular 219/2009/TT-BTC
2	**Field activities**				**2,393,600**	
2.1	***Salary***				***1,304,000***	
+	Team leader (1 persons)	Man month	16	31,500	504,000	Level 4, Issue 8, Circular 219/2009/TT-BTC
+	Core team leader (1 person)	Man month	0	31,500	-	Level 4, Issue 8, Circular 219/2009/TT-BTC
+	Team member (2 persons)	Man month	32	25,000	800,000	Level 3, Issue 8, Circular 219/2009/TT-BTC
2.2	***Perdiem***				***422,400***	
-	Accomodation	Man day	1056	250	264,000	Circular No. 97/2010/TT-BTC
-	Daily allowance	Man day	1056	150	158,400	Circular No. 192/2011/TT-BTC
2.3	***Travelling cost (two 4WD car)***	***Day***	***352***	***1,800***	***633,600***	
2.4	***Payment for workshop***	***Workshop***	***8***	***4,200***	***33,600***	
3	**Satalite image analysis**				**90,000**	
3.1	***Data input (2 persons)***	***Man month***	***4***	***10,000***	***40,000***	Level 2, Issue 8, Circular 219/2009/TT-BTC
3.2	***Image analysis***				***50,000***	
+	Team member (1 persons)	Man month	2	25,000	50,000	Level 3 Issue 8, Circular 219/2009/TT-BTC
4	**Data analysis and report writing**				**101,000**	
4.1	***Data input (2 persons)***	***Man month***	***2***	***10,000***	***20,000***	Level 2, Issue 8, Circular 219/2009/TT-BTC
4.2	***Data analysis***				***81,000***	
+	Team leader	Man month	1	31,000	31,000	Level 4, Issue 8, Circular 219/2009/TT-BTC
+	Team member (2 persons)	Man month	2	25,000	50,000	Level 3, Issue 8, Circular 219/2009/TT-BTC
5	***Report writing (1 month x 2 experts)***	***Man month***	***2***	***31,000***	***62,000***	Level 4, Issue 8, Circular 219/2009/TT-BTC
6	**Sub total (1+2+3+4+5+6)**	**1,000 VND**			**2,657,900**	
7	**Management cost (8%)**	**1,000 VND**			**212,632**	
8	**Sub total (7+8)**	**1,000 VND**			**2,870,532**	
9	**VAT (10%)**	**1,000 VND**			**287,053**	
	Grand total (9+10)	**1,000 VND**			**3,157,585**	

(2) Lai Chau

No. of Communes 22 communes

#	Item	Unit	Amount	Unit cost (1000 VND)	Total amount (1000 VND)	Note/reference
1	**Preparation (design survey, contact province, logistic…)**				**11,300**	
+	Team leader (1 person)	Man month	0.2	31,500	6,300	Level 4, Issue 8, Circular 219/2009/TT-BTC
+	Team member (2 persons)	Man month	0.2	25,000	5,000	Level 3, Issue 8, Circular 219/2009/TT-BTC
2	**Field activities**				**6,582,400**	
2.1	***Salary***				***3,586,000***	
+	Team leader (1 persons)	Man month	16	31,500	504,000	Level 4, Issue 8, Circular 219/2009/TT-BTC
+	Core team leader (2 persons)	Man month	28	31,500	882,000	Level 4, Issue 8, Circular 219/2009/TT-BTC
+	Team member (6 persons)	Man month	88	25,000	2,200,000	Level 3, Issue 8, Circular 219/2009/TT-BTC
2.2	***Perdiem***				***1,161,600***	
-	Accomodation	Man day	2904	250	726,000	Circular No. 97/2010/TT-BTC
-	Daily allowance	Man day	2904	150	435,600	Circular No. 192/2011/TT-BTC
2.3	***Travelling cost (two 4WD car)***	***Day***	***968***	***1,800***	***1,742,400***	
2.4	***Payment for workshop***	***Workshop***	***22***	***4,200***	***92,400***	
3	**Satalite image analysis**				**247,500**	
3.1	***Data input (2 persons)***	***Man month***	***11***	***10,000***	***110,000***	Level 2, Issue 8, Circular 219/2009/TT-BTC
3.2	***Image analysis***				***137,500***	
+	Team member (1 persons)	Man month	5.5	25,000	137,500	Level 3 Issue 8, Circular 219/2009/TT-BTC
4	**Data analysis and report writing**				**136,000**	
4.1	***Data input (2 persons)***	***Man month***	***5.5***	***10,000***	***55,000***	Level 2, Issue 8, Circular 219/2009/TT-BTC
4.2	***Data analysis***				***81,000***	
+	Team leader	Man month	1	31,000	31,000	Level 4, Issue 8, Circular 219/2009/TT-BTC
+	Team member (2 persons)	Man month	2	25,000	50,000	Level 3, Issue 8, Circular 219/2009/TT-BTC
5	***Report writing (1 month x 2 experts)***	***Man month***	***2***	***31,000***	***62,000***	Level 4, Issue 8, Circular 219/2009/TT-BTC
6	**Sub total (1+2+3+4+5+6)**	**1,000 VND**			**7,039,200**	
7	**Management cost (8%)**	**1,000 VND**			**563,136**	
8	**Sub total (7+8)**	**1,000 VND**			**7,602,336**	
9	**VAT (10%)**	**1,000 VND**			**760,234**	
	Grand total (9+10)	**1,000 VND**			**8,362,570**	

Table B-2 Estimated Cost of PLUP and Formation of Village Working Groups

(3) Son La

No. of Communes 11 communes

#	Item	Unit	Amount	Unit cost (1000 VND)	Total amount (1000 VND)	Note/reference
1	**Preparation (design survey, contact province, logistic…)**				**11,300**	
+	Team leader (1 person)	Man month	0.2	31,500	6,300	Level 4, Issue 8, Circular 219/2009/TT-BTC
+	Team member (2 persons)	Man month	0.2	25,000	5,000	Level 3, Issue 8, Circular 219/2009/TT-BTC
2	**Field activities**				**3,291,200**	
2.1	***Salary***				***1,793,000***	
+	Facilitator (1 persons)	Man month	16	31,500	504,000	Level 4, Issue 8, Circular 219/2009/TT-BTC
+	Core team leader (1 person)	Man month	6	31,500	189,000	Level 4, Issue 8, Circular 219/2009/TT-BTC
+	Team member (3 persons)	Man month	44	25,000	1,100,000	Level 3, Issue 8, Circular 219/2009/TT-BTC
2.2	***Perdiem***				***580,800***	
-	Accomodation	Man day	1452	250	363,000	Circular No. 97/2010/TT-BTC
-	Daily allowance	Man day	1452	150	217,800	Circular No. 192/2011/TT-BTC
2.3	***Travelling cost (two 4WD car)***	***Day***	***484***	***1,800***	***871,200***	
2.4	***Payment for workshop***	***Workshop***	***11***	***4,200***	***46,200***	
3	**Satalite image analysis**				**125,000**	
3.1	***Data input (2 persons)***	***Man month***	***5.5***	***10,000***	***55,000***	Level 2, Issue 8, Circular 219/2009/TT-BTC
3.2	***Image analysis***				***70,000***	
+	Team member (1 persons)	Man month	2.8	25,000	70,000	Level 3 Issue 8, Circular 219/2009/TT-BTC
4	**Data analysis and report writing**				**109,000**	
4.1	***Data input (2 persons)***	***Man month***	***2.8***	***10,000***	***28,000***	Level 2, Issue 8, Circular 219/2009/TT-BTC
4.2	***Data analysis***				***81,000***	
+	Team leader	Man month	1	31,000	31,000	Level 4, Issue 8, Circular 219/2009/TT-BTC
+	Team member (2 persons)	Man month	2	25,000	50,000	Level 3, Issue 8, Circular 219/2009/TT-BTC
5	***Report writing (1 month x 2 experts)***	***Man month***	***2***	***31,000***	***62,000***	Level 4, Issue 8, Circular 219/2009/TT-BTC
6	**Sub total (1+2+3+4+5+6)**	**1,000 VND**			**3,598,500**	
7	**Management cost (8%)**	**1,000 VND**			**287,880**	
8	**Sub total (7+8)**	**1,000 VND**			**3,886,380**	
9	**VAT (10%)**	**1,000 VND**			**388,638**	
	Grand total (9+10)	**1,000 VND**			**4,275,018**	

(4) Hoa Binh

No. of Communes 23 communes

#	Item	Unit	Amount	Unit cost (1000 VND)	Total amount (1000 VND)	Note/reference
1	**Preparation (design survey, contact province, logistic…)**				**11,300**	
+	Team leader (1 person)	Man month	0.2	31,500	6,300	Level 4, Issue 8, Circular 219/2009/TT-BTC
+	Team member (2 persons)	Man month	0.2	25,000	5,000	Level 3, Issue 8, Circular 219/2009/TT-BTC
2	**Field activities**				**6,881,600**	
2.1	***Salary***				***3,749,000***	
+	Facilitator (1 persons)	Man month	16	31,500	504,000	Level 4, Issue 8, Circular 219/2009/TT-BTC
+	Core team leader (12 person)	Man month	30	31,500	945,000	Level 4, Issue 8, Circular 219/2009/TT-BTC
+	Team member (6 persons)	Man month	92	25,000	2,300,000	Level 3, Issue 8, Circular 219/2009/TT-BTC
2.2	***Perdiem***				***1,214,400***	
-	Accomodation	Man day	3036	250	759,000	Circular No. 97/2010/TT-BTC
-	Daily allowance	Man day	3036	150	455,400	Circular No. 192/2011/TT-BTC
2.3	***Travelling cost (two 4WD car)***	***Day***	***1012***	***1,800***	***1,821,600***	
2.4	***Payment for workshop***	***Workshop***	***23***	***4,200***	***96,600***	
3	**Satalite image analysis**				**260,000**	
3.1	***Data input (2 persons)***	***Man month***	***11.5***	***10,000***	***115,000***	Level 2, Issue 8, Circular 219/2009/TT-BTC
3.2	***Image analysis***				***145,000***	
+	Team member (1 persons)	Man month	5.8	25,000	145,000	Level 3 Issue 8, Circular 219/2009/TT-BTC
4	**Data analysis and report writing**				**139,000**	
4.1	***Data input (2 persons)***	***Man month***	***5.8***	***10,000***	***58,000***	Level 2, Issue 8, Circular 219/2009/TT-BTC
4.2	***Data analysis***				***81,000***	
+	Team leader	Man month	1	31,000	31,000	Level 4, Issue 8, Circular 219/2009/TT-BTC
+	Team member (2 persons)	Man month	2	25,000	50,000	Level 3, Issue 8, Circular 219/2009/TT-BTC
5	***Report writing (1 month x 2 experts)***	***Man month***	***2***	***31,000***	***62,000***	Level 4, Issue 8, Circular 219/2009/TT-BTC
6	**Sub total (1+2+3+4+5+6)**	**1,000 VND**			**7,353,900**	
7	**Management cost (8%)**	**1,000 VND**			**588,312**	
8	**Sub total (7+8)**	**1,000 VND**			**7,942,212**	
9	**VAT (10%)**	**1,000 VND**			**794,221**	
	Grand total (9+10)	**1,000 VND**			**8,736,433**	

Table B-3 Estimated Cost of Socio-economic Baseline Survey

#	Item	Unit	Amount	Unit cost (1000 VND)	Total amount	Note/Reference
1	**Preparation (design survey and questionnaires, contact province, logistic…)**				**17,400**	
	Team leader	Man month	0.4	31,000	12,400	Circular 219/2009/TT-BTC
	Team member (1 person)	Man month	0.2	25,000	5,000	Circular 219/2009/TT-BTC
2	**Field trip (data collection at province and district levels, interview stakeholders in value chains…)**				**786,800**	
2.1	***Salary***				***438,000***	
+	Team leader	Man month	3	31,000	93,000	Circular 219/2009/TT-BTC
+	Team member (3 persons)	Man month	13.8	25,000	345,000	Circular 219/2009/TT-BTC
2.2	***DSA***				***201,600***	
+	Team leader (1 person x 5 months x 30 days)				36,000	
−	Accomodation	Man day	90	250	22,500	Circular No. 97/2010/TT-BTC
−	Daily allowance	Man day	90	150	13,500	Circular No. 192/2011/TT-BTC
+	Team member (3 persons x 5 months x 30 days)				165,600	
−	Accomodation	Man day	414	250	103,500	Circular No. 97/2010/TT-BTC
−	Daily allowance	Man day	414	150	62,100	Circular No. 192/2011/TT-BTC
2.3	***Travelling cost (4WD car)***	***Day***	***4.6***	***2,000***	***9,200***	
2.4	***Honorarium for local guides***	***Man day***	***138***	***200***	***27,600***	
2.5	***Honorarium for commune and village staffs***	***person***	***64***	***70***	***4,480***	Circular No.58/2011/TT-BTC
2.6	***Honorarium for households (64 communesx24hhs)***	***person***	***1536***	***50***	***76,800***	Circular No.58/2011/TT-BTC
2.7	***Honorarium for women interviewed (64 commune x6 women/commune)***	***person***	***384***	***50***	***19,200***	Circular No.58/2011/TT-BTC
2.8	***Photocopy of questionnaires***				***9,920***	
	Questionnaire for commune staffs	copies	64	5	320	
	Questionnaire for households	copies	1536	5	7,680	
	Questionnaire for women	copies	384	5	1,920	
3	**Data analysis and report**				**159,000**	
3.1	***Data input (5 persons)***	***Man month***	***5***	***5,400***	***27,000***	Circular 219/2009/TT-BTC
3.2	***Data analysis***				***112,000***	
	Team leader	Man month	2	31,000	62,000	Circular 219/2009/TT-BTC
	Team member (2 persons)	Man month	2	25,000	50,000	Circular 219/2009/TT-BTC
3.3	***Writing report***	***Lumsum***			***20,000***	
4	**Sub total (1+2+3)**	**1.000 VND**			**963,200**	
5	**Management cost (8%)**	**1.000 VND**			**77,056**	
6	**Total budget (Without VAT)**	**1.000 VND**			**1,040,256**	
7	**VAT (10%)**	**1.000 VND**			**104,026**	
	Total budget (6+7)	**1.000 VND**			**1,144,282**	

Table B-4 Estimated Cost of Demarcation of Boundaries and Set-ups of Land Marks

Conditions used for estimation:

1. Model area (ha): 10
2. Number of wooden poles (no.) 28
3. Unit cost/MD: 231,000

	Activity	Unit	Quantity	Norm	Cost		Total (VND)
					Man-day	Unit cost (VND)	(a = b + c)
I	**Labor & transport cost**			**Total**			**1,391,388**
1.1	Labor cost						
-	Vegetation clearin on the boundary	m^2	1,400	443	3.16	231,000	730,023
-	Hole digging for ecomonic speceis (20*20*40 cm)	hole	28	59	0.47	231,000	109,627
-	Piling	pole	28	134	0.21	231,000	48,269
-	Coloring	pole	28	186	0.15	231,000	34,774
1.2	Transportation cost						
-	Transport cost of wooden pole by man	pole	28	13.80	2.03	231,000	468,696
II	**Material cost**			**Total**			**610,000**
1	Seedlings						
-	Wooden pole	pole	28			20,000	560,000
-	Color paint	pcs	1	1.00		50,000	50,000
	Total of I and II						**2,001,388**
III	**Indirect cost (Management cost)**			**Total**			**200,139**
1	Management (10% of direct cost)					10%	200,139
IV	**G.Total of I ~ III**						**2,201,527**
						Cost per ha	**220,153**

Annex C

Annex C Standard Designs and Cost Estimates for Improvement of Watershed Forests

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Annex C: Standard Designs and Cost Estimates for Improvement of Watershed Forest

C.1 Forest Development and Improvement Activities of the Component

Based on the field surveys made and consultations with relevant stakeholders in the target provinces, the following activities were selected as project activities to be carried out under the "Improvement of Watershed Forests."

- Afforestation in protection forests and special use forests
- Assisted natural regeneration in protection forests and special use forests
- Protection of natural forests in protection forests and special use forests

C.2 Designs of the Forest Development and Improvement Activities

The standard designs of the above-listed activities were examined and determined in accordance with the MARD Decision No. 38/2005/QD-BNN dated July 6, 0015 (Decision on Technical and Economic Norms of Forest Plantation, Natural Forest Assisted Regeneration and Forest Protection. which provides technical guideline for designing plantations and other forest improvement activities. The following table describe the standard design of the respective activities proposed in the target protection forests and special use forests in the target provinces.

Standard Design of afforestation for Protection Forest

Item	Design
1. Present vegetation type	Ia & Ib (grassland and bush)
2. Density of planting	1,600 trees/ha
3. Tree species planted	- Mix planting of main (Indigenous) species and subordinate (economical) species. - Suggested main (Indigenous) species are *Schima walichii, Alnus napalensis, Docynia indica, Pinus massoniana, Canarium album, Chukrasia tabularis etc.* - Suggested subordinate (economical) species are *Manglietia glauca, Acacia mangium, A. auriculiformis, A.hybrid.*etc. - Ratio of main species and subordinate species is 3:5
4. Tending & protection	Tending(spot weeding, clearing) and protection are continued for three (3) years after planting
5. Replanting	15 % of the total main seedlings and 10 % of the total subordinate species planted in the first year will be replanted in the second year.
6. Target tree density at maturity	Multi-layered main species (600 trees/ha) formulates the closed canopy layer in 20 - 25 year. (Ia or Ib → II)
7. Remarks	Subordinate species are planted with the main species to form the canopy cover in the early stage to give favorable conditions for the growth of main species. Subordinate species should be gradually harvested by thinning from 5th year.

Source: Adapted by the JICA Preparatory Survey Team (2016) based on Decision No.17/2015/ QĐ-CP and Decision No. 38/2005/QD-BNN

Standard Design of afforestation for Special Use Forest

Item	Design
1. Present vegetation type	Ia & Ib (grassland and bush)
2. Density of planting	600 trees/ha
3. Tree species planted	- Only indigenous tree species will be planted. -Suggested tree species are *Alnus nepalensis* (Tong qua su), *Chukrasia tabulris* (Lat hoa), *Schima walichii* (Voi thuoc), *Canarium album* (Tram trang), *Pinus massoniana* (Thong ma vi).
4. Tending & protection	Tending and protection is continued for three (3) years after planting
5. Replanting	10 % of the total seedlings planted in the first year will be replanted in the second year.
6. Target tree density at maturity	Indigenous species (600 trees/ha) formulates the closed canopy layer in 20- 25 year. (Ia or Ib → II)
7.Remarks	-

Source: Adapted by the JICA Preparatory Survey Team (2016) based on Decision No.17/2015/ QĐ-CP and Decision No. 38/2005/QD-BNN

Standard Design for Protection of Natural Forest

Item	Design
1. Present vegetation type	II (Recovering forest with small diameter pioneer trees), III (Impacted forest by the human activity), IV (Original forest or mature secondary forest)
2. Activities	Patrolling and reporting. Maintenance of the sign board for forest protection for five (5) years.
3. Target tree density at maturity	These forest maintained in good conditions.
4. Remarks	According to government degree (Decision No.75/QD-CP), the support of forest protection activity is 400,000VND/ha/year. In the case of receiving PFES in target area, PEFS will be deducted from amount of assistance by the project.

Source: Adapted by the JICA Preparatory Survey Team (2016) based on Decision No.17/2015/ QĐ-CP and Decision No. 38/2005/QD-BNN

Standard Design for ANR without Enrichment Planting

Item	Design
1. Present vegetation type	Ic (woodlot)
2. Tending & protection	Assistance for natural regeneration of indigenous trees for three years followed by two years protection.
3. Target tree density at maturity	Mixed multi-layered forest of indigenous tree (Ic ➞ II)
4.Remarks	After 3 years support of ANR, only forest protection activity will be continued.

Source: Adapted by the JICA Preparatory Survey Team (2016) based on Decision No.17/2015/ QĐ-CP and Decision No. 38/2005/QD-BNN

Tree species will be determined when detailed designing woks are conducted by contractors based on the site conditions.

C.3 Estimation of Unit Costs of the Activities

The unit costs of the forest development and improvement activities are estimated in accordance with the technical and economic norms described above. **Tables C-1~C-18** shows the details of the cost estimates, and the following table shows their summaries.

Unit Cost and Yearly Cost Breakdown of the Forest Development and Improvement Activities

(unit: VND million/ha)

Activities	Year					Total
	1st	2nd	3rd	4th	5th	
Afforestation in protection forest	26.76	13.17	10.03	3.90	0.00	53.87
Afforestation in nature reserves	18.33	7.85	5.52	2.12	0.00	33.83
Assisted natural regeneration	2.01	2.01	2.01	0.44	0.44	6.91
Protection of natural forest	0.23-0.44	0.23-0.44	0.23-0.44	0.23-0.44	0.23-0.44	1.15-2.20

Source: JICA Preparatory Survey Team (2016)

The unit cost of protection of natural forest varies from VND 0.23 million/ha/year to VND 0.44 million/ha/year depending on the existing payment levels of PFES.

On the other hand, the unit costs of detailed design works for the forest development and improvement activities are estimated at 2% of the physical development activities. The following table shows the estimated unit costs of the detailed design works.

Unit Cost of Detailed Design Works

(unit: VND million/ha)

Forest Development and Improvement Activities	Cost of DD
Afforestation in protection forest	1.08
Afforestation in nature reserves	0.68
Assisted natural regeneration	0.14
Protection of natural forest	0.02~0.04

Source: JICA Preparatory Survey Team (2016)

C.4 Total Estimated Cost and Annual Cost Disbursement

The work volume and schedule of the forest development and improvement activities in the target provinces are shown in **Tables C-19~C-22**, and summarized below.

Work Volume and Schedule of the Forest Development and Improvement Activities in the Provinces

(Unit: ha)

Provinces	Activities	Yr 4	Yr 5	Yr 6	Yr 7	Total
Dien Bien	Afforestation in protection forest	632	1,264	1,264	0	3,160
	Afforestation in nature reserve	0	0	0	0	0
	Assisted natural regeneration	924	1,386	0	0	2,310
	Protection of natural forest	4,160	6,240	0	0	10,400
Lai Chau	Afforestation in protection forest	1,310	2,620	2,620	0	6,550
	Assisted natural regeneration	3,000	4,500	0	0	7,500
	Protection of natural forest	0	0	0	0	0
Son La	Afforestation in protection forest	432	864	864	0	2,160
	Afforestation in nature reserve	212	424	424	0	1,060
	Assisted natural regeneration	988	1,472	0	0	2,470
	Protection of natural forest	3,960	5,940	0	0	9,900
Hoa Binh	Afforestation in protection forest	412	824	824	0	2,060
	Afforestation in nature reserve	204	408	408	0	1,020
	Assisted natural regeneration	336	504	0	0	840
	Protection of natural forest	9,952	14,928	0	0	24,880

Source: JICA Preparatory Survey Team (2016)

The project costs required for the forest development and improvement activities in the target province were calculated by multiplying the unit costs of the activities with the respective targets. The results of calculation are shown in **Tables C-19 to C-23**, and summarized below.

Total Costs and Annual Costs required for the Activities in the Target Provinces

(Unit: VND Million)

Provinces	Activities	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Total
Dien Bien	Afforestation in protection forest	16,915	42,152	56,817	31,796	17,618	4,934	170,233
	Afforestation in nature reserve	0	0	0	0	0	0	0
	Assisted natural regeneration	1,856	4,640	4,640	3,191	1,016	610	16,900
	Protection of natural forest	1,352	3,380	3,380	3,380	3,380	2,028	15,954
	Sub-total	20,123	50,173	64,837	38,367	22,015	7,572	203,087
Lai Chau	Afforestation in protection forest	35,061	87,373	117,769	65,907	65,907	10,227	352,857
	Assisted natural regeneration	6,026	15,066	15,066	10.360	10.360	1,980	51,790
	Protection of natural forest	0	0	0	0	0	0	0
	Sub-total	41,087	102,439	132,835	76,266	39,819	12,207	404,655
Son La	Afforestation in protection forest	11,562	28,813	38,837	21,734	12,043	3,373	116,362
	Afforestation in nature reserve	3,886	9,437	4,501	2,791	900	9	35,859
	Assisted natural regeneration	1,985	4,962	4,962	3,412	1,087	652	17,059
	Protection of natural forest	1,299	3,247	3,247	3,247	3,247	1,948	16,236
	Sub-total	18,526	46,459	51,547	31,184	17,277	5,321	170,520
Hoa Binh	Afforestation in protection forest	11,027	27,479	37,039	20,728	11,485	3,217	110,975
	Afforestation in nature reserve	3,739	9,081	4,331	2,686	866	866	34,505
	Assisted natural regeneration	675	1,687	1,687	1,160	370	222	5,801
	Protection of natural forest	3,085	7,713	7,713	7,713	7,713	4,628	38,564
	Sub-total	18,526	45,960	50,770	32,287	20,434	8,932	189,846

Source: JICA Preparatory Survey Team (2016)

The total costs for the detailed design works were estimated at VND 19,642 million for the entire target areas for the forest development and improvement activities. The following table shows the estimated costs required for the detailed design works in the respective provinces.

Unit Cost of Detailed Design Works

(unit: VND million)

Forest Development and Improvement Activities	Cost of DD
Dien Bien	4,061
Lai Chau	8.092
Son La	3,071
Hoa Binh	3,788
Total	19,642

Source: JICA Preparatory Survey Team (2016)

Tables

Table C-1 Summary of the Unit Cost of Each Forestry Development Sub-component

Summary of annual cost of forestry development per ha by model

Sub-component	Model	Total cost (mil VND/ha)	Annual Cost (mil VND/ha)					Reference	
			Year 1	Year 2	Year 3	Year 4	Year 5		
Watershed sites									
(1) Afforestation for Protection Forest	AFF-01	53.87	26.76	13.17	10.03	3.90		Table E-6	Main tree(600) & Sub tree(1,000)
(1) Afforestation for Natural Reserve Forest	AFF-02	33.83	18.33	7.85	5.52	2.12		Table E-7	Main tree (600)
(1) Afforestation -Average	AF-ave	43.85	22.55	10.51	7.78	3.01			
(2) Forest Protection for Dien Bien Province (Average)	FP-01	1.63	0.33	0.33	0.33	0.33	0.33	Table E-8	
(2) Forest Protection for Dien Bien PFMB	FP-02	2.20	0.44	0.44	0.44	0.44	0.44	Table E-9	
(2) Forest Protection for Tuan Giao PFMB	FP-03	1.43	0.29	0.29	0.29	0.29	0.29	Table E-10	
(2) Forest Protection for Muong Phang SUFMB	FP-04	1.20	0.24	0.24	0.24	0.24	0.24	Table E-11	
(2) Forest Protection for Son La Province (Average)	FP-05	1.64	0.33	0.33	0.33	0.33	0.33	Table E-12	
(2) Forest Protection for Copia-SUFMB	FP-06	1.65	0.33	0.33	0.33	0.33	0.33	Table E-13	
(2) Forest Protection for Thuan Chau PFMB	FP-07	2.16	0.43	0.43	0.43	0.43	0.43	Table E-14	
(2) Forest Protection for Quynh Nhai PFMB	FP-08	1.15	0.23	0.23	0.23	0.23	0.23	Table E-15	
(2) Forest Protection for Xuan Nha SUFMB	FP-09	1.15	0.23	0.23	0.23	0.23	0.23	Table E-16	
(2) Forest Protection for Hoa Binh Province (Average)	FP-10	1.55	0.31	0.31	0.31	0.31	0.31	Table E-17	
(2) Forest Protection for Ngoc Son-Ngo Luong SUFMB	FP-11	2.20	0.44	0.44	0.44	0.44	0.44	Table E-18	
(2) Forest Protection for HANG Kia - Pa Co SUFMB	FP-12	2.20	0.44	0.44	0.44	0.44	0.44	Table E-19	
(2) Forest Protection for Phu Canh SUFMB	FP-13	1.45	0.29	0.29	0.29	0.29	0.29	Table E-20	
(2) Forest Protection for Da River Watershed PFMB	FP-14	1.20	0.24	0.24	0.24	0.24	0.24	Table E-21	
(2) Forest Protection -Average	FP-ave	1.61	0.32	0.32	0.32	0.32	0.32		
(3) ANR without Enrichment planting	ANR-01	6.91	2.01	2.01	2.01	0.44	0.44	Table E-22	

Table C-2 Cost Breakdown per ha of Afforestation for Protection Forest (AFF-01)

Density (trees/ha):	1,600	Unit cost/MD:	231,000
Economic species: *Acacia spp.*	1,000	Replanting: econ. species	10%
Indigenous species (2 years old):	600	Replanting: indi. species	15%

	Activity	Unit	Quantity	Norm	Cost (VND)			Annual Cost per ha (VND million)				
					Man-day	Unit cost	Amount	Year 1	Year 2	Year 3	Year 4	Total
I	**Labor cost**						**42,508,878**	**18.63**	**11.21**	**9.12**	**3.55**	**42.51**
1	**Year 1**				**78.58**		**18,631,094**	**18.63**				
1.1	Labor cost											
-	Vegetation clearing	m^2	7,000	443	15.80	231,000	3,650,113					
-	Hole digging for ecomonic speceis (30*30*30 cm)	hole	1,000	108	9.26	231,000	2,138,889					
-	Hole digging for indigenous speceis (40*40*40 cm)	hole	600	59	10.17	231,000	2,349,153					
-	Hole backfilling for ecomonic species	hole	1,000	285	3.51	231,000	810,526					
-	Hole backfilling for indigenous species	hole	600	173	3.47	231,000	801,156					
-	Transport and planting of economic species (<0.5 kg/tree)	tree	1,000	134	7.46	231,000	1,723,881					
-	Transport and planting of indigenous species (<1.2 kg/tree)	tree	600	134	4.48	231,000	1,034,328					
-	Weeding	tree	7,000	611	11.46	231,000	2,646,481					
-	Land tilling around tree	m^2	1,600	186	8.60	231,000	1,987,097					
-	Forest Protection	ha	1	0.11	4.37	231,000	1,009,470					
1.2	Transportation cost											
-	Transport cost of seedlings by truck (long cabin or tipper)	tree	1,600			200	320,000					
-	Transport cost of seedlings by man	tree	1,600			100	160,000					
2	**Year 2**				**48.30**		**11,206,386**		**11.21**			**11.21**
2.1	Labour cost											
-	1st weeding	m^2	7,000	611	11.46	231,000	2,646,481					
-	1st land tilling around tree	tree	1,600	186	8.60	231,000	1,987,097					
-	Transport seedling and replanting	tree	190	93	2.04	231,000	471,935					
-	2nd weeding	m^2	7,000	790	8.86	231,000	2,046,835					
-	2nd land tilling around tree	tree	1,600	186	8.60	231,000	1,987,097					
-	Forest Protection	ha	1	0.11	8.74	231,000	2,018,940					
2.2	Transporting cost											
-	Transport cost of seedlings by truck (long cabin or tipper)	tree	160			200	32,000					
-	Transport by man	tree	160			100	16,000					
3	**Year 3**				**30.75**		**9,122,658**			**9.12**		**9.12**
3.1	Labour cost											
-	1st weeding	m^2	5,000	722	6.93	231,000	1,599,723					
-	1st land tilling around tree	tree	1,600	186	8.60	231,000	1,987,097					
-	2nd weeding	m^2	5,000	755	6.62	231,000	1,529,801					
-	2nd land tilling around tree	tree	1,600	186	8.60	231,000	1,987,097					
-	Forest Protection	ha	1	0.11	8.74	231,000	2,018,940					
4	**Year 4**				**6.62**		**3,548,741**				**3.55**	**3.55**
4.1	Labour cost											
-	1st weeding	m^2	5,000	755	6.62	231,000	1,529,801					
-	Forest Protection	ha	1	0.11	8.74	231,000	2,018,940					
II	**Material cost**				**Quantity**	**Unit cost**	**Amount**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Total**
							6,465,000	**5.70**	**0.77**			**6.47**
1	Seedlings											
-	Economic species (exotic, fast growing)	tree	1,100			1,800	1,980,000	1.80	0.18			1.98
-	Indigenous species	tree	690			6,500	4,485,000	3.90	0.59			4.49
III	**Indirect cost**				**Quantity**	**Unit cost**	**Amount**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Total**
							4,897,388	**2.43**	**1.20**	**0.91**	**0.35**	**4.90**
1	Management (10% of direct cost)	%		10%			4,897,388	2.43	1.20	0.91	0.35	4.90
-	Budget allocation & Document preparation											
-	Appraisal for detailed design and cost											
-	Monitoring & checking in the field											
-	Inspection (Every Year from Year 1 till Year 4)											
-	Others											
IV	**Ground Total (I+II+III)**						**53,871,266**	**26.76**	**13.17**	**10.03**	**3.90**	**53.87**

Note: It is assumed that 4.37 MD is consumed to protect 1 ha of plantation for first year but 8.74 MD is comsumed to protect 1 ha from second year.

Table C-3 Cost Breakdown per ha of Afforestation for Natural Reserve forest (AFF-02)

Density (trees/ha): 600 Unit cost/man-day: 231,000
Economic species: *Acacia spp.* Replanting: 10%
Indigenous species (2 years old seedlings): 600

	Activity	Unit	Quantity	Norm	Cost (VND)			Annual Cost per ha (VND million)				
					Man-day	Unit cost	Amount	Year 1	Year 2	Year 3	Year 4	Total
I	**Labor cost**			**Total**	**167.74**		**26,463,437**	**12.76**	**6.75**	**5.02**	**1.93**	**26.46**
1	**Year 1**				**54.47**		**12,763,117**	**12.76**				**12.76**
1.1	Labor cost											
-	Vegetation clearing	m^2	7,000	351	19.94	231,000	4,606,838					
-	Hole digging for ecomonic speceis (30*30*30 cm)	hole		108		231,000						
-	Hole digging for indigenous speceis (40*40*40 cm)	hole	600	59	10.17	231,000	2,349,153					
-	Hole backfilling for ecomonic species	hole		285		231,000						
-	Hole backfilling for indigenous species	hole	600	173	3.47	231,000	801,156					
-	Transport and planting of economic species (<0.5 kg/tr	tree		134		231,000						
-	Transport and planting of indigenous species (<1.2 kg/t	tree	600	134	4.48	231,000	1,034,328					
-	Weeding	m^2	7,000	611	11.46	231,000	2,646,481					
-	Land tilling around tree	spot	600	186	3.23	231,000	745,161					
-	Forest Protection	ha	1	0.58	1.73	231,000	400,000					
1.2	Transportation cost											
-	Transport cost of seedlings by truck (long cabin or tipp	tree	600			200	120,000					
-	Transport cost of seedlings by man	tree	600			100	60,000					
2	**Year 2**				**29.15**		**6,750,671**		**6.75**			**6.75**
2.1	Labour cost											
-	1st weeding	m^2	7,000	611	11.46	231,000	2,646,481					
-	1st land tilling around tree	tree	600	186	3.23	231,000	745,161					
-	Transport seedling and replanting	tree	60	93	0.65	231,000	149,032					
-	2nd weeding	m^2	7,000	790	8.86	231,000	2,046,835					
-	2nd land tilling around tree	tree	600	186	3.23	231,000	745,161					
-	Forest Protection	ha	1	0.58	1.73	231,000	400,000					
2.2	Transporting cost											
-	Transport cost of seedlings by truck (long cabin or tipp	tree	60			200	12,000					
-	Transport by man	tree	60			100	6,000					
3	**Year 3**				**20.00**		**5,019,847**			**5.02**		**5.02**
3.1	Labour cost											
-	1st weeding	m^2	5,000	722	6.93	231,000	1,599,723					
-	1st land tilling around tree	tree	600	186	3.23	231,000	745,161					
-	2nd weeding	m^2	5,000	755	6.62	231,000	1,529,801					
-	2nd land tilling around tree	tree	600	186	3.23	231,000	745,161					
-	Forest Protection	ha	1	0.58	1.73	231,000	400,000					
4	**Year 4**				**6.62**		**1,929,801**				**1.93**	**1.93**
4.1	Labour cost											
-	1st weeding	m^2	5,000	755	6.62	231,000	1,529,801					
-	Forest Protection	ha	1	0.58	1.73	231,000	400,000					
II	**Material cost**				**Quantity**	**Unit cost**	**Amount**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Total**
							4,290,000	**3.90**	**0.39**			**4.29**
1	Seedlings											
-	Economic species (exotic, fast growing)	tree										
-	Indigenous species	tree	660			6,500	4,290,000	3.90	0.39			4.29
III	**Indirect cost**				**Quantity**	**Unit cost**	**Amount**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Total**
							3,075,344	**1.67**	**0.71**	**0.50**	**0.19**	**3.08**
1	Management (10% of direct cost)	%		10%			3,075,344	1.67	0.71	0.50	0.19	3.08
-	Budget allocation & Document preparation											
-	Appraisal for detailed design and cost											
-	Monitoring & checking in the field											
-	Inspection (Every Year from Year 1 till Year 4)											
-	Others											
IV	**Ground Total (I+II+III)**						**33,828,780**	**18.33**	**7.85**	**5.52**	**2.12**	**33.83**

Note: The cost for protectoin is 400,000 VND/ha/yr. It is assumed that 1.73 MD is consumed to protect 1 ha of forest.

Table C-4 Cost Breakdown per ha of Protection of Natural Forest for Dien Bien Province (FP-01)

Protection: 400,000 VND/ha/year

	Activity	Unit	Quantity	Norm	Cost (VND)			Annual Cost per ha (VND million)					
					Quantity	Unit cost	Amount	Year 1	Year 2	Year 3	Year 4	Year 5	Total
I	**Labor cost**						**2,000,000**	**0.29**	**0.29**	**0.29**	**0.29**	**0.29**	**1.43**
1	**Year 1**						**400,000**	**0.29**					**0.29**
1.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(115,000)						
2	**Year 2**						**400,000**		**0.29**				**0.29**
2.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(115,000)						
3	**Year 3**						**400,000**			**0.29**			**0.29**
3.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(115,000)						
4	**Year 4**						**400,000**				**0.29**		**0.29**
4.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(115,000)						
5	**Year 5**						**400,000**					**0.29**	**0.29**
5.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(115,000)						
II	**Material cost**				**Quantity**	**Unit cost**	**Amount**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
1	Seedlings												
-	Economic species (exotic, fast growing)	tree											
	Indigenous species	tree											
III	**Indirect cost**				**Quantity**	**Unit cost**	**Amount**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
							200,000	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.20**
1	Management (10% of direct cost)	%		10%			200,000	0.04	0.04	0.04	0.04	0.04	0.20
-	Budget allocation & Document preparation												
-	Appraisal for detailed design and cost												
-	Monitoring & checking in the field												
-	Inspection (Every Year from Year 1 till Year 4)												
-	Others												
V	**Ground Total (I+II+III)**						**2,200,000**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**1.63**

Note: The cost for protectoin is 400,000 VND/ha/yr. It is assumed that 1.73 MD is consumed to protect 1 ha of forest.

Table C-5 Cost Breakdown per ha of Protection of Natural Forest for Dien Bien PFMB (FP-02)

Protection: 400,000 VND/ha/year

	Activity	Unit	Quantity	Norm	Cost (VND)			Annual Cost per ha (VND million)					
					Quantity	Unit cost	Amount	Year 1	Year 2	Year 3	Year 4	Year 5	Total
I	**Labor cost**				**0.00**	**0**	**2,000,000**	**0.40**	**0.40**	**0.40**	**0.40**	**0.40**	**2.00**
1	**Year 1**						**400,000**	**0.40**					**0.40**
1.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			0						
2	**Year 2**						**400,000**		**0.40**				**0.40**
2.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			0						
3	**Year 3**						**400,000**			**0.40**			**0.40**
3.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			0						
4	**Year 4**						**400,000**				**0.40**	**0.00**	**0.40**
4.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			0						
5	**Year 5**						**400,000**					**0.40**	**0.40**
5.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			0						
II	**Material cost**				**Quantity**	**Unit cost**	**Amount**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
							0	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
1	Seedlings												
-	Economic species (exotic, fast growing)	tree											
	Indigenous species	tree											
III	**Indirect cost**				**Quantity**	**Unit cost**	**Amount**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
							200,000	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.20**
1	Management (10% of direct cost)	%		10%			200,000	0.04	0.04	0.04	0.04	0.04	0.20
-	Budget allocation & Document preparation												
-	Appraisal for detailed design and cost												
-	Monitoring & checking in the field												
-	Inspection (Every Year from Year 1 till Year 4)												
-	Others												
V	**Ground Total (I+II+III)**						**2,200,000**	**0.44**	**0.44**	**0.44**	**0.44**	**0.44**	**2.20**

Note:The cost for protectoin is 400,000 VND/ha/yr. It is assumed that 1.73 MD is consumed to protect 1 ha of forest.

Table C-6 Cost Breakdown per ha of Protection of Natural Forest for Tuan Giao PFMB (FP-03)

Protection: 400,000 VND/ha/year

	Activity	Unit	Quantity	Norm	Cost (VND)			Annual Cost per ha (VND million)					
					Quantity	Unit cost	Amount	Year 1	Year 2	Year 3	Year 4	Year 5	Total
I	**Labor cost**						**2,000,000**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**1.23**
1	**Year 1**						**400,000**	**0.25**					**0.25**
1.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(155,000)						
2	**Year 2**						**400,000**		**0.25**				**0.25**
2.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(155,000)						
3	**Year 3**						**400,000**			**0.25**			**0.25**
3.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(155,000)						
4	**Year 4**						**400,000**				**0.25**		**0.25**
4.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(155,000)						
5	**Year 5**						**400,000**					**0.25**	**0.25**
5.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(155,000)						
II	**Material cost**				**Quantity**	**Unit cost**	**Amount**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
1	Seedlings												
-	Economic species (exotic, fast growing)	tree											
	Indigenous species	tree											
III	**Indirect cost**				**Quantity**	**Unit cost**	**Amount**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
							200,000	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.20**
1	Management (10% of direct cost)	%		10%			200,000	0.04	0.04	0.04	0.04	0.04	0.20
-	Budget allocation & Document preparation												
-	Appraisal for detailed design and cost												
-	Monitoring & checking in the field												
-	Inspection (Every Year from Year 1 till Year 4)												
-	Others												
V	**Ground Total (I+II+III)**						**2,200,000**	**0.29**	**0.29**	**0.29**	**0.29**	**0.29**	**1.43**

Note: The cost for protectoin is 400,000 VND/ha/yr. It is assumed that 1.73 MD is consumed to protect 1 ha of forest.

Table C-7 Cost Breakdown per ha of Protection of Natural Forest for Muong Phang SUFMB (FP-04)

Protection: 400,000 VND/ha/year

	Activity	Unit	Quantity	Norm	Cost (VND)			Annual Cost per ha (VND million)					
					Quantity	Unit cost	Amount	Year 1	Year 2	Year 3	Year 4	Year 5	Total
I	**Labor cost**						**2,000,000**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**1.00**
1	**Year 1**						**400,000**	**0.20**					**0.20**
1.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(200,000)						
2	**Year 2**						**400,000**		**0.20**				**0.20**
2.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(200,000)						
3	**Year 3**						**400,000**			**0.20**			**0.20**
3.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(200,000)						
4	**Year 4**						**400,000**				**0.20**		**0.20**
4.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(200,000)						
5	**Year 5**						**400,000**					**0.20**	**0.20**
5.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(200,000)						
II	**Material cost**				**Quantity**	**Unit cost**	**Amount**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
1	Seedlings												
-	Economic species (exotic, fast growing)	tree											
	Indigenous species	tree											
III	**Indirect cost**				**Quantity**	**Unit cost**	**Amount**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
							200,000	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.20**
1	Management (10% of direct cost)	%		10%			200,000	0.04	0.04	0.04	0.04	0.04	0.20
-	Budget allocation & Document preparation												
-	Appraisal for detailed design and cost												
-	Monitoring & checking in the field												
-	Inspection (Every Year from Year 1 till Year 4)												
-	Others												
V	**Ground Total (I+II+III)**						**2,200,000**	**0.24**	**0.24**	**0.24**	**0.24**	**0.24**	**1.20**

Note: The cost for protectoin is 400,000 VND/ha/yr. It is assumed that 1.73 MD is consumed to protect 1 ha of forest.

Table C-8 Cost Breakdown per ha of Protection of Natural Forest for Son La Province (FP-05)

Protection: 400,000 VND/ha/year

	Activity	Unit	Quantity	Norm	Cost (VND)			Annual Cost per ha (VND million)					
					Quantity	Unit cost	Amount	Year 1	Year 2	Year 3	Year 4	Year 5	Total
I	**Labor cost**				**0.00**	**0**	**2,000,000**	**0.29**	**0.29**	**0.29**	**0.29**	**0.29**	**1.44**
1	**Year 1**						**400,000**	**0.29**					**0.29**
1.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(112,000)						
2	**Year 2**						**400,000**		**0.29**				**0.29**
2.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(112,000)						
3	**Year 3**						**400,000**			**0.29**			**0.29**
3.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(112,000)						
4	**Year 4**						**400,000**				**0.29**		**0.29**
4.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(112,000)						
5	**Year 5**						**400,000**					**0.29**	**0.29**
5.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(112,000)						
II	**Material cost**				**Quantity**	**Unit cost**	**Amount**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
							0	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
1	Seedlings												
-	Economic species (exotic, fast growing)	tree											
	Indigenous species	tree											
III	**Indirect cost**				**Quantity**	**Unit cost**	**Amount**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
							200,000	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.20**
1	Management (10% of direct cost)	%		10%			200,000	0.04	0.04	0.04	0.04	0.04	0.20
-	Budget allocation & Document preparation												
-	Appraisal for detailed design and cost												
-	Monitoring & checking in the field												
-	Inspection (Every Year from Year 1 till Year 4)												
-	Others												
V	**Ground Total (I+II+III)**						**2,200,000**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**1.64**

Note: The cost for protectoin is 400,000 VND/ha/yr. It is assumed that 1.73 MD is consumed to protect 1 ha of forest.

Table C-9 Cost Breakdown per ha of Protection of Natural Forest for Copia-SUFMB (FP-06)

Protection: 400,000 VND/ha/year

	Activity	Unit	Quantity	Norm	Cost (VND)			Annual Cost per ha (VND million)					
					Quantity	Unit cost	Amount	Year 1	Year 2	Year 3	Year 4	Year 5	Total
I	**Labor cost**						**2,000,000**	**0.29**	**0.29**	**0.29**	**0.29**	**0.29**	**1.45**
1	**Year 1**						**400,000**	**0.29**					**0.29**
1.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(110,000)						
2	**Year 2**						**400,000**		**0.29**				**0.29**
2.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(110,000)						
3	**Year 3**						**400,000**			**0.29**			**0.29**
3.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(110,000)						
4	**Year 4**						**400,000**				**0.29**		**0.29**
4.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(110,000)						
5	**Year 5**						**400,000**					**0.29**	**0.29**
5.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(110,000)						
II	**Material cost**				**Quantity**	**Unit cost**	**Amount**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
1	Seedlings												
-	Economic species (exotic, fast growing)	tree											
	Indigenous species	tree											
III	**Indirect cost**				**Quantity**	**Unit cost**	**Amount**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
							200,000	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.20**
1	Management (10% of direct cost)	%		10%			200,000	0.04	0.04	0.04	0.04	0.04	0.20
-	Budget allocation & Document preparation												
-	Appraisal for detailed design and cost												
-	Monitoring & checking in the field												
-	Inspection (Every Year from Year 1 till Year 4)												
-	Others												
V	**Ground Total (I+II+III)**						**2,200,000**	**0.33**	**0.33**	**0.33**	**0.33**	**0.33**	**1.65**

Note: The cost for protectoin is 400,000 VND/ha/yr. It is assumed that 1.73 MD is consumed to protect 1 ha of forest.

Table C-10 Cost Breakdown per ha of Protection of Natural Forest for Thuan Chau PFMB (FP-07)

Protection: 400,000 VND/ha/year

	Activity	Unit	Quantity	Norm	Cost (VND)			Annual Cost per ha (VND million)					
					Quantity	Unit cost	Amount	Year 1	Year 2	Year 3	Year 4	Year 5	Total
I	**Labor cost**				**0.00**	**0**	**2,000,000**	**0.39**	**0.39**	**0.39**	**0.39**	**0.39**	**1.96**
1	**Year 1**						**400,000**	**0.39**					**0.39**
1.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(9,000)						
2	**Year 2**						**400,000**		**0.39**				**0.39**
2.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(9,000)						
3	**Year 3**						**400,000**			**0.39**			**0.39**
3.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(9,000)						
4	**Year 4**						**400,000**				**0.39**	**0.00**	**0.39**
4.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(9,000)						
5	**Year 5**						**400,000**					**0.39**	**0.39**
5.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(9,000)						
II	**Material cost**				**Quantity**	**Unit cost**	**Amount**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
							0	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
1	Seedlings												
-	Economic species (exotic, fast growing)	tree											
	Indigenous species	tree											
III	**Indirect cost**				**Quantity**	**Unit cost**	**Amount**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
							200,000	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.20**
1	Management (10% of direct cost)	%		10%			200,000	0.04	0.04	0.04	0.04	0.04	0.20
-	Budget allocation & Document preparation												
-	Appraisal for detailed design and cost												
-	Monitoring & checking in the field												
-	Inspection (Every Year from Year 1 till Year 4)												
-	Others												
V	**Ground Total (I+II+III)**						**2,200,000**	**0.43**	**0.43**	**0.43**	**0.43**	**0.43**	**2.16**

Note: The cost for protectoin is 400,000 VND/ha/yr. It is assumed that 1.73 MD is consumed to protect 1 ha of forest.

Table C-11 Cost Breakdown per ha of Protection of Natural Forest for Quynh Nhai PFMB (FP-08)

Protection: 400,000 VND/ha/year

	Activity	Unit	Quantity	Norm	Cost (VND)			Annual Cost per ha (VND million)					
					Quantity	Unit cost	Amount	Year 1	Year 2	Year 3	Year 4	Year 5	Total
I	**Labor cost**				**0.00**	**0**	**2,000,000**	**0.19**	**0.19**	**0.19**	**0.19**	**0.19**	**0.95**
1	**Year 1**						**400,000**	**0.19**					**0.19**
1.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(211,000)						
2	**Year 2**						**400,000**		**0.19**				**0.19**
2.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(211,000)						
3	**Year 3**						**400,000**			**0.19**			**0.19**
3.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(211,000)						
4	**Year 4**						**400,000**				**0.19**		**0.19**
4.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(211,000)						
5	**Year 5**						**400,000**					**0.19**	**0.19**
5.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(211,000)						
II	**Material cost**				**Quantity**	**Unit cost**	**Amount**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
							0	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
1	Seedlings												
-	Economic species (exotic, fast growing)	tree											
	Indigenous species	tree											
III	**Indirect cost**				**Quantity**	**Unit cost**	**Amount**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
							200,000	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.20**
1	Management (10% of direct cost)	%		10%			200,000	0.04	0.04	0.04	0.04	0.04	0.20
-	Budget allocation & Document preparation												
-	Appraisal for detailed design and cost												
-	Monitoring & checking in the field												
-	Inspection (Every Year from Year 1 till Year 4)												
-	Others												
V	**Ground Total (I+II+III)**						**2,200,000**	**0.23**	**0.23**	**0.23**	**0.23**	**0.23**	**1.15**

Note: The cost for protectoin is 400,000 VND/ha/yr. It is assumed that 1.73 MD is consumed to protect 1 ha of forest.

Table C-12 Cost Breakdown per ha of Protection of Natural Forest for Xuan Nha SUFMB (FP-09)

Protection: 400,000 VND/ha/year

	Activity	Unit	Quantity	Norm	Cost (VND)			Annual Cost per ha (VND million)					
					Quantity	Unit cost	Amount	Year 1	Year 2	Year 3	Year 4	Year 5	Total
I	**Labor cost**				**0.00**	**0**	**2,000,000**	**0.19**	**0.19**	**0.19**	**0.19**	**0.19**	**0.95**
1	**Year 1**						**400,000**	**0.19**					**0.19**
1.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(211,000)						
2	**Year 2**						**400,000**		**0.19**				**0.19**
2.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(211,000)						
3	**Year 3**						**400,000**			**0.19**			**0.19**
3.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(211,000)						
4	**Year 4**						**400,000**				**0.19**	**0.00**	**0.19**
4.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(211,000)						
5	**Year 5**						**400,000**					**0.19**	**0.19**
5.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(211,000)						
II	**Material cost**				**Quantity**	**Unit cost**	**Amount**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
							0	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
1	Seedlings												
-	Economic species (exotic, fast growing)	tree											
	Indigenous species	tree											
III	**Indirect cost**				**Quantity**	**Unit cost**	**Amount**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
							200,000	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.20**
1	Management (10% of direct cost)	%		10%			200,000	0.04	0.04	0.04	0.04	0.04	0.20
-	Budget allocation & Document preparation												
-	Appraisal for detailed design and cost												
-	Monitoring & checking in the field												
-	Inspection (Every Year from Year 1 till Year 4)												
-	Others												
V	**Ground Total (I+II+III)**						**2,200,000**	**0.23**	**0.23**	**0.23**	**0.23**	**0.23**	**1.15**

Note: The cost for protectoin is 400,000 VND/ha/yr. It is assumed that 1.73 MD is consumed to protect 1 ha of forest.

Table C-13 Cost Breakdown per ha of Protection of Natural Forest for Hoa Binh Province (FP-10)

Protection: 400,000 VND/ha/year

	Activity	Unit	Quantity	Norm	Cost (VND)			Annual Cost per ha (VND million)					
					Quantity	Unit cost	Amount	Year 1	Year 2	Year 3	Year 4	Year 5	Total
I	**Labor cost**				**0.00**	**0**	**2,000,000**	**0.27**	**0.27**	**0.27**	**0.27**	**0.27**	**1.35**
1	**Year 1**						**400,000**	**0.27**					**0.27**
1.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(130,000)						
2	**Year 2**						**400,000**		**0.27**				**0.27**
2.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(130,000)						
3	**Year 3**						**400,000**			**0.27**			**0.27**
3.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(130,000)						
4	**Year 4**						**400,000**				**0.27**		**0.27**
4.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(130,000)						
5	**Year 5**						**400,000**					**0.27**	**0.27**
5.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(130,000)						
II	**Material cost**				**Quantity**	**Unit cost**	**Amount**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
							0	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
1	Seedlings												
-	Economic species (exotic, fast growing)	tree											
	Indigenous species	tree											
III	**Indirect cost**				**Quantity**	**Unit cost**	**Amount**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
							200,000	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.20**
1	Management (10% of direct cost)	%		10%			200,000	0.04	0.04	0.04	0.04	0.04	0.20
-	Budget allocation & Document preparation												
-	Appraisal for detailed design and cost												
-	Monitoring & checking in the field												
-	Inspection (Every Year from Year 1 till Year 4)												
-	Others												
V	**Ground Total (I+II+III)**						**2,200,000**	**0.31**	**0.31**	**0.31**	**0.31**	**0.31**	**1.55**

Note: The cost for protectoin is 400,000 VND/ha/yr. It is assumed that 1.73 MD is consumed to protect 1 ha of forest.

Table C-14 Cost Breakdown per ha of Protection of Natural Forest for Ngoc Son-Ngo Luong SUFMB (FP-11)

Protection: 400,000 VND/ha/year

	Activity	Unit	Quantity	Norm	Cost (VND)			Annual Cost per ha (VND million)					
					Quantity	Unit cost	Amount	Year 1	Year 2	Year 3	Year 4	Year 5	Total
I	**Labor cost**				**0.00**	**0**	**2,000,000**	**0.40**	**0.40**	**0.40**	**0.40**	**0.40**	**2.00**
1	**Year 1**						**400,000**	**0.40**					**0.40**
1.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			0						
2	**Year 2**						**400,000**		**0.40**				**0.40**
2.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			0						
3	**Year 3**						**400,000**			**0.40**			**0.40**
3.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			0						
4	**Year 4**						**400,000**				**0.40**	**0.00**	**0.40**
4.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			0						
5	**Year 5**						**400,000**					**0.40**	**0.40**
5.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			0						
II	**Material cost**				**Quantity**	**Unit cost**	**Amount**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
							0	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
1	Seedlings												
-	Economic species (exotic, fast growing)	tree											
	Indigenous species	tree											
III	**Indirect cost**				**Quantity**	**Unit cost**	**Amount**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
							200,000	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.20**
1	Management (10% of direct cost)	%		10%			200,000	0.04	0.04	0.04	0.04	0.04	0.20
-	Budget allocation & Document preparation												0.00
-	Appraisal for detailed design and cost												
-	Monitoring & checking in the field												
-	Inspection (Every Year from Year 1 till Year 4)												
-	Others												
V	**Ground Total (I+II+III)**						**2,200,000**	**0.44**	**0.44**	**0.44**	**0.44**	**0.44**	**2.20**

Note: The cost for protectoin is 400,000 VND/ha/yr. It is assumed that 1.73 MD is consumed to protect 1 ha of forest.

Table C-15 Cost Breakdown per ha of Protection of Natural Forest for HANG Kia - Pa Co SUFMB (FP-12)

Protection: 400,000 VND/ha/year

	Activity	Unit	Quantity	Norm	Cost (VND)			Annual Cost per ha (VND million)					
					Quantity	Unit cost	Amount	Year 1	Year 2	Year 3	Year 4	Year 5	Total
I	**Labor cost**				**0.00**	**0**	**2,000,000**	**0.40**	**0.40**	**0.40**	**0.40**	**0.40**	**2.00**
1	**Year 1**						**400,000**	**0.40**					**0.40**
1.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			0						
2	**Year 2**						**400,000**		**0.40**				**0.40**
2.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			0						
3	**Year 3**						**400,000**			**0.40**			**0.40**
3.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			0						
4	**Year 4**						**400,000**				**0.40**	**0.00**	**0.40**
4.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			0						
5	**Year 5**						**400,000**					**0.40**	**0.40**
5.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			0						
II	**Material cost**				**Quantity**	**Unit cost**	**Amount**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
							0	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
1	Seedlings												
-	Economic species (exotic, fast growing)	tree											
	Indigenous species	tree											
III	**Indirect cost**				**Quantity**	**Unit cost**	**Amount**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
							200,000	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.20**
1	Management (10% of direct cost)	%		10%			200,000	0.04	0.04	0.04	0.04	0.04	0.20
-	Budget allocation & Document preparation												
-	Appraisal for detailed design and cost												
-	Monitoring & checking in the field												
-	Inspection (Every Year from Year 1 till Year 4)												
-	Others												
V	**Ground Total (I+II+III)**						**2,200,000**	**0.44**	**0.44**	**0.44**	**0.44**	**0.44**	**2.20**

Note: The cost for protectoin is 400,000 VND/ha/yr. It is assumed that 1.73 MD is consumed to protect 1 ha of forest.

Table C-16 Cost Breakdown per ha of Protection of Natural Forest for Phu Canh SUFMB (FP-13)

Protection: 400,000 VND/ha/year

	Activity	Unit	Quantity	Norm	Cost (VND)			Annual Cost per ha (VND million)					
					Quantity	Unit cost	Amount	Year 1	Year 2	Year 3	Year 4	Year 5	Total
I	**Labor cost**				**0.00**	**0**	**2,000,000**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**1.25**
1	**Year 1**						**400,000**	**0.25**					**0.25**
1.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(151,000)						
2	**Year 2**						**400,000**		**0.25**				**0.25**
2.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(151,000)						
3	**Year 3**						**400,000**			**0.25**			**0.25**
3.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(151,000)						
4	**Year 4**						**400,000**				**0.25**	**0.00**	**0.25**
4.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(151,000)						
5	**Year 5**						**400,000**					**0.25**	**0.25**
5.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(151,000)						
II	**Material cost**				**Quantity**	**Unit cost**	**Amount**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
							0	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
1	Seedlings												
-	Economic species (exotic, fast growing)	tree											
	Indigenous species	tree											
III	**Indirect cost**				**Quantity**	**Unit cost**	**Amount**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
							200,000	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.20**
1	Management (10% of direct cost)	%		10%			200,000	0.04	0.04	0.04	0.04	0.04	0.20
-	Budget allocation & Document preparation												
-	Appraisal for detailed design and cost												
-	Monitoring & checking in the field												
-	Inspection (Every Year from Year 1 till Year 4)												
-	Others												
V	**Ground Total (I+II+III)**						**2,200,000**	**0.29**	**0.29**	**0.29**	**0.29**	**0.29**	**1.45**

Note: The cost for protectoin is 400,000 VND/ha/yr. It is assumed that 1.73 MD is consumed to protect 1 ha of forest.

Table C-17 Cost Breakdown per ha of Protection of Natural Forest for Da River Watershed PFMB (FP-14)

Protection: 400,000 VND/ha/year

	Activity	Unit	Quantity	Norm	Cost (VND)			Annual Cost per ha (VND million)					
					Quantity	Unit cost	Amount	Year 1	Year 2	Year 3	Year 4	Year 5	Total
I	**Labor cost**				**0.00**	**0**	**2,000,000**	**0.20**	**0.20**	**0.20**	**0.20**	**0.20**	**1.00**
1	**Year 1**						**400,000**	**0.20**					**0.20**
1.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(200,000)						
2	**Year 2**						**400,000**		**0.20**				**0.20**
2.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(200,000)						
3	**Year 3**						**400,000**			**0.20**			**0.20**
3.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(200,000)						
4	**Year 4**						**400,000**				**0.20**	**0.00**	**0.20**
4.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(200,000)						
5	**Year 5**						**400,000**					**0.20**	**0.20**
5.1	Protection *	ha	-	-			400,000						
-	PFES	ha	-	-			(200,000)						
II	**Material cost**				**Quantity**	**Unit cost**	**Amount**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
							0	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
1	Seedlings												
-	Economic species (exotic, fast growing)	tree											
	Indigenous species	tree											
III	**Indirect cost**				**Quantity**	**Unit cost**	**Amount**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
							200,000	**0.04**	**0.04**	**0.04**	**0.04**	**0.04**	**0.20**
1	Management (10% of direct cost)	%		10%			200,000	0.04	0.04	0.04	0.04	0.04	0.20
-	Budget allocation & Document preparation												
-	Appraisal for detailed design and cost												
-	Monitoring & checking in the field												
-	Inspection (Every Year from Year 1 till Year 4)												
-	Others												
V	**Ground Total (I+II+III)**						**2,200,000**	**0.24**	**0.24**	**0.24**	**0.24**	**0.24**	**1.20**

Note: The cost for protectoin is 400,000 VND/ha/yr. It is assumed that 1.73 MD is consumed to protect 1 ha of forest.

Table C-18 Cost Breakdown per ha of Assisted Natural Regeneration in the Watershed (ANR-01)

Unit cost/MD: 231,000 Protection: 400,000 VND/ha/year

	Activity	Unit	Quantity	Norm	Cost (VND)			Annual Cost per ha (VND million)					
					Man-day	Unit cost	Amount	Year 1	Year 2	Year 3	Year 4	Year 5	Total
I	**Labor cost**				**27.18**		**6,278,522**	**1.83**	**1.83**	**1.83**	**0.40**	**0.40**	**6.28**
1	**Year 1**				**7.91**		**1,826,174**	**1.83**					**1.83**
1.1	Assistance for the natural regeneration												
-	Clearing climers and insects affected trees	m^2	10,000	2,500	4.00	231,000	924,000						
-	Stops weeding for regenerating trees (300 trees/ha)	tree	300	138	2.17	231,000	502,174						
-	Forest Protection	ha	1	0.58	1.73	231,000	400,000						
2	**Year 2**				**7.91**		**1,826,174**		**1.83**				**1.83**
2.1	Assistance for the natural regeneration												
-	Clearing climers and imsects affected trees	m2	10,000	2,500	4.00	231,000	924,000						
-	Stops weeding for the regenerating trees (300 trees/ha)	tree	300	138	2.17	231,000	502,174						
-	Forest Protection	ha	1	0.58	1.73	231,000	400,000						
3	**Year 3**				**7.91**		**1,826,174**			**1.83**			**1.83**
3.1	Assistance for the natural regeneration												
-	Clearing climers and imsects affected trees	m^2	10,000	2,500	4.00	231,000	924,000						
-	Stops weeding for the regenerating trees (300 trees/ha)	tree	300	138	2.17	231,000	502,174						
-	Forest Protection	ha	1	0.58	1.73	231,000	400,000						
4	**Year 4**				**1.73**		**400,000**				**0.40**		**0.40**
-	Forest Protection	ha	1	0.58	1.73	231,000	400,000						
5	**Year 5**				**1.73**		**400,000**					**0.40**	**0.40**
-	Forest Protection	ha	1	0.58	1.73	231,000	400,000						
II	**Material cost**				**Quantity**	**Unit cost**	**Amount**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
1	Seedlings												
-	Economic species (exotic, fast growing)	tree											
-	Indigenous species	tree											
III	**Indirect cost**				**Quantity**	**Unit cost**	**Amount**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
							627,852	**0.18**	**0.18**	**0.18**	**0.04**	**0.04**	**0.63**
1	Management (10% of direct cost(I+II))	%		10%			627,852	0.18	0.18	0.18	0.04	0.04	0.63
-	Budget allocation & Document preparation												
-	Appraisal for detailed design and cost												
-	Monitoring & checking in the field												
-	Inspection (Every Year from Year 1 till Year 4)												
-	Others												
IV	**Ground Total (I+II+III)**						**6,906,374**	**2.01**	**2.01**	**2.01**	**0.44**	**0.44**	**6.91**

Note: The cost for protectoin is 400,000 VND/ha/yr. It is assumed that 1.73 MD is consumed to protect 1 ha of forest.

Table C-19 Estimated Cost of Forestry Development in Dien Bien Province

Proposed Forest Development Plan

Province	Sub-component	Model	Batch	Area (ha)	2017 Year 1	2018 Year 2	2019 Year 3	2020 Year 4	2021 Year 5	2022 Year 6	2023 Year 7	2024 Year 8	2025 Year 9	2026 Year 10
					Area planted , maintained or protected (ha)									
Dien Bien	(1) Afforestation for PF		Total	3,160	0	0	0	632	1,896	3,160	3,160	2,528	1,264	0
		AFF-01	Batch 1	632				632	632	632	632			
			Batch 2	1,264					1,264	1,264	1,264	1,264		
			Batch 3	1,264						1,264	1,264	1,264	1,264	
	(1) Afforestation for NR forest		Total	0	0	0	0	0	0	0	0	0	0	0
		AFF-02	Batch 1	0				0	0	0	0			
			Batch 2	0					0	0	0	0		
			Batch 3	0						0	0	0	0	
	(2) Forest Protection (5 yrs)		Total	10,400	0	0	0	4,160	10,400	10,400	10,400	10,400	6,240	0
		FP-01	Batch 1	4,160				4,160	4,160	4,160	4,160	4,160		
			Batch 2	6,240					6,240	6,240	6,240	6,240	6,240	
	(3) ANR		Total	2,310	0	0	0	924	2,310	2,310	2,310	2,310	1,386	0
		ANR-01	Batch 1	924				924	924	924	924	924		
			Batch 2	1,386					1,386	1,386	1,386	1,386	1,386	

Estimated Cost of Forest Development

Province	Sub-component	Model	Batch	Total cost (mil VND/ha)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
					Annual Cost of Forest Development (mil. VND)									
Dien Bien	(1) Afforestation for PF		Total	170,233	0	0	0	16,915	42,152	56,817	31,796	17,618	4,934	0
		AFF-01	Batch 1	34,047				16,915	8,323	6,342	2,467			
			Batch 2	68,093					33,830	16,645	12,684	4,934		
			Batch 3	68,093						33,830	16,645	12,684	4,934	
	(1) Afforestation for NR forest		Total	0	0	0	0	0	0	0	0	0	0	0
		AFF-02	Batch 1	0				0	0	0	0			
			Batch 2	0					0	0	0	0		
			Batch 3	0						0	0	0	0	
	(2) Forest Protection (5 yrs)		Total	16,900	0	0	0	1,352	3,380	3,380	3,380	3,380	2,028	0
		FP-01	Batch 1	6,760				1,352	1,352	1,352	1,352	1,352		
			Batch 2	10,140					2,028	2,028	2,028	2,028	2,028	
	(3) ANR		Total	15,954	0	0	0	1,856	4,640	4,640	3,191	1,016	610	0
		ANR-01	Batch 1	6,381				1,856	1,856	1,856	407	407		
			Batch 2	9,572					2,784	2,784	2,784	610	610	

Table C-20 Estimated Cost of Forestry Development in Lai Chau Province

Proposed Forest Development Plan

				Area	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
					Area planted , maintained or protected (ha)									
				(ha)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Lai Chau	(1) Afforestation for PF		Total	6,550	0	0	0	1,310	3,930	6,550	6,550	5,240	2,620	0
		AFF-01	Batch 1	1,310				1,310	1,310	1,310	1,310			
			Batch 2	2,620					2,620	2,620	2,620	2,620		
			Batch 3	2,620						2,620	2,620	2,620	2,620	
	(1) Afforestation for NR forest		Total	0	0	0	0	0	0	0	0	0	0	0
		AFF-02	Batch 1	0				0	0	0	0			
			Batch 2	0					0	0	0	0		
			Batch 3	0						0	0	0	0	
	(2) Forest Protection (5 yrs)		Total	0	0	0	0	0	0	0	0	0	0	0
		FP-01	Batch 1	0				0	0	0	0	0		
			Batch 2	0					0	0	0	0	0	
	(3) ANR		Total	7,500	0	0	0	3,000	7,500	7,500	7,500	7,500	4,500	0
		ANR-01	Batch 1	3,000				3,000	3,000	3,000	3,000	3,000		
			Batch 2	4,500					4,500	4,500	4,500	4,500	4,500	

Estimated Cost of Forest Development

Province	Sub-component	Model	Batch	Total cost	Annual Cost of Forest Development (mil. VND)									
				(mil VND/ha)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Lai Chau	(1) Afforestation for PF		Total	352,857	0	0	0	35,061	87,373	117,769	65,907	36,519	10,227	0
		AFF-01	Batch 1	70,571				35,061	17,251	13,146	5,114			
			Batch 2	141,143					70,122	34,502	26,291	10,227		
			Batch 3	141,143						70,122	34,502	26,291	10,227	
	(1) Afforestation for NR forest		Total	0	0	0	0	0	0	0	0	0	0	0
		AFF-02	Batch 1	0				0	0	0	0			
			Batch 2	0					0	0	0	0		
			Batch 3	0						0	0	0	0	
	(2) Forest Protection (5 yrs)		Total	0	0	0	0	0	0	0	0	0	0	0
		FP-01	Batch 1	0				0	0	0	0	0		
			Batch 2	0					0	0	0	0	0	
	(3) ANR		Total	51,798	0	0	0	6,026	15,066	15,066	10,360	3,300	1,980	0
		ANR-01	Batch 1	20,719				6,026	6,026	6,026	1,320	1,320		
			Batch 2	31,079					9,040	9,040	9,040	1,980	1,980	

Table C-21 Estimated Cost of Forestry Development in Son La Province

Proposed Forest Development Plan

Province	Sub-component	Model	Batch	Area	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
					Area planted , maintained or protected (ha)									
				(ha)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Son La	(1) Afforestation for PF		Total	2,160	0	0	0	432	1,296	2,160	2,160	1,728	864	0
		AFF-01	Batch 1	432				432	432	432	432			
			Batch 2	864					864	864	864	864		
			Batch 3	864						864	864	864	864	
	(1) Afforestation for NR forest		Total	1,060	0	0	0	212	636	1,060	1,060	848	424	0
		AFF-02	Batch 1	212				212	212	212	212			
			Batch 2	424					424	424	424	424		
			Batch 3	424						424	424	424	424	
	(2) Forest Protection (5 yrs)		Total	9,900	0	0	0	3,960	9,900	9,900	9,900	9,900	5,940	0
		FP-01	Batch 1	3,960				3,960	3,960	3,960	3,960	3,960		
			Batch 2	5,940					5,940	5,940	5,940	5,940	5,940	
	(3) ANR		Total	2,470	0	0	0	988	2,470	2,470	2,470	2,470	1,482	0
		ANR-01	Batch 1	988				988	988	988	988	988		
			Batch 2	1,482					1,482	1,482	1,482	1,482	1,482	

Estimated Cost of Forest Development

Province	Sub-component	Model	Batch	Total cost	Annual Cost of Forest Development (mil. VND)									
				(mil VND/ha)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Son La	(1) Afforestation for PF		Total	116,362	0	0	0	11,562	28,813	38,837	21,734	12,043	3,373	0
		AFF-01	Batch 1	23,272				11,562	5,689	4,335	1,686			
			Batch 2	46,545					23,124	11,378	8,670	3,373		
			Batch 3	46,545						23,124	11,378	8,670	3,373	
	(1) Afforestation for NR forest		Total	35,859	0	0	0	3,886	9,437	4,501	2,791	900	0	0
		AFF-02	Batch 1	7,172				3,886	1,665	1,171	450			
			Batch 2	14,343					7,772	3,330	2,341	900		
			Batch 3	14,343						7,772	3,330	2,341	900	
	(2) Forest Protection (5 yrs)		Total	16,236	0	0	0	1,299	3,247	3,247	3,247	3,247	1,948	0
		FP-01	Batch 1	6,494				1,299	1,299	1,299	1,299	1,299		
			Batch 2	9,742					1,948	1,948	1,948	1,948	1,948	
	(3) ANR		Total	17,059	0	0	0	1,985	4,962	4,962	3,412	1,087	652	0
		ANR-01	Batch 1	6,823				1,985	1,985	1,985	435	435		
			Batch 2	10,235					2,977	2,977	2,977	652	652	

Table C-22 Estimated Cost of Forestry Development in Hoa Binh Province

Proposed Forest Development Plan

Province	Sub-component	Model	Batch	Area	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
					Area planted , maintained or protected (ha)									
				(ha)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Hoa Binh	(1) Afforestation for PF		Total	2,060	0	0	0	412	1,236	2,060	2,060	1,648	824	0
		AFF-01	Batch 1	412				412	412	412	412			
			Batch 2	824					824	824	824	824		
			Batch 3	824						824	824	824	824	
	(1) Afforestation for NR forest		Total	1,020	0	0	0	204	612	1,020	1,020	816	408	0
		AFF-02	Batch 1	204				204	204	204	204			
			Batch 2	408					408	408	408	408		
			Batch 3	408						408	408	408	408	
	(2) Forest Protection (5 yrs)		Total	24,880	0	0	0	9,952	24,880	24,880	24,880	24,880	14,928	0
		FP-01	Batch 1	9,952				9,952	9,952	9,952	9,952	9,952		
			Batch 2	14,928					14,928	14,928	14,928	14,928	14,928	
	(3) ANR		Total	840	0	0	0	336	840	840	840	840	504	0
		ANR-01	Batch 1	336				336	336	336	336	336		
			Batch 2	504					504	504	504	504	504	

Estimated Cost of Forest Development

Province	Sub-component	Model	Batch	Total cost	Annual Cost of Forest Development (mil. VND)									
				(mil VND/ha)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Hoa Binh	(1) Afforestation for PF		Total	110,975	0	0	0	11,027	27,479	37,039	20,728	11,485	3,217	0
Watershed		AFF-01	Batch 1	22,195				11,027	5,425	4,134	1,608			
			Batch 2	44,390					22,054	10,851	8,269	3,217		
			Batch 3	44,390						22,054	10,851	8,269	3,217	
	(1) Afforestation for NR forest		Total	34,505	0	0	0	3,739	9,081	11,810	5,891	3,119	866	0
		AFF-02	Batch 1	6,901				3,739	1,602	1,126	433			
			Batch 2	13,802					7,478	3,205	2,253	866		
			Batch 3	13,802						7,478	3,205	2,253	866	
	(2) Forest Protection (5 yrs)		Total	38,564	0	0	0	3,085	7,713	7,713	7,713	7,713	4,628	0
		FP-01	Batch 1	15,426				3,085	3,085	3,085	3,085	3,085		
			Batch 2	23,138					4,628	4,628	4,628	4,628	4,628	
	(3) ANR		Total	5,801	0	0	0	675	1,687	1,687	1,160	370	222	0
		ANR-01	Batch 1	2,321				675	675	675	148	148		
			Batch 2	3,481					1,012	1,012	1,012	222	222	

Table C-23 Annual Cost Estimation of Forestry Development by Province

Project components	Unit	Q'ty	Unit Cost (mil. VND)	TOTAL		4th (2020)		5th (2021)		6th (2022)		7th (2023)		8th (2024)		9th (2025)	
				LC	FC	LC	FC	LC	FC	LC	FC	LC	FC	LC	FC	LC	FC
Dien Bien																	
4 Development of Watershed Protection Forest				**203,087**		**20,123**		**50,173**		**64,837**		**38,367**		**22,015**		**7,572**	
(1) Afforestation for Protection Forest	ha	**3,160**	53.87	170,233		16,915		42,152		56,817		31,796		17,618		4,934	
(1) Afforestation for Natural Reserve Forest	ha																
(2) Forest Protection (5 years)	ha	**10,400**	1.63	16,900		1,352		3,380		3,380		3,380		3,380		2,028	
(3) ANR	ha	**2,310**	6.91	15,954		1,856		4,640		4,640		3,191		1,016		610	
Lai Chau																	
4 Development of Watershed Protection Forest				**404,655**		**41,087**		**102,439**		**132,835**		**76,266**		**39,819**		**12,207**	
(1) Afforestation for Protection Forest	ha	**6,550**	53.87	352,857		35,061		87,373		117,770		65,907		36,519		10,227	
(1) Afforestation for Natural Reserve Forest	ha																
(2) Forest Protection (5 years)	ha																
(3) ANR	ha	**7,500**	6.91	51,798		6,026		15,066		15,066		10,360		3,300		1,980	
Son La																	
4 Development of Watershed Protection Forest				**170,520**		**18,732**		**46,459**		**51,547**		**31,184**		**17,277**		**5,321**	
(1) Afforestation for Protection Forest	ha	**2,160**	53.87	116,362		11,562		28,813		38,837		21,734		12,043		3,373	
(1) Afforestation for Natural Reserve Forest	ha	**1,060**	33.83	21,515		3,886		9,437		4,501		2,791		900			
(2) Forest Protection (5 years)	ha	**9,900**	1.64	16,236		1,299		3,247		3,247		3,247		3,247		1,948	
(3) ANR	ha	**2,470**	6.91	16,407		1,985		4,962		4,962		3,412		1,087			
Hoa Binh																	
4 Development of Watershed Protection Forest				**189,846**		**18,526**		**45,960**		**58,249**		**35,492**		**22,687**		**8,932**	
(1) Afforestation for Protection Forest	ha	**2,060**	53.87	110,975		11,027		27,479		37,039		20,728		11,485		3,217	
(1) Afforestation for Natural Reserve Forest	ha	**1,020**	33.83	34,505		3,739		9,081		11,810		5,891		3,119		866	
(2) Forest Protection (5 years)	ha	**24,880**	1.55	38,564		3,085		7,713		7,713		7,713		7,713		4,628	
(3) ANR	ha	**840**	6.91	5,801		675		1,687		1,687		1,160		370		222	

Annex D

Annex D Standard Designs and Estimated Costs for Development of Silviculture Infrastructure

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Annex D: Standard Designs and Estimated Costs for Development of Silviculture Infrastructure

D.1. Proposed Silviculture Infrastructure

D.1.1 List of Silviculture Infrastructures provided by Forest Management Boards

To facilitate the implementation of the forestry development sub-components and long term management of the project areas, there is a need to construct and develop the silviculture infrastructures relating to the project areas. The following target figures were determined after a careful review of the proposals submitted by PFMBs/SUFMBs and DARDs of the 4 provinces.

List of Silviculture Infrastructures

Province	District	FMB	Motorbike /Forestry Road	Foot Path	Fire Break Line	Fire Watch Tower	Forest Management Board Office	Forest Guard Station	Information Board	Nursery
			km	km	km	no.	no.	no.	no.	no.
Dien Bien	Dien Bien	Dien Bien PFMB	13.8	0.0	28.0	0	0	2	3	0
		Muong Phang NRMB	0.0	0.0	0.0	0	0	4	0	0
	Muong Cha	Muong Cha PFMB	0.0	0.0	16.0	0	0	2	3	1
		Muong Cha PFMB (Unallocated)	20.6	0.0	0.0	0	0	3	0	0
	Tuan Giao	Tuan Giao PFMB	13.6	0.0	16.0	4	0	3	4	0
	Subtotal		48.0	0.0	60.0	4	0	14	10	1
Lai Cahi	Sin Ho	Nam Ma PFMB	12.0	0.0	27.0	4	0	2	7	0
		Nam Na PFMB	12.0	0.0	30.0	2	0	2	2	1
	Than Uyen	Than Uyen PFMB	12.0	0.0	36.0	3	0	1	2	1
	Tan Uyen	Tan Uyen PFMB	12.0	0.0	21.0	2	0	3	3	2
	Subtotal		48.0	0.0	114.0	11	0	8	14	4
Son La	Thuan Chau	Copia SUFMB	2.0	6.0	11.0	3	1	2	9	0
	Xuna Nha	Thuan Chau PFMB	11.5	0.0	30.0	3	0	1	0	3
	Moc Chau Van Ho	Xuan Nha SUFMB	0.0	18.0	0.0	2	0	1	4	0
	Quynh Nhai	Quynh Nhai PFMB	0.0	6.0	7.0	2	0	1	4	0
	Subtotal		13.5	30.0	48.0	10	1	5	17	3
Hoa Binh	Da Bac	Phu Canh SUFMB	0.0	0.0	11.0	1	0	2	0	1
		Da river PFMB	12.0	0.0	36.0	0	0	1	11	1
	Lac sonTan Lac	Ngoc Son - Ngo Luong SUFMB	0.0	0.0	9.0	1	0	2	6	0
	Mai Chau	Hang Kia - Pa Co SUFMB	0.0	0.0	0.0	2	0	1	1	0
	Subtotal		12.0	0.0	56.0	4	0	6	18	2
Total			121.5	30.0	278.0	29	1	33	59	10

Note: The number of signboard is not listed in the table above, as it should be installed by PFMBs/SUFMBs as parts of their routine works, although some PFMBs/SUFMBs requested the installation of signboards and it was confirmed that a total of 71 signboards were planned in the project areas.

Source: JICA preparatory survey team based on the lists provided by PFMBs (2016)

(1) Motorbike road/ Forestry road

The road for transportation of seedlings for afforestation is essential facility. Usually, any afforestation projects need to construction of forest roads which are prescribed by the forestry road regulation. However, the target areas are located in the mountainous areas and wide forest roads which follow the regulation have risk to damage the mountain slope. And generally, in the project area the following seedling transportation methodology is taken. 1) transportation by truck through rural road from nursery to boundary of forest area, 2) transportation by motorbike through motorbike roads in the forest area, and 3) transportation by man power through foot pass until the plantation sites. Thus, it is considered to take the

general methodology of seedling transportation instead of construction of wide forest road and motorbike road is planned to be constructed.

The width of the motorbike road is 2.5m and 0.25m of road shoulders, totally 3.0m width. The 2.5m width is paved by crushed stones with 0.05m thickness. Due to steep slope area, some places drainage is constructed and 4 culverts per 1 km road length is planned to prevent inundation or damage by some natural disasters caused by rainfall mainly such as, land slide, flashflood, flood, etc.

Although the motorbike road is generally recommendable from the environmental point of view, it is also possible to apply the standard design of forestry road in the areas where no adverse environmental impact is foreseen or no huge construction cost for protection works are required. In such cases, the standard design for Grade IV forestry road (TCVN 7025, 2002, the Directorate for Standards, Metrology and Quality proposal, the Ministry of Science, Technology and Environment) should be applied in consideration of the sloping conditions of the target areas. The following table shows the standard designs of the forestry roads from Grade I to IV.

The Standard Design of Forest Road

Item	Grade of forest road			
	I	II	III	**IV**
Speed (km.hr) (not steep mountain - steep mountain)	25 - 30	20 - 25	15 - 20	**10 - 10**
Slope (%) (not steep mountain - steep mountain)	8- 9	9 - 10	10 - 11	**11 -12**
Lane	2	1	1	**1**
Wide (m)	3.0	3.5	3.0	**-**
Road shoulder (m) x 2	0.5	0.5	0.75	**-**
Total width (m)	7.0	6.5	4.5	**4.5**

Source: TCVN 7025, 2002, the Directorate for Standards, Metrology and Quality proposal, the Ministry of Science, Technology and Environment

Unless the following conditions can be fulfilled, the forestry road, even Grade IV, should be avoided but the motorbike road is advisable instead.

- There is no forest vegetation in the proposed route;
- There is no resettlement, loss of livelihood, or land acquisition caused by development of the forest road; and
- The sites where the proposed route is planned are not too steep to develop the 4-meter wide road.

(2) Foot path

The motorbike roads located in the nature reserve areas and special use forest areas are not selected because no afforestation sub-component is planned. For the management of the forest area, foot pass will be used. The width of foot pass is about 80cm, no earthwork is required. But some sections require cutting bush and grasses.

(3) Forest Firebreak line

Plantations and natural forests in the project areas are always exposed to the high risk of wild fire. In particular, the young plantations (less than five years) are vulnerable to the damage of fire and fire damage has often caused the extensive mortality of young trees. To prevent and minimize such damage, firebreak line should be constructed around and within the plantations.

Firebreak line proposed in the project is a band of bare land of 10m in width. It should be maintained or cleared every year for maintenance.

The model of firebreak line is considered with afforestation unit as 500 m squire area (25 ha). The project area is located close to residential areas or the afforestation site is surrounded by the residential area. Due to the afforestation areas' location, it is assumed that the risk of forest fire from the outside of the forest is high. Therefore, the firebreak line is planned inside of the afforestation area. The model of forest fire line is set to divide the afforestation area into two areas. The length of firebreak line is 500 m per 25 ha, equal to 2 % of the afforestation area.

(4) Fire watching tower

The main purpose of the construction of fire watch tower is to detect fire breakout in the early stage so that fire extinction activities can be conducted to suppress forest fire before its spreading out to the adjacent areas. Fire watch towers should be constructed at strategic locations where the surrounding areas can be viewed from. It will be 10 meters high and made of reinforced concrete frame.

(5) Forest guard station

Forest guard station will be used for a site office-cum-rest house for the staff of PFMB and the place for meetings with the forest management groups. It should be built at the strategic location adjacent to or within the project areas. One story building with bed room, meeting room, office room, kitchen and toilet is the standard design for the station.

(6) Forest management board office

Copia special used forest management board does not have office yet, because this MB is established recently. The office is essential for forest management, therefore, one office is planned to be built by the Project.

(7) Information board

Information board will be set up around the project site to notify the public that the area is being protected by PFMB and a forest management group as protection forest. The board to be installed will be about 3 m wide and about 2.5 m high with one 0.5 m height for foundation. The regulations or rule defined by PFMB and a forest management group for protection of the project area will be displayed in the board.

(8) Sign board

Sign board is a small plate attached to existing standing trees and other visible places to give warning against forest fires or illegal cutting to anyone who might cause such problems. The installation of signboard is not planned in the project as it is a part of the routine works of forest management boards and its associated cost can be easily covered by the management fee of the forest management boards.

(9) Nursery

Afforestation o will require a large quantity of seedlings at a time. Most of the seedlings will be purchased from the seedling providers. However, some afforestation sites located in a remote area require temporary nurseries, because the seedlings will be damaged by long

transportation from existing nurseries. Therefore, some nurseries are planned. Nurseries should also be constructed at strategic points where seedlings produced can be transported to the project areas without any damage during transportation. The standard capacities of the nurseries are about 60,000 seedlings.

D.2 Typical designs of the silviculture infrastructures

Typical designs of the silviculture infrastructures are presented in **Figures D-1 to D-6** attached to this Annex. The volume of works and quantity of materials are estimated based on the typical drawings of the proposed silviculture infrastructures.

D.3 Cost estimate

The construction cost of the silviculture infrastructures is estimated based on the typical designs mentioned above. The construction cost is composed with a) direct cost and b) indirect cost. On the other hand, the costs for the survey and detailed design work for the silviculture infrastructure is estimated at 3.5 % of the construction costs of the respective facilities.

D.3.1 Direct construction cost

The direct cost for sivilculture infrastructure is estimated in the same way as the rural infrastructure construction and improvement by the construction unit price following the construction cost norm specified in "Decree No. 32/3015/ND-CP" under "Law of Construction". According to the Decree, the construction cost norm should be established and promulgated by the PPC or branch of the Ministry of Construction considering the particular and location of the works based on the Econo-Technical Norm and Construction Price Index issued by the Ministry of Construction. The Unit Construction Cost is composed of price of construction material, construction machinery and construction labor and the Decree guides the way of determination of each price. According to the Decree, the material cost should be determined on the basis of the market price notified by the suppliers and transportation cost of the material to the work site should be added to the price. The construction labor price is guided to be determined according to the popular labor market price in each region or Province. The machine and equipment price are determined by the guidance of the Ministry of Construction with monthly and quarterly hiring charges.

Although the way of establishment of construction unit price is varied in each Province for each type of work, the unit construction price for short listed rural infrastructure construction and improvement for each province is calculated based on collected Provincial norms[1]. In addition, for the infrastructure which is peculiar to silviculture such as firebreak line, nursery, the norms provided by the DRAD of each Province were used in case of no work quantities or price were determined in the general civil construction norms.

[1] Construction cost norm in Dien Bien Province: 23/5/2016, in Lai Chau Province: 30/4/2016, Son La Province : 11/1/2016, and in Hoa Binh Province: 10/5/2016.

D.3.2 Indirect construction cost

The following administrative charges of the Contractor and their profit are estimated and included in the direct construction cost based on Circular No. 06/2016/TT-BXD. Any price and physical contingencies are not included in the cost estimation.

i) Administration Charge: 6.5 % of Direct Cost for fire watching tower and forest guard station, 5.5% for motorbike road, and 5.0 % for nursery and information board

ii) Profit: 6.0 % for motorbike road, 5.5 % for fire watching tower, forest guard station, nursery, and information board

D.3.3 Unit cost of construction

The work quantities of each subcomponents are tentatively estimated considering the similar type of work carried out in Government projects in the target provinces or JICA2 implementation works and based on the typical design.

Based on the above cost estimation methodology, the unit construction costs of silviculture infrastructures are estimated and summarized below. Each unit cost of silvicuture infrastructure in each Province are shown in **Tables D-1 to D-7**, and summarized below.

Estimated Unit Cost for Silviculture Infrastructure (Construction Cost) (without VAT)

Item	Dien Bien	Lai Chau	Son La	Hoa Binh	(Unit)
Motorbike road	657,116,215	654,256,502	648,433,356	632,645,695	VND/km
Foot path	65,711,622	65,425,650	64,843,336	63,264,570	VND/km
Fire breakline	45,966,864	45,966,864	45,966,864	45,966,864	VND/km
Fire watch tower	166,652,448	167,449,892	167,960,872	164,740,149	VND/nos
FMB office	803,309,342	780,073,172	772,938,944	719,166,668	VND/nos
Forest guard station	401,654,671	390,036,586	386,469,472	359,583,334	VND/nos
Infromation Board	24,408,561	24,592,888	24,979,423	22,797,626	VND/nos
Nursery	312,899,497	323,934,070	319,633,090	293,719,350	VND/nos

Source: JICA preparatory survey team (2016)

D.4 Estimated Cost of the Component by Province

D.4.1 Construction Cost

Based on the work quantity and unit cost for silviculture infrastructure construction, the total cost for each Province is estimated as shown below.

Total Construction Cost for Silviculture Infrastructure Development in the Four Provinces

Unit: '000,000 VND

Province	District	Management Body	Motorbike/Forestry Road	Foot path	Fire Breakline	Fire watch tower	FMB Office	Forest Guard Station	Information board	Nursery	Total
Dien Bien	Dien Bien	Dien Bien PFMB	8,244	0	1,170	0	**0**	730	67	0	10,211
		Muong Phang SUFMB	0	0	0	0	0	1,461	0	0	1,461
	Muong Cha	Muong Cha PFMB	0	0	669	0	0	730	67	284	1,750
		Muong Cha PFMB (Unallocated)	12,306	0	0	0	0	1,095	0	0	13,401
	Tuan Giao	Tuan Giao PFMB	8,124	0	669	606	0	1,095	89	0	10,583
	Total		**28,674**	**0**	**2,508**	**606**	**0**	**5,111**	**223**	**284**	**37,406**
Lai Chau	Sin Ho	Nam Ma PFMB	7,137	0	1,128	609	0	709	157	0	9,740
		Nam Na PFMB	7,137	0	1,254	304	0	709	45	267	9,716
	Than Uyen	Than Uyen PFMB	7,137	0	1,504	457	0	355	45	267	9,765
	Tan Uyen	Tan Uyen PFMB	7,137	0	878	304	0	1,064	67	534	9,984
	Total		**28,548**	**0**	**4,764**	**1,674**	**0**	**2,837**	**314**	**1,068**	**39,205**
Son La	Thuan Chau	Copia SUFMB	1,179	87	460	458	703	709	204	0	3,800
		Thuan Chau PFMB	6,779	0	1,254	458	0	355	0	872	9,718
	Moc Chau Van Ho	Xuan Nha SUFMB	0	261	0	305	0	355	91	0	1,012
	Quynh Nhai	Quynh Nhai PFMB	0	87	293	305	0	355	91	0	1,131
	Total		**7,958**	**435**	**2,007**	**1,526**	**703**	**1,774**	**386**	**872**	**15,661**
Hoa Binh	Da Bac	Phu Canh SUFMB	0	0	460	150	0	654	0	267	1,531
	Da Bac and others	Da river PFMB	6,902	0	1,504	0	0	327	228	267	9,228
	Lac son Tan Lac	Ngoc Son - Ngo Luong SUFMB	0	0	376	150	0	654	124	0	1,304
	Mai Chau	Hang Kia - Pa Co SUFMB	0	0	0	300	0	327	21	0	648
	Total		**6,902**	**0**	**2,340**	**600**	**0**	**1,962**	**373**	**534**	**12,711**
Overall			**72,082**	**435**	**11,619**	**4,406**	**703**	**11,684**	**1,296**	**2,758**	**104,983**

Source: JICA preparatory survey team (2016)

D.4.2 Design Cost

The total detailed design cost is estimated at VND 3,966.4 million for all the silviculture infrastructure facilities proposed in the four provinces. The costs for the detailed design works in the respective provinces are summarized below.

Total Costs for Survey and Detailed Design Works in the Four Provinces

(unit: VND million)

Items	Dien Bien	Lai Chau	Son La	Hoa Binh	Total
Motorbike/Forestry Road	1,104.0	1,099.2	306.4	265.7	2,775.2
Foot path	0.0	0.0	15.2	0.0	15.2
Firebreak line	87.8	166.7	70.2	81.9	406.6
Fire watch tower	21.2	58.6	53.4	21.0	154.2
FMB office	0.0	0.0	24.6	0.0	24.6
Forest guard station	178.9	99.3	61.5	68.6	408.3
Information board	7.8	11.0	13.5	19.6	51.8
Nursery	10.0	41.2	30.5	18.7	100.4
Total	**1,409.6**	**1,476.0**	**575.4**	**475.5**	**3,936.4**

Tables

Table D-1 Typical Cost Estimation for Construction of Silviculture Infrastructure: Forestry Road

Type of Infrastructure: Forestry Road
Province: Dien Dien

No	Code	Description	Unit	Quantity	Unit Price (VND)	Amount (VND)
I		Earth works and Road Form				
1	AB.31132	Diging road by exvacator <= 1.25 m3, bulldozer <= 110 CV, then pouring onto truck, soil level II	100m3	0.5828	2,476,868	1,443,519
2	AB.31133	Diging road by exvacator <= 1.25 m3, bulldozer <= 110 CV, then pouring onto truck, soil level III	100m3	3.7620	2,917,598	10,976,004
3	AB.22123	Digging ground, distance <= 50 m by bulldozer <= 110 CV, soil level	100m3	33.8592	1,155,732	39,132,161
4	AB.31134	Diging road by exvacator <= 1.25 m3, bulldozer <= 110 CV, then pouring onto truck, soil level IV	100m3	1.1552	3,638,192	4,202,839
5	AB.22124	Digging ground, distance <= 50 m by bulldozer <= 110 CV, soil level	100m3	10.3968	1,559,428	16,213,061
6	AB.11823	Digging road pattern, drainage, fishbone trench, depth <= 30 cm, soil level III	m3	39.1872	327,655	12,839,882
7	AB.24113	Digging ground using excavator <= 0.4 m3 and bulldozer <= 110 CV, soil level III	100m3	1.6804	1,557,753	2,617,648
8	AB.32123	Digging the new road by bulldozer <= 110 CV, distance <= 50 m, soil level III	100m3	1.8464	2,703,656	4,992,030
II		Surface				
9	AD.22311	Make face of street with granulometry stone 0-4mm, thickness of pressured street face 10cm	100m2	2.5000	4,079,440	10,198,600
10	AB.62112	Leveling land by concretevibrator 9 tons, tight requirement K = 0.90	100m3	7.0592	846,579	5,976,170
III		Culvert				
11	AB.11323	Digging foundation buttress, wide <= 3 m, depth <= 2 m, soil level III	m3	40.5000	337,976	13,688,028
12	AB.13411	Embanking foundation with sand	m3	1.9800	585,209	1,158,714
13	AE.11114	Build rubble, build foundation, thickness <=60 cm, cement mortar mark 75	m3	12.5400	1,458,877	18,294,318
14	AG.11613	Produce precast concrete structure, buy pipe concrete, diameter <= 70 cm, stone 1x2, mark 200	m3	1.1400	2,173,525	2,477,819
15	AG.42111	Install precast concrete components, install precast concrete components manually, weight <=50kg	cái	12.0000	48,288	579,456
16	AB.13113	Embanking foundation, tight requirement of K = 0.95	m3	13.5000	180,597	2,438,060
Total						147,228,309
Round Total						147,228,000

Table D-1 Typical Cost Estimation for Construction of Silviculture Infrastructure: Forestry Road

Type of Infrastructure: Forestry Road
Province: Lai Chau

No	Code	Description	Unit	Quantity	Unit Price (VND)	Amount (VND)
I		Earth works and Road Form				
1	AB.31132	Diging road by exvacator <= 1.25 m3, bulldozer <= 110 CV, then pouring onto truck, soil level II	100m3	0.5828	2,392,986	1,394,632
2	AB.31133	Diging road by exvacator <= 1.25 m3, bulldozer <= 110 CV, then pouring onto truck, soil level III	100m3	3.7620	2,820,165	10,609,461
3	AB.22123	Digging ground, distance <= 50 m by bulldozer <= 110 CV, soil level	100m3	33.8592	1,065,941	36,091,910
4	AB.31134	Diging road by exvacator <= 1.25 m3, bulldozer <= 110 CV, then pouring onto truck, soil level IV	100m3	1.1552	3,508,225	4,052,702
5	AB.22124	Digging ground, distance <= 50 m by bulldozer <= 110 CV, soil level	100m3	10.3968	1,438,275	14,953,458
6	AB.11823	Digging road pattern, drainage, fishbone trench, depth <= 30 cm, soil level III	m3	39.1872	327,655	12,839,882
7	AB.24113	Digging ground using excavator <= 0.4 m3 and bulldozer <= 110 CV, soil level III	100m3	1.6804	1,458,391	2,450,680
8	AB.32123	Digging the new road by bulldozer <= 110 CV, distance <= 50 m, soil level III	100m3	1.8464	2,591,822	4,785,540
II		Surface				
9	AD.22311	Make face of street with granulometry stone 0-4mm, thickness of pressured street face 10cm	100m2	2.5000	7,111,506	17,778,765
10	AB.62112	Leveling land by concretevibrator 9 tons, tight requirement K = 0.90	100m3	7.0592	845,356	5,967,537
III		Culvert				
11	AB.11323	Digging foundation buttress, wide <= 3 m, depth <= 2 m, soil level III	m3	40.5000	337,976	13,688,028
12	AB.13411S	Embanking foundation with sand	m3	1.9800	695,055	1,376,209
13	AE.11114	Build rubble, build foundation, thickness <=60 cm, cement mortar mark 75	m3	12.5400	1,599,502	20,057,755
14	AG.11613	Produce precast concrete structure, buy pipe concrete, diameter <= 70 cm, stone 1x2, mark 200	m3	1.1400	2,404,447	2,741,070
15	AG.42111	Install precast concrete components, install precast concrete components manually, weight <=50kg	nos	12.0000	49,518	594,216
16	AB.13113	Embanking foundation, tight requirement of K = 0.95	m3	13.5000	180,598	2,438,073
Total						151,819,918
Round total						151,820,000

Table D-1 Typical Cost Estimation for Construction of Silviculture Infrastructure: Forestry Road

Type of Infrastructure: Forestry Road
Province: Son La

No	Code	Description	Unit	Quantity	Unit Price (VND)	Amount (VND)
I		Earth works and Road Form				
1	AB.31132	Diging road by exvacator <= 1.25 m3, bulldozer <= 110 CV, then pouring onto truck, soil level II	100m3	0.5828	2,497,842	1,455,742
2	AB.31133	Diging road by exvacator <= 1.25 m3, bulldozer <= 110 CV, then pouring onto truck, soil level III	100m3	3.7620	2,941,979	11,067,725
3	AB.22123	Digging ground, distance <= 50 m by bulldozer <= 110 CV, soil level	100m3	33.8592	1,164,070	39,414,479
4	AB.31134	Diging road by exvacator <= 1.25 m3, bulldozer <= 110 CV, then pouring onto truck, soil level IV	100m3	1.1552	3,671,190	4,240,959
5	AB.22124	Digging ground, distance <= 50 m by bulldozer <= 110 CV, soil level	100m3	10.3968	1,570,680	16,330,046
6	AB.11823	Digging road pattern, drainage, fishbone trench, depth <= 30 cm, soil level III	m3	39.1872	327,657	12,839,960
7	AB.24113	Digging ground using excavator <= 0.4 m3 and bulldozer <= 110 CV, soil level III	100m3	1.6804	1,587,131	2,667,015
8	AB.32123	Digging the new road by bulldozer <= 110 CV, distance <= 50 m, soil level III	100m3	1.8464	2,714,041	5,011,205
II		Surface				
9	AD.22311	Make face of street with granulometry stone 0-4mm, thickness of pressured street face 10cm	100m2	2.5000	7,346,823	18,367,058
10	AB.62112	Leveling land by concretevibrator 9 tons, tight requirement K = 0.90	100m3	7.0592	868,028	6,127,583
III		Culvert				
11	AB.11323	Digging foundation buttress, wide <= 3 m, depth <= 2 m, soil level III	m3	40.5000	337,976	13,688,028
12	AB.13411	Embanking foundation with sand	m3	1.9800	746,665	1,478,397
13	AE.11114	Build rubble, build foundation, thickness <=60 cm, cement mortar mark 75	m3	12.5400	1,683,187	21,107,165
14	AG.11613	Produce precast concrete structure, buy pipe concrete, diameter <= 70 cm, stone 1x2, mark 200	m3	1.1400	2,513,772	2,865,700
15	AG.42111	Install precast concrete components, install precast concrete components manually, weight <=50kg	cái	12.0000	49,539	594,468
16	AB.13113	Embanking foundation, tight requirement of K = 0.95	m3	13.5000	180,598	2,438,073
Total						159,693,603
Round Total						159,694,000

Table D-1 Typical Cost Estimation for Construction of Silviculture Infrastructure: Forestry Road

Type of Infrastructure: Forestry Road
Province: Hoa Binh

No	Code	Description	Unit	Quantity	Unit Price (VND)	Amount (VND)
I		Earth works and Road Form				
1	AB.31132	Diging road by exvacator <= 1.25 m3, bulldozer <= 110 CV, then pouring onto truck, soil level II	100m3	0.5828	2,633,645	1,534,888
2	AB.31133	Diging road by exvacator <= 1.25 m3, bulldozer <= 110 CV, then pouring onto truck, soil level III	100m3	3.7620	3,099,978	11,662,117
3	AB.22123	Digging ground, distance <= 50 m by bulldozer <= 110 CV, soil level	100m3	33.8592	1,102,049	37,314,498
4	AB.31134	Diging road by exvacator <= 1.25 m3, bulldozer <= 110 CV, then pouring onto truck, soil level IV	100m3	1.1552	3,888,909	4,492,468
5	AB.22124	Digging ground, distance <= 50 m by bulldozer <= 110 CV, soil level	100m3	10.3968	1,487,000	15,460,042
6	AB.11823	Digging road pattern, drainage, fishbone trench, depth <= 30 cm, soil level III	m3	39.1872	327,657	12,839,960
7	AB.24113	Digging ground using excavator <= 0.4 m3 and bulldozer <= 110 CV, soil level III	100m3	1.6804	1,765,504	2,966,753
8	AB.32123	Digging the new road by bulldozer <= 110 CV, distance <= 50 m, soil level III	100m3	1.8464	2,636,797	4,868,582
II		Surface				
9	AD.22311	Make face of street with granulometry stone 0-4mm, thickness of pressured street face 10cm	100m2	2.5000	2,828,274	7,070,685
10	AB.62112	Leveling land by concretevibrator 9 tons, tight requirement K = 0.90	100m3	7.0592	871,685	6,153,399
III		Culvert				
11	AB.11323	Digging foundation buttress, wide <= 3 m, depth <= 2 m, soil level III	m3	40.5000	337,976	13,688,028
12	AB.13411	Embanking foundation with sand	m3	1.9800	435,387	862,066
13	AE.11114	Build rubble, build foundation, thickness <=60 cm, cement mortar mark 75	m3	12.5400	1,210,080	15,174,403
14	AG.11613	Produce precast concrete structure, buy pipe concrete, diameter <= 70 cm, stone 1x2, mark 200	m3	1.1400	1,971,199	2,247,167
15	AG.42111	Install precast concrete components, install precast concrete components manually, weight <=50kg	Items	12.0000	47,630	571,560
16	AB.13113	Embanking foundation, tight requirement of K = 0.95	m3	13.5000	180,598	2,438,073
Tổng cộng						139,344,689
Làm tròn						139,345,000

Table D- 2 Typical Cost Estimation for Construction of Silviculture Infrastructure

Type of Infrastructure: Fire Break Line
Province: Hoa Binh, Son La, Dien Dien and Lai Chau
Specification: Clear Fire Break Line
Length: 1.0 km, Width: 10m
Quantity: 10000m2

No	Items	Formula	Symbol	Unit	Quantity	Code Norm	Norm (m^2/labour/ day)	Factor		Labour	Unit Price (VND)	Amount (VND)
								Slope	Sun Heat			
I	Carry-out Fire break lines		I	km	1							37,903,000
	Cutting tree, grass, cleaning line with 10m width			m2	10,000	160	76.9	0.92	0.90	157.1	241,269	37,903,000
	Total direct cost	I	T									37,903,000
II	GENERAL COST	T x 5%	C									1,895,150
III	INCOME BEFORE TAX	5%*(T+C)	TL									1,989,908
	Total cost before VAT	T+C+TL	G									41,788,058
IV	VAT TAX (10%)	Gx10%	GTGT									4,178,806
	Total cost after VAT	G + GTGT										45,966,864
	Round total	Gt										45,967,000

Table **D**-3 Typical Cost Estimation For Construction of Silviculture Infrastructure:Fire Watch Tower

Type of Infrastructure: Fire Watch Tower

Province: Dien Dien

No	Code	Description	Unit	Quantity	Unit Price (VND)	Amount (VND)
1	AB.11324	Digging foundation buttress, wide <= 3 m, depth <= 2 m, soil level IV	m3	21.114	518,427.	10,946,067.7
2	AB.11314	Digging foundation buttress, wide <= 3 m, depth <= 1 m, soil level IV	m3	1.	500,282.	500,282.
3	AF.15512	Broken brick concrete mark 50	m3	1.624	987,802.	1,604,190.4
4	AF.81122	Framework for at-spot concrete, timber framework, square and rectangle column foundation framework	100m2	1.433	14,350,747.	20,564,620.5
5	AF.61110	Produce and install steel reinforced concrete at spot, steel reinforced foundation, diameter <= 10 mm	Tons	0.089	18,458,782.	1,642,831.6
6	AF.61120	Produce and install steel reinforced concrete at spot, steel reinforced foundation, diameter <= 18 mm	Tons	0.068	18,461,519.	1,255,383.3
7	AF.11233	Concrete produced by mixer, cast manually, foundation concrete, stone 2x4, width <=250cm, mark 200	m3	3.51	1,908,797.	6,699,877.5
8	AF.81122	Framework for at-spot concrete, timber framework, square and rectangle column foundation framework	100m2	0.056	14,350,747.	803,641.8
9	AF.12213	Concrete produced by mixer, cast manually, column concrete, stone 1x2, column section <=0,1m2, height <=4m, mark 200	m3	0.48	2,897,002.	1,390,561.
10	AF.81141	Framework for at-spot concrete, timber framework, beam, tie framework	100m2	0.06	18,856,562.	1,131,393.7
11	AF.61511	Produce and install steel reinforced concrete at spot, steel reinforced beam, tie, diameter <=10 mm, height <=4m	Tons	0.01	19,816,476.	198,164.8
12	AF.61521	Produce and install steel reinforced concrete at spot, steel reinforced beam, tie, diameter <=18 mm, height <=4m	Tons	0.065	18,941,766.	1,231,214.8
13	AF.12313	Concrete produced by mixer, cast manually, beam concrete, house tie, stone 1x2, mark 200	m3	0.6	2,600,717.	1,560,430.2
14	AE.81413	Build Concrete Block wall 15x20x30, Wall thickness <=30 cm, Mortar mark 50	m3	0.81	941,140.	762,323.4
15	AB.13112	Embanking foundation, tight requirement of K = 0.90	m3	17.143	173,674.	2,977,293.4
16	AF.15513	Broken brick concrete mark 75	m3	1.6	1,071,488.	1,714,380.8
17	AF.61411	Produce and install steel reinforced concrete at spot, steel reinforced column, post, diameter <=10 mm, column and post height <=4m	Tons	0.006	19,449,231.	116,695.4
18	AF.61421	Produce and install steel reinforced concrete at spot, steel reinforced column, post, diameter <=1 mm, column and post height <=4m	Tons	0.203	18,951,198.	3,847,093.2
19	AF.81122	Framework for at-spot concrete, timber framework, square and rectangle column foundation framework	100m2	0.134	14,350,747.	1,923,000.1
20	AF.12213	Concrete produced by mixer, cast manually, column concrete, stone 1x2, column section <=0,1m2, height <=4m, mark 200	m3	0.804	2,897,002.	2,329,189.6
21	AF.81141	Framework for at-spot concrete, timber framework, beam, tie framework	100m2	0.096	18,856,562.	1,810,230.
22	AF.81151	Framework for at-spot concrete, timber framework, floor, roof framework	100m2	0.078	14,928,456.	1,164,419.6
23	AF.61511	Produce and install steel reinforced concrete at spot, steel reinforced beam, tie, diameter <=10 mm, height <=4m	Tons	0.017	19,816,476.	336,880.1
24	AF.61421	Produce and install steel reinforced concrete at spot, steel reinforced column, post, diameter <=1 mm, column and post height <=4m	Tons	0.065	18,951,198.	1,231,827.9
25	AF.61711	Produce and install steel reinforced concrete at spot, steel reinforced camp ceiling, height <=16m, diameter <=10 mm	Tons	0.057	19,382,086.	1,104,778.9
26	AF.12313	Concrete produced by mixer, cast manually, beam concrete, house tie, stone 1x2, mark 200	m3	0.72	2,600,717.	1,872,516.2
27	AF.12413	Concrete produced by mixer, cast manually, camp ceiling concrete, stone 1x2, mark 200	m3	0.784	2,273,126.	1,782,130.8

No	Code	Description	Unit	Quantity	Unit Price (VND)	Amount (VND)
28	AF.61412	Produce and install steel reinforced concrete at spot, steel reinforced column, post, diameter <=10 mm, column and post height <=16m	Tons	0.087	19,577,293.	1,703,224.5
29	AF.61422	Produce and install steel reinforced concrete at spot, steel reinforced column, post, diameter <=18 mm, column and post height <=16m	Tons	0.2	19,030,498.	3,806,099.6
30	AF.81132	Framework for at-spot concrete, timber framework, square, rectangle column framework	100m2	0.348	15,996,320.	5,566,719.4
31	AF.12223	Concrete produced by mixer, cast manually, column concrete, stone 1x2, column section <=0,1m2, height <=16m, mark 200	m3	2.088	3,039,768.	6,347,035.6
32	AF.81141	Framework for at-spot concrete, timber framework, beam, tie framework	100m2	0.175	18,856,562.	3,299,898.4
33	AF.81151	Framework for at-spot concrete, timber framework, floor, roof framework	100m2	0.144	14,928,456.	2,149,697.7
34	AF.61512	Produce and install steel reinforced concrete at spot, steel reinforced beam, tie, diameter <=10 mm, height <=16m	Tons	0.056	19,941,756.	1,116,738.3
35	AF.61522	Produce and install steel reinforced concrete at spot, steel reinforced beam, tie, diameter <=18 mm, height <=16m	Tons	0.11	19,076,474.	2,098,412.1
36	AF.61711	Produce and install steel reinforced concrete at spot, steel reinforced camp ceiling, height <=16m, diameter <=10 mm	Tons	0.062	19,382,086.	1,201,689.3
37	AF.12313	Concrete produced by mixer, cast manually, beam concrete, house tie, stone 1x2, mark 200	m3	1.436	2,600,717.	3,734,629.6
38	AF.12413	Concrete produced by mixer, cast manually, camp ceiling concrete, stone 1x2, mark 200	m3	0.916	2,273,126.	2,082,183.4
39	AE.32124	Build Brick wall 5x10x20, wall thickness <=10 cm, high <=16 m, mortar mark 75	m3	0.209	2,651,481.	554,159.5
40	AK.82220	Cover by cement to column, beam, ceiling	m2	11.162	145,923.	1,628,792.5
41	AK.41214	Glaze colored base, floor, thickness 2,0 cm, cement mortar mark 75	m2	16.	61,063.	977,008.
42	AK.41124	Glaze colorless base, floor, thickness 3,0 cm, cement mortar mark 75	m2	14.122	78,185.	1,104,128.6
43	AK.22124	Plaster pole,column, stairs, thickness 1,5 cm, cement mortar mark 75	m2	43.2	175,854.	7,596,892.8
44	AK.23114	Plaster beam, cement mortar mark 75	m2	27.1	125,327.	3,396,361.7
45	AK.23214	Plaster ceiling, cement mortar mark 75	m2	22.2	169,909.	3,771,979.8
46	TT	Round steel bar D14 for handrail	kg	122.767	17,551.	2,154,683.6
47	AI.11531	Produce iron lattice barrier	1m2	19.912	862,224.	17,168,604.3
48	AK.83422	Paint kinds of iron, steel with 3 layers	m2	39.824	60,121.	2,394,258.7
49	TT	Steel bar D20 for steel ladder	kg	160.056	17,551.	2,809,142.9
50	TT	Shape steel L70x70x6 for steel ladder	kg	124.938	18,910.	2,362,577.6
51	TT	Bolt to connect steel ladder with concrete beam	cái	18.	20,393.	367,074.
52	AI.11411	Produce iron ladder	Tons	0.285	31,424,032.	8,955,849.1
53	AK.83422	Paint kinds of iron, steel with 3 layers	m2	28.282	60,121.	1,700,342.1
54	AK.81120	Scan lime with 1 white layer and 2 colored layers outside house	m2	92.5	12,497.	1,155,972.5
55	TT	Metal sheet 2mm thickness to make ladder door	kg	24.296	18,910.	459,437.4
56	AL.61210	Install construction steel scaffold, inside scaffold, standard height 3,6m	100m2	1.512	1,645,130.	2,487,436.6
TOTAL						**166,652,448**
ROUND TOTAL						**166,652,000**

Table **D**-3 Typical Cost Estimation For Construction of Silviculture Infrastructure:Fire Watch Tower

Type of Infrastructure: Fire Watch Tower

Province : Lai Chau

No	Code	Description	Unit	Quantity	Unit Price (VND)	Amount (VND)
1	AB.11324	Digging foundation buttress, wide <= 3 m, depth <= 2 m, soil level IV	m3	21.114	518,427.	10,946,067.7
2	AB.11314	Digging foundation buttress, wide <= 3 m, depth <= 1 m, soil level IV	m3	1.	500,282.	500,282.
3	AF.15512	Broken brick concrete mark 50	m3	1.624	892,496.	1,449,413.5
4	AF.81122	Framework for at-spot concrete, timber framework, square and rectangle column foundation framework	100m2	1.433	13,898,403.	19,916,411.5
5	AF.61110	Produce and install steel reinforced concrete at spot, steel reinforced foundation, diameter <= 10 mm	Tons	0.089	19,570,229.	1,741,750.4
6	AF.61120	Produce and install steel reinforced concrete at spot, steel reinforced foundation, diameter <= 18 mm	Tons	0.068	19,370,072.	1,317,164.9
7	AF.11233	Concrete produced by mixer, cast manually, foundation concrete, stone 2x4, width <=250cm, mark 200	m3	3.51	2,192,049.	7,694,092.
8	AF.81122	Framework for at-spot concrete, timber framework, square and rectangle column foundation framework	100m2	0.056	13,898,403.	778,310.6
9	AF.12213	Concrete produced by mixer, cast manually, column concrete, stone 1x2, column section <=0,1m2, height <=4m, mark 200	m3	0.48	3,180,722.	1,526,746.6
10	AF.81141	Framework for at-spot concrete, timber framework, beam, tie framework	100m2	0.06	18,199,477.	1,091,968.6
11	AF.61511	Produce and install steel reinforced concrete at spot, steel reinforced beam, tie, diameter <=10 mm, height <=4m	Tons	0.01	20,927,921.	209,279.2
12	AF.61521	Produce and install steel reinforced concrete at spot, steel reinforced beam, tie, diameter <=18 mm, height <=4m	Tons	0.065	19,850,328.	1,290,271.3
13	AF.12313	Concrete produced by mixer, cast manually, beam concrete, house tie, stone 1x2, mark 200	m3	0.6	2,891,975.	1,735,185.
14	AE.81413	Build Concrete Block wall 15x20x30, Wall thickness <=30 cm, Mortar mark 50	m3	0.81	1,383,436.	1,120,583.2
15	AB.13112	Embanking foundation, tight requirement of K = 0.90	m3	17.143	173,674.	2,977,293.4
16	AF.15513	Broken brick concrete mark 75	m3	1.6	1,014,643.	1,623,428.8
17	AF.61411	Produce and install steel reinforced concrete at spot, steel reinforced column, post, diameter <=10 mm, column and post height <=4m	Tons	0.006	20,560,676.	123,364.1
18	AF.61421	Produce and install steel reinforced concrete at spot, steel reinforced column, post, diameter <=1 mm, column and post height <=4m	Tons	0.203	19,859,783.	4,031,535.9
19	AF.81122	Framework for at-spot concrete, timber framework, square and rectangle column foundation framework	100m2	0.134	13,898,403.	1,862,386.
20	AF.12213	Concrete produced by mixer, cast manually, column concrete, stone 1x2, column section <=0,1m2, height <=4m, mark 200	m3	0.804	3,180,722.	2,557,300.5
21	AF.81141	Framework for at-spot concrete, timber framework, beam, tie framework	100m2	0.096	18,199,477.	1,747,149.8
22	AF.81151	Framework for at-spot concrete, timber framework, floor, roof framework	100m2	0.078	14,394,798.	1,122,794.2
23	AF.61511	Produce and install steel reinforced concrete at spot, steel reinforced beam, tie, diameter <=10 mm, height <=4m	Tons	0.017	20,927,921.	355,774.7
24	AF.61421	Produce and install steel reinforced concrete at spot, steel reinforced column, post, diameter <=1 mm, column and post height <=4m	Tons	0.065	19,859,783.	1,290,885.9

No	Code	Description	Unit	Quantity	Unit Price (VND)	Amount (VND)
25	AF.61711	Produce and install steel reinforced concrete at spot, steel reinforced camp ceiling, height <=16m, diameter <=10	Tons	0.057	20,493,531.	1,168,131.3
26	AF.12313	Concrete produced by mixer, cast manually, beam concrete, house tie, stone 1x2, mark 200	m3	0.72	2,891,975.	2,082,222.
27	AF.12413	Concrete produced by mixer, cast manually, camp ceiling concrete, stone 1x2, mark 200	m3	0.784	2,564,384.	2,010,477.1
28	AF.61412	Produce and install steel reinforced concrete at spot, steel reinforced column, post, diameter <=10 mm, column and post height <=16m	Tons	0.087	20,688,740.	1,799,920.4
29	AF.61422	Produce and install steel reinforced concrete at spot, steel reinforced column, post, diameter <=18 mm, column and post height <=16m	Tons	0.2	19,939,084.	3,987,816.8
30	AF.81132	Framework for at-spot concrete, timber framework, square, rectangle column framework	100m2	0.348	15,509,931.	5,397,456.
31	AF.12223	Concrete produced by mixer, cast manually, column concrete, stone 1x2, column section <=0,1m2, height <=16m, mark 200	m3	2.088	3,323,487.	6,939,440.9
32	AF.81141	Framework for at-spot concrete, timber framework, beam, tie framework	100m2	0.175	18,199,477.	3,184,908.5
33	AF.81151	Framework for at-spot concrete, timber framework, floor, roof framework	100m2	0.144	14,394,798.	2,072,850.9
34	AF.61512	Produce and install steel reinforced concrete at spot, steel reinforced beam, tie, diameter <=10 mm, height <=16m	Tons	0.056	21,053,201.	1,178,979.3
35	AF.61522	Produce and install steel reinforced concrete at spot, steel reinforced beam, tie, diameter <=18 mm, height <=16m	Tons	0.11	19,985,037.	2,198,354.1
36	AF.61711	Produce and install steel reinforced concrete at spot, steel reinforced camp ceiling, height <=16m, diameter <=10 mm	Tons	0.062	20,493,531.	1,270,598.9
37	AF.12313	Concrete produced by mixer, cast manually, beam concrete, house tie, stone 1x2, mark 200	m3	1.436	2,891,975.	4,152,876.1
38	AF.12413	Concrete produced by mixer, cast manually, camp ceiling concrete, stone 1x2, mark 200	m3	0.916	2,564,384.	2,348,975.7
39	AE.32124	Build Brick wall 5x10x20, wall thickness <=10 cm, high <=16 m, mortar mark 75	m3	0.209	3,189,792.	666,666.5
40	AK.82220	Cover by cement to column, beam, ceiling	m2	11.162	44,649.	498,372.1
41	AK.41214	Glaze colored base, floor, thickness 2,0 cm, cement mortar mark 75	m2	16.	63,534.	1,016,544.
42	AK.41124	Glaze colorless base, floor, thickness 3,0 cm, cement mortar mark 75	m2	14.122	81,530.	1,151,366.7
43	AK.22124	Plaster pole,column, stairs, thickness 1,5 cm, cement mortar mark 75	m2	43.2	181,804.	7,853,932.8
44	AK.23114	Plaster beam, cement mortar mark 75	m2	27.1	131,276.	3,557,579.6
45	AK.23214	Plaster ceiling, cement mortar mark 75	m2	22.2	175,859.	3,904,069.8
46	TT	Round steel bar D14 for handrail	kg	122.767	17,551.	2,154,683.6
47	AI.11531	Produce iron lattice barrier	1m2	19.912	874,885.	17,420,710.1
48	AK.83422	Paint kinds of iron, steel with 3 layers	m2	39.824	42,984.	1,711,794.8
49	TT	Steel bar D20 for steel ladder	kg	160.056	17,551.	2,809,142.9
50	TT	Shape steel L70x70x6 for steel ladder	kg	124.938	18,910.	2,362,577.6
51	TT	Bolt to connect steel ladder with concrete beam	cái	18.	20,393.	367,074.
52	AI.11411	Produce iron ladder	Tons	0.285	31,075,915.	8,856,635.8
53	AK.83422	Paint kinds of iron, steel with 3 layers	m2	28.282	42,984.	1,215,673.5
54	AK.81120	Scan lime with 1 white layer and 2 colored layers outside house	m2	92.5	3,864.	357,420.
55	TT	Metal sheet 2mm thickness to make ladder door	kg	24.296	18,910.	459,437.4
56	AL.61210	Install construction steel scaffold, inside scaffold, standard height 3,6m	100m2	1.512	1,510,425.	2,283,762.6
TOTAL						**167,449,892**
ROUND TOTAL						**167,450,000**

Table **D**-3 Typical Cost Estimation For Construction of Silviculture Infrastructure: Fire Watch Tower

Type of Infrastructure: Fire Watch Tower

Province: Son La

No	Code	Description	Unit	Quantity	Unit Price (VND)	Amount (VND)
1	AB.11324	Digging foundation buttress, wide <= 3 m, depth <= 2 m, soil level IV	m3	21.114	518,427.	10,946,067.7
2	AB.11314	Digging foundation buttress, wide <= 3 m, depth <= 1 m, soil level IV	m3	1.	500,282.	500,282.
3	AF.15512	Broken brick concrete mark 50	m3	1.624	1,038,068.	1,685,822.4
4	AF.81122	Framework for at-spot concrete, timber framework, square and rectangle column foundation framework	100m2	1.433	13,435,366.	19,252,879.5
5	AF.61110	Produce and install steel reinforced concrete at spot, steel reinforced foundation, diameter <= 10 mm	Tons	0.089	19,619,849.	1,746,166.6
6	AF.61120	Produce and install steel reinforced concrete at spot, steel reinforced foundation, diameter <= 18 mm	Tons	0.068	19,443,544.	1,322,161.
7	AF.11233	Concrete produced by mixer, cast manually, foundation concrete, stone 2x4, width <=250cm, mark 200	m3	3.51	2,158,892.	7,577,710.9
8	AF.81122	Framework for at-spot concrete, timber framework, square and rectangle column foundation framework	100m2	0.056	13,435,366.	752,380.5
9	AF.12213	Concrete produced by mixer, cast manually, column concrete, stone 1x2, column section <=0,1m2, height <=4m, mark 200	m3	0.48	3,129,653.	1,502,233.4
10	AF.81141	Framework for at-spot concrete, timber framework, beam, tie framework	100m2	0.06	17,532,207.	1,051,932.4
11	AF.61511	Produce and install steel reinforced concrete at spot, steel reinforced beam, tie, diameter <=10 mm, height <=4m	Tons	0.01	20,977,541.	209,775.4
12	AF.61521	Produce and install steel reinforced concrete at spot, steel reinforced beam, tie, diameter <=18 mm, height <=4m	Tons	0.065	19,923,622.	1,295,035.4
13	AF.12313	Concrete produced by mixer, cast manually, beam concrete, house tie, stone 1x2, mark 200	m3	0.6	2,847,002.	1,708,201.2
14	AE.81413	Build Concrete Block wall 15x20x30, Wall thickness <=30 cm, Mortar mark 50	m3	0.81	1,034,999.	838,349.2
15	AB.13112	Embanking foundation, tight requirement of K = 0.90	m3	17.143	173,674.	2,977,293.4
16	AF.15513	Broken brick concrete mark 75	m3	1.6	1,142,074.	1,827,318.4
17	AF.61411	Produce and install steel reinforced concrete at spot, steel reinforced column, post, diameter <=10 mm, column and post height <=4m	Tons	0.006	20,610,296.	123,661.8
18	AF.61421	Produce and install steel reinforced concrete at spot, steel reinforced column, post, diameter <=1 mm, column and post height <=4m	Tons	0.203	19,932,717.	4,046,341.6
19	AF.81122	Framework for at-spot concrete, timber framework, square and rectangle column foundation framework	100m2	0.134	13,435,366.	1,800,339.
20	AF.12213	Concrete produced by mixer, cast manually, column concrete, stone 1x2, column section <=0,1m2, height <=4m, mark 200	m3	0.804	3,129,653.	2,516,241.
21	AF.81141	Framework for at-spot concrete, timber framework, beam, tie framework	100m2	0.096	17,532,207.	1,683,091.9
22	AF.81151	Framework for at-spot concrete, timber framework, floor, roof framework	100m2	0.078	13,855,401.	1,080,721.3
23	AF.61511	Produce and install steel reinforced concrete at spot, steel reinforced beam, tie, diameter <=10 mm, height <=4m	Tons	0.017	20,977,541.	356,618.2
24	AF.61421	Produce and install steel reinforced concrete at spot, steel reinforced column, post, diameter <=1 mm, column and post height <=4m	Tons	0.065	19,932,717.	1,295,626.6
25	AF.61711	Produce and install steel reinforced concrete at spot, steel reinforced camp ceiling, height <=16m, diameter <=10 mm	Tons	0.057	20,543,151.	1,170,959.6
26	AF.12313	Concrete produced by mixer, cast manually, beam concrete, house tie, stone 1x2, mark 200	m3	0.72	2,847,002.	2,049,841.4
27	AF.12413	Concrete produced by mixer, cast manually, camp ceiling concrete, stone 1x2, mark 200	m3	0.784	2,519,411.	1,975,218.2

No	Code	Description	Unit	Quantity	Unit Price (VND)	Amount (VND)
28	AF.61412	Produce and install steel reinforced concrete at spot, steel reinforced column, post, diameter <=10 mm, column and post height <=16m	Tons	0.087	20,738,358.	1,804,237.1
29	AF.61422	Produce and install steel reinforced concrete at spot, steel reinforced column, post, diameter <=18 mm, column and post height <=16m	Tons	0.2	20,012,018.	4,002,403.6
30	AF.81132	Framework for at-spot concrete, timber framework, square, rectangle column framework	100m2	0.348	15,012,850.	5,224,471.8
31	AF.12223	Concrete produced by mixer, cast manually, column concrete, stone 1x2, column section <=0,1m2, height <=16m, mark 200	m3	2.088	3,272,420.	6,832,813.
32	AF.81141	Framework for at-spot concrete, timber framework, beam, tie framework	100m2	0.175	17,532,207.	3,068,136.2
33	AF.81151	Framework for at-spot concrete, timber framework, floor, roof framework	100m2	0.144	13,855,401.	1,995,177.7
34	AF.61512	Produce and install steel reinforced concrete at spot, steel reinforced beam, tie, diameter <=10 mm, height <=16m	Tons	0.056	21,102,821.	1,181,758.
35	AF.61522	Produce and install steel reinforced concrete at spot, steel reinforced beam, tie, diameter <=18 mm, height <=16m	Tons	0.11	20,058,330.	2,206,416.3
36	AF.61711	Produce and install steel reinforced concrete at spot, steel reinforced camp ceiling, height <=16m, diameter <=10 mm	Tons	0.062	20,543,151.	1,273,675.4
37	AF.12313	Concrete produced by mixer, cast manually, beam concrete, house tie, stone 1x2, mark 200	m3	1.436	2,847,002.	4,088,294.9
38	AF.12413	Concrete produced by mixer, cast manually, camp ceiling concrete, stone 1x2, mark 200	m3	0.916	2,519,411.	2,307,780.5
39	AE.32124	Build Brick wall 5x10x20, wall thickness <=10 cm, high <=16 m, mortar mark 75	m3	0.209	2,944,191.	615,335.9
40	AK.82220	Cover by cement to column, beam, ceiling	m2	11.162	44,658.	498,472.6
41	AK.41214	Glaze colored base, floor, thickness 2,0 cm, cement mortar mark 75	m2	16.	68,635.	1,098,160.
42	AK.41124	Glaze colorless base, floor, thickness 3,0 cm, cement mortar mark 75	m2	14.122	88,686.	1,252,423.7
43	AK.22124	Plaster pole,column, stairs, thickness 1,5 cm, cement mortar mark 75	m2	43.2	183,218.	7,915,017.6
44	AK.23114	Plaster beam, cement mortar mark 75	m2	27.1	132,692.	3,595,953.2
45	AK.23214	Plaster ceiling, cement mortar mark 75	m2	22.2	177,274.	3,935,482.8
46	TT	Round steel bar D14 for handrail	kg	122.767	17,551.	2,154,683.6
47	AI.11531	Produce iron lattice barrier	1m2	19.912	877,636.	17,475,488.
48	AK.83422	Paint kinds of iron, steel with 3 layers	m2	39.824	53,233.	2,119,951.
49	TT	Steel bar D20 for steel ladder	kg	160.056	17,551.	2,809,142.9
50	TT	Shape steel L70x70x6 for steel ladder	kg	124.938	18,910.	2,362,577.6
51	TT	Bolt to connect steel ladder with concrete beam	cái	18.	20,393.	367,074.
52	AI.11411	Produce iron ladder	Tons	0.285	31,399,092.	8,948,741.2
53	AK.83422	Paint kinds of iron, steel with 3 layers	m2	28.282	53,233.	1,505,535.7
54	AK.81120	Scan lime with 1 white layer and 2 colored layers outside house	m2	92.5	12,179.	1,126,557.5
55	TT	Metal sheet 2mm thickness to make ladder door	kg	24.296	18,910.	459,437.4
56	AL.61210	Install construction steel scaffold, inside scaffold, standard height 3,6m	100m2	1.512	1,616,007.	2,443,402.6
TOTAL						**167,960,872**
ROUND TOTAL						**167,961,000**

Table **D**-3 Typical Cost Estimation For Construction of Silviculture Infrastructure: Fire Watch Tower

Type of Infrastructure: Fire Watch Tower

Province: Hoa Binh

No	Code	Description	Unit	Quantity	Unit Price (VND)	Amount (VND)
1	AB.11324	Digging foundation buttress, wide <= 3 m, depth <= 2 m, soil level IV	m3	21.114	518,427.	10,946,067.7
2	AB.11314	Digging foundation buttress, wide <= 3 m, depth <= 1 m, soil level IV	m3	1.	500,282.	500,282.
3	AF.15512	Broken brick concrete mark 50	m3	1.624	869,915.	1,412,742.
4	AF.81122	Framework for at-spot concrete, timber framework, square and rectangle column foundation framework	100m2	1.433	15,429,171.	22,110,002.
5	AF.61110	Produce and install steel reinforced concrete at spot, steel reinforced foundation, diameter <= 10 mm	Tons	0.089	19,183,780.	1,707,356.4
6	AF.61120	Produce and install steel reinforced concrete at spot, steel reinforced foundation, diameter <= 18 mm	Tons	0.068	18,774,819.	1,276,687.7
7	AF.11233	Concrete produced by mixer, cast manually, foundation concrete, stone 2x4, width <=250cm, mark 200	m3	3.51	1,829,882.	6,422,885.8
8	AF.81122	Framework for at-spot concrete, timber framework, square and rectangle column foundation framework	100m2	0.056	15,429,171.	864,033.6
9	AF.12213	Concrete produced by mixer, cast manually, column concrete, stone 1x2, column section <=0,1m2, height <=4m, mark 200	m3	0.48	2,822,333.	1,354,719.8
10	AF.81141	Framework for at-spot concrete, timber framework, beam, tie framework	100m2	0.06	20,396,371.	1,223,782.3
11	AF.61511	Produce and install steel reinforced concrete at spot, steel reinforced beam, tie, diameter <=10 mm, height <=4m	Tons	0.01	20,541,473.	205,414.7
12	AF.61521	Produce and install steel reinforced concrete at spot, steel reinforced beam, tie, diameter <=18 mm, height <=4m	Tons	0.065	19,255,039.	1,251,577.5
13	AF.12313	Concrete produced by mixer, cast manually, beam concrete, house tie, stone 1x2, mark 200	m3	0.6	2,511,037.	1,506,622.2
14	AE.81413	Build Concrete Block wall 15x20x30, Wall thickness <=30 cm, Mortar mark 50	m3	0.81	1,082,830.	877,092.3
15	AB.13112	Embanking foundation, tight requirement of K = 0.90	m3	17.143	173,674.	2,977,293.4
16	AF.15513	Broken brick concrete mark 75	m3	1.6	972,463.	1,555,940.8
17	AF.61411	Produce and install steel reinforced concrete at spot, steel reinforced column, post, diameter <=10 mm, column and post height <=4m	Tons	0.006	20,174,228.	121,045.4
18	AF.61421	Produce and install steel reinforced concrete at spot, steel reinforced column, post, diameter <=1 mm, column and post height <=4m	Tons	0.203	19,264,420.	3,910,677.3
19	AF.81122	Framework for at-spot concrete, timber framework, square and rectangle column foundation framework	100m2	0.134	15,429,171.	2,067,508.9
20	AF.12213	Concrete produced by mixer, cast manually, column concrete, stone 1x2, column section <=0,1m2, height <=4m, mark 200	m3	0.804	2,822,333.	2,269,155.7
21	AF.81141	Framework for at-spot concrete, timber framework, beam, tie framework	100m2	0.096	20,396,371.	1,958,051.6
22	AF.81151	Framework for at-spot concrete, timber framework, floor, roof framework	100m2	0.078	16,179,306.	1,261,985.9
23	AF.61511	Produce and install steel reinforced concrete at spot, steel reinforced beam, tie, diameter <=10 mm, height <=4m	Tons	0.017	20,541,473.	349,205.
24	AF.61421	Produce and install steel reinforced concrete at spot, steel reinforced column, post, diameter <=1 mm, column and post height <=4m	Tons	0.065	19,264,420.	1,252,187.3
25	AF.61711	Produce and install steel reinforced concrete at spot, steel reinforced camp ceiling, height <=16m, diameter <=10	Tons	0.057	20,107,083.	1,146,103.7

No	Code	Description	Unit	Quantity	Unit Price (VND)	Amount (VND)
26	AF.12313	Concrete produced by mixer, cast manually, beam concrete, house tie, stone 1x2, mark 200	m3	0.72	2,511,037.	1,807,946.6
27	AF.12413	Concrete produced by mixer, cast manually, camp ceiling concrete, stone 1x2, mark 200	m3	0.784	2,183,446.	1,711,821.7
28	AF.61412	Produce and install steel reinforced concrete at spot, steel reinforced column, post, diameter <=10 mm, column and post height <=16m	Tons	0.087	20,302,290.	1,766,299.2
29	AF.61422	Produce and install steel reinforced concrete at spot, steel reinforced column, post, diameter <=18 mm, column and post height <=16m	Tons	0.2	19,343,720.	3,868,744.
30	AF.81132	Framework for at-spot concrete, timber framework, square, rectangle column framework	100m2	0.348	17,147,228.	5,967,235.3
31	AF.12223	Concrete produced by mixer, cast manually, column concrete, stone 1x2, column section <=0,1m2, height <=16m, mark 200	m3	2.088	2,965,098.	6,191,124.6
32	AF.81141	Framework for at-spot concrete, timber framework, beam, tie framework	100m2	0.175	20,396,371.	3,569,364.9
33	AF.81151	Framework for at-spot concrete, timber framework, floor, roof framework	100m2	0.144	16,179,306.	2,329,820.1
34	AF.61512	Produce and install steel reinforced concrete at spot, steel reinforced beam, tie, diameter <=10 mm, height <=16m	Tons	0.056	20,666,753.	1,157,338.2
35	AF.61522	Produce and install steel reinforced concrete at spot, steel reinforced beam, tie, diameter <=18 mm, height <=16m	Tons	0.11	19,389,747.	2,132,872.2
36	AF.61711	Produce and install steel reinforced concrete at spot, steel reinforced camp ceiling, height <=16m, diameter <=10 mm	Tons	0.062	20,107,083.	1,246,639.1
37	AF.12313	Concrete produced by mixer, cast manually, beam concrete, house tie, stone 1x2, mark 200	m3	1.436	2,511,037.	3,605,849.1
38	AF.12413	Concrete produced by mixer, cast manually, camp ceiling concrete, stone 1x2, mark 200	m3	0.916	2,183,446.	2,000,036.5
39	AE.32124	Build Brick wall 5x10x20, wall thickness <=10 cm, high <=16 m, mortar mark 75	m3	0.209	2,701,184.	564,547.5
40	AK.82220	Cover by cement to column, beam, ceiling	m2	11.162	49,299.	550,275.4
41	AK.41214	Glaze colored base, floor, thickness 2,0 cm, cement mortar mark 75	m2	16.	60,821.	973,136.
42	AK.41124	Glaze colorless base, floor, thickness 3,0 cm, cement mortar mark 75	m2	14.122	77,914.	1,100,301.5
43	AK.22124	Plaster pole,column, stairs, thickness 1,5 cm, cement mortar mark 75	m2	43.2	174,445.	7,536,024.
44	AK.23114	Plaster beam, cement mortar mark 75	m2	27.1	123,917.	3,358,150.7
45	AK.23214	Plaster ceiling, cement mortar mark 75	m2	22.2	168,500.	3,740,700.
46	TT	Round steel bar D14 for handrail	kg	122.767	17,551.	2,154,683.6
47	AI.11531	Produce iron lattice barrier	1m2	19.912	845,332.	16,832,250.8
48	AK.83422	Paint kinds of iron, steel with 3 layers	m2	39.824	40,016.	1,593,597.2
49	TT	Steel bar D20 for steel ladder	kg	160.056	17,551.	2,809,142.9
50	TT	Shape steel L70x70x6 for steel ladder	kg	124.938	18,910.	2,362,577.6
51	TT	Bolt to connect steel ladder with concrete beam	cái	18.	20,393.	367,074.
52	AI.11411	Produce iron ladder	Tons	0.285	28,156,187.	8,024,513.3
53	AK.83422	Paint kinds of iron, steel with 3 layers	m2	28.282	40,016.	1,131,732.5
54	AK.81120	Scan lime with 1 white layer and 2 colored layers outside house	m2	92.5	12,826.	1,186,405.
55	TT	Metal sheet 2mm thickness to make ladder door	kg	24.296	18,910.	459,437.4
56	AL.61210	Install construction steel scaffold, inside scaffold, standard height 3,6m	100m2	1.512	1,396,883.	2,112,087.1
TOTAL						**164,740,149**
ROUND TOTAL						**164,740,000**

Table **D**-4 Typical Cost Estimation for Construction of Silviculture Infrastructure: Forest Guard Station

Type of Infrastructure: Forest Guard Station

Province: Dien Dien

No	Code	Description	Unit	Quantity	Unit Price (VND)	Amount (VND)
I		Leveling works				
1	AB.11213	Digging soil for embanking or removing to waste yard or gethered ground, soil level III	m3	36.4000	202,186	7,359,570
2	AB.13112	Embanking foundation, tight requirement of K = 0.90	m3	20.0000	173,674	3,473,480
3	AB.11912	Transportation soil next 10m manually, soil level II	m3	16.4000	82,948	1,360,347
II		Construction works				
4	AB.11443	Diging foundation column, cylinder, test pit, large> 1 m, depth> 1 m, soil level III	m3	18.8600	391,412	7,382,030
5	AB.11313	Digging foundation buttress, wide <= 3 m, depth <= 1 m, soil level III	m3	2.2411	321,423	720,341
6	AF.11111	Concrete produced by mixer, cast manually, concrete lined foundation, stone 4x6, width <=250cm, mark 100	m3	2.3820	1,626,372	3,874,018
7	AF.81122	Framework for at-spot concrete, timber framework, square and rectangle column foundation framework	100m2	0.1008	14,270,685	1,438,485
8	AF.61110	Produce and install steel reinforced concrete at spot, steel reinforced foundation, diameter <= 10 mm	Tons	0.1061	18,220,769	1,933,224
9	AF.61120	Produce and install steel reinforced concrete at spot, steel reinforced foundation, diameter <= 18 mm	Tons	0.0981	18,221,880	1,787,566
10	AF.11213	Concrete produced by mixer, cast manually, foundation concrete, stone 1x2, width <=250cm, mark 200	m3	3.8377	1,995,830	7,659,397
11	AF.81132	Framework for at-spot concrete, timber framework, square, rectangle column framework	100m2	0.0936	15,910,059	1,489,182
12	AF.12213	Concrete produced by mixer, cast manually, column concrete, stone 1x2, column section <=0,1m2, height <=4m, mark 200	m3	0.5130	3,002,567	1,540,317
13	AE.81414	Build hole block (19x19x39)cm, build vertical wall, thickness <=19 cm, height <=4m, cement mortar mark 75	m3	3.4080	955,871	3,257,608
14	AF.81141	Framework for at-spot concrete, timber framework, beam, tie framework	100m2	0.2163	18,739,106	4,053,269
15	AF.61511	Produce and install steel reinforced concrete at spot, steel reinforced beam, tie, diameter <=10 mm, height <=4m	Tons	0.0580	19,578,462	1,135,551
16	AF.61521	Produce and install steel reinforced concrete at spot, steel reinforced beam, tie, diameter <=18 mm, height <=4m	Tons	0.2589	18,701,947	4,841,934
17	AF.12313	Concrete produced by mixer, cast manually, beam concrete, house tie, stone 1x2, mark 200	m3	1.5079	2,639,000	3,979,348
18	AB.13112	Embanking foundation, tight requirement of K = 0.90	m3	27.9905	173,674	4,861,222
19	AF.61411	Produce and install steel reinforced concrete at spot, steel reinforced column, post, diameter <=10 mm, column and post height <=4m	Tons	0.0418	19,211,217	803,029
20	AF.61421	Produce and install steel reinforced concrete at spot, steel reinforced column, post, diameter <=1 mm, column and post height <=4m	Tons	0.1735	18,711,009	3,246,360
21	AF.81132	Framework for at-spot concrete, timber framework, square, rectangle column framework	100m2	0.2932	15,910,059	4,664,829
22	AF.12213	Concrete produced by mixer, cast manually, column concrete, stone 1x2, column section <=0,1m2, height <=4m, mark 200	m3	1.2455	3,002,567	3,739,697
23	AE.71213	Build wall by 6-hole hollow brick (10x15x22), thickness >10 cm, height <=4m, cement mortar mark 50	m3	13.4275	1,746,505	23,451,196
24	AE.22114	Build brick (6,5x10,5x22), build vertical wall, thickness <=11 cm, height <=4m, cement mortar mark 75	m3	1.5598	2,779,976	4,336,207
25	AF.81141	Framework for at-spot concrete, timber framework, beam, tie framework	100m2	0.3421	18,739,106	6,410,648
26	AF.81151	Framework for at-spot concrete, timber framework, floor, roof framework	100m2	0.2669	14,832,517	3,958,799
27	AF.61511	Produce and install steel reinforced concrete at spot, steel reinforced beam, tie, diameter <=10 mm, height <=4m	Tons	0.0715	19,578,462	1,399,860
28	AF.61521	Produce and install steel reinforced concrete at spot, steel reinforced beam, tie, diameter <=18 mm, height <=4m	Tons	0.3764	18,701,947	7,039,413
29	AF.61711	Produce and install steel reinforced concrete at spot, steel reinforced camp ceiling, height <=16m, diameter <=10 mm	Tons	0.1541	19,144,018	2,950,093
30	AF.12313	Concrete produced by mixer, cast manually, beam concrete, house tie, stone 1x2, mark 200	m3	2.3457	2,639,000	6,190,302
31	AF.12413	Concrete produced by mixer, cast manually, camp ceiling concrete, stone 1x2, mark 200	m3	2.6800	2,312,050	6,196,294
32	AK.82210	Cover by cement to wall	m2	26.8000	122,055	3,271,074

No	Code	Description	Unit	Quantity	Unit Price (VND)	Amount (VND)
33	AF.61612	Produce and install steel reinforced concrete at spot, steel reinforced lintel closed cornice, water gutters, diameter <=10 mm, height <=16m	Tons	0.1299	21,244,120	2,759,611
34	AF.81152	Framework for at-spot concrete, timber framework, lintel framework, lintel closed cornice, water gutters, plate	100m2	0.2489	15,284,288	3,804,259
35	AF.12513	Concrete produced by mixer, cast manually, lintel concrete, lintel closed cornice, water gutters, overhang, stone 1x2, mark 200	m3	1.3503	2,679,295	3,617,852
36	AE.33114	Build column by brick 5x10x20, high <=4m, cement mortar mark 75	m3	0.5400	2,102,194	1,135,185
37	AE.32114	Build brick (5x10x20), build vertical wall, thickness <=10 cm, height <=4m, cement mortar mark 75	m3	0.2680	1,702,748	456,336
38	TB304	Zinc-coated Steel box 30x60x1,5 mm for purlin	m	85.5000	61,797	5,283,644
39	AK.83422	Paint kinds of iron, steel with 3 layers	m2	15.3900	59,698	918,752
40	AI.11221	Labour Produce steel purlin	Tons	0.1510	2,827,529	426,957
41	AI.61131	Install steel purlin	Tons	0.1510	2,931,959	442,726
42	AK.12222	Roofing to cover wall by corrugated iron, at any length	100m2	0.6825	25,393,443	17,331,025
43	TT	Supporting bar 2nos/m	no	100.8000	1,855	186,984
44	BB.19107	Installing plastic pipe form mouth bowl, by glueing method, length of pipe 6 m, diameter of pipe d=89mm	100m	0.0660	8,665,522	571,924
45	BB.24109	Installing steel cudgel by welding method, diameter of cudgel d=80mm	set	2.0000	187,200	374,400
46	BB.29105	Installing plastic cudgel type oral bowl connected by glueing method, diameter of cudgel d=89mm	set	2.0000	41,498	82,996
47	BB.19103	Installing plastic pipe form mouth bowl, by glueing method, length of pipe 6 m, diameter of pipe d=32mm	100m	0.0120	3,296,891	39,563
48	TT	Waste Keeper	no	2.0000	92,695	185,390
49	TT	Inox belt	no	4.0000	9,270	37,080
50	AF.11332	Concrete produced by mixer, cast manually, base concrete, stone 4x6, mark 150	m3	4.8676	1,781,826	8,673,216
51	AB.11313	Digging foundation buttress, wide <= 3 m, depth <= 1 m, soil level III	m3	1.3365	321,423	429,582
52	AF.11111	Concrete produced by mixer, cast manually, concrete lined foundation, stone 4x6, width <=250cm, mark 100	m3	1.3365	1,626,372	2,173,646
53	AE.81414	Build hole block (19x19x39)cm, build vertical wall, thickness <=19 cm, height <=4m, cement mortar mark 75	m3	1.8360	955,871	1,754,979
54	AE.21114	Build brick (6,5x10,5x22), build foundation, thickness <= 33cm, cement mortar mark 75	m3	0.1084	2,291,864	248,438
55	AK.21124	Plaster outside wall, thickness 1,5 cm, cement mortar mark 75	m2	82.0900	97,783	8,027,006
56	AK.21224	Plaster inside wall, thickness 1,5 cm, cement mortar mark 75	m2	113.2951	79,923	9,054,884
57	AK.22124	Plaster pole,column, stairs, thickness 1,5 cm, cement mortar mark 75	m2	31.4760	176,189	5,545,725
58	AK.23114	Plaster beam, cement mortar mark 75	m2	34.4000	125,663	4,322,807
59	AK.23214	Plaster ceiling, cement mortar mark 75	m2	26.8000	170,247	4,562,620
60	AK.26324	Plaster granite overhang wall, Seno, sunshine curtain, thickness 1,5 cm, fine sand cement mortar mark 75	m2	18.3600	584,819	10,737,277
61	AK.26114	Plaster granite edge, scarcement, wall rail, fine sand cement mortar mark 75	m	40.0800	110,497	4,428,720
62	AK.24114	Cover single cornice, fine sand cement mortar mark 75	m	129.5500	76,716	9,938,558
63	AK.31120	Coat brick into wall, pole, column, brick size 200x300mm	m2	1.4000	361,183	505,656
64	AK.51220	Pave base, floor by brick 200x200mm	m2	0.6600	165,180	109,019
65	AK.51250	Pave base, floor by brick 400x400mm	m2	51.0095	166,826	8,509,711
66	TB304	Steel box 30x60x1,5 mmfor purlin	m	48.6000	61,797	3,003,334
67	AK.83422	Paint kinds of iron, steel with 3 layers	m2	8.7480	16,737	146,415
68	AI.11221	Labour Produce steel purlin	Tons	0.1030	4,419,126	455,170
69	AI.61131	Install steel purlin	Tons	0.1030	2,931,959	301,992
70	AK.64310	Make ceiling by plastic plate + frame	m2	36.6175	237,676	8,703,101
71	TB304	Aluminum strap 25x25 around ceilling	m	44.8000	6,798	304,550
72	TB304	Wood door, windows III	m2	21.7800	1,167,956	25,438,082
73	AK.83212	Paint timber 3 layers	m2	16.2400	78,379	1,272,875
74	AH.32211	Install door without frame	m2	21.7800	124,925	2,720,867
75	TT	Steel frame for door, windows 14x14	m2	11.8800	271,906	3,230,243
76	AI.63221	Install decorating iron door	m2	11.8800	69,381	824,246
77	TT	Hooking	no	15.0000	24,719	370,785
78	TT	Bar locks	no	16.0000	27,809	444,944
79	TT	Viet Tiep Lock door	set	4.0000	92,695	370,780
80	AK.92111	Scan Flinkote to waterproof roof,seno, overhang	m2	4.3200	57,098	246,663
81	AK.84422	Paint beam, ceiling, column, wall inside house without baits by Ici Dulux, 1 layer to line, 2 layers to cover	m2	179.1710	46,611	8,351,339

No	Code	Description	Unit	Quantity	Unit Price (VND)	Amount (VND)
82	AK.84422	Paint beam, ceiling, column, wall inside house without baits by Ici Dulux, 1 layer to line, 2 layers to cover	m2	82.0900	46,611	3,826,297
83	AL.61110	Install construction steel scaffold, outside scaffold, height <=16m	100m2	1.5768	2,446,288	3,857,307
III		Lighting system				
84	BA.18202	Installing on-off system, installing sockets type double socket	set	7.0000	86,397	604,779
85	BA.18101	Installing on-off system, installing switches which have 1 particle per one switch	set	3.0000	137,223	411,669
86	BA.18102	Installing on-off system, installing switches which have 2 particles per one switch	set	1.0000	163,909	163,909
87	BA.15403	Installing joint, wire division box, switch box, fuse box, automat box, size <=60x60mm	box	12.0000	126,047	1,512,564
88	BA.14402	Installing submersible plastic pipe, plastic tray to protect wire, pipe diameter <= 27mm	m	72.0000	98,221	7,071,912
89	BA.19202	Installing 1 phase aptomat, current intensity <= 50A	set	1.0000	1,388,778	1,388,778
90	BA.16206	Dragging and spreading kinds of wire, installing 2 bowels wire 2x4mm2	m	20.0000	42,840	856,800
91	BA.16205	Dragging and spreading kinds of wire, installing 2 bowels wire 2x2,5mm2	m	22.0000	31,860	700,920
92	BA.16204	Dragging and spreading kinds of wire, installing 2 bowels wire 2x1,5mm2	m	50.0000	23,916	1,195,800
93	TT	Isolated Sticking Plaster	roll	2.0000	18,539	37,078
IV		Toilet				
IV.1		*Construction works*				
94	AB.11312	Digging foundation buttress, wide <= 3 m, depth <= 1 m, soil level II	m3	7.3510	212,555	1,562,492
95	AB.13112	Embanking foundation, tight requirement of K = 0.90	m3	2.4500	173,674	425,501
96	AF.11111	Concrete produced by mixer, cast manually, concrete lined foundation, stone 4x6, width <=250cm, mark 100	m3	0.7350	1,626,372	1,195,383
97	AE.21114	Build brick (6,5x10,5x22), build foundation, thickness <= 33cm, cement mortar mark 75	m3	3.5830	2,291,864	8,211,749
98	AF.12313	Concrete produced by mixer, cast manually, beam concrete, house tie, stone 1x2, mark 200	m3	0.2550	2,639,000	672,945
99	AF.81141	Framework for at-spot concrete, timber framework, beam, tie framework	100m2	0.0230	18,739,106	430,999
100	AF.61511	Produce and install steel reinforced concrete at spot, steel reinforced beam, tie, diameter <=10 mm, height <=4m	Tons	0.0330	19,578,462	646,089
101	AE.22214	Build brick (6,5x10,5x22), build vertical wall, thickness <= 33cm, height <=4m, cement mortar mark 75	m3	3.6650	2,463,585	9,029,039
102	AF.12313	Concrete produced by mixer, cast manually, beam concrete, house tie, stone 1x2, mark 200	m3	0.3400	2,639,000	897,260
103	AF.81141	Framework for at-spot concrete, timber framework, beam, tie framework	100m2	0.0310	18,739,106	580,912
104	AF.61511	Produce and install steel reinforced concrete at spot, steel reinforced beam, tie, diameter <=10 mm, height <=4m	Tons	0.0700	19,578,462	1,370,492
105	AF.12413	Concrete produced by mixer, cast manually, camp ceiling concrete, stone 1x2, mark 200	m3	1.4070	2,312,050	3,253,054
106	AF.81151	Framework for at-spot concrete, timber framework, floor, roof framework	100m2	0.1900	14,832,517	2,818,178
107	AF.61711	Produce and install steel reinforced concrete at spot, steel reinforced camp ceiling, height <=16m, diameter <=10 mm	Tons	0.0280	19,144,018	536,033
108	AK.41124	Glaze colorless base, floor, thickness 3,0 cm, cement mortar mark 75	m2	8.5800	78,164	670,647
109	AF.11111	Concrete produced by mixer, cast manually, concrete lined foundation, stone 4x6, width <=250cm, mark 100	m3	0.2800	1,626,372	455,384
110	AE.21114	Build brick (6,5x10,5x22), build foundation, thickness <= 33cm, cement mortar mark 75	m3	0.0490	2,291,864	112,301
111	AK.41123	Glaze colorless base, floor, thickness 3,0 cm, cement mortar mark 50	m2	3.2920	72,750	239,493
112	AK.51240	Pave base, floor by brick 300x300mm	m2	3.4460	163,247	562,549
113	AK.21124	Plaster outside wall, thickness 1,5 cm, cement mortar mark 75	m2	37.7020	97,783	3,686,615
114	AK.23214	Plaster ceiling, cement mortar mark 75	m2	17.8380	170,247	3,036,866
115	AK.31130	Coat brick into wall, pole, column, brick size 300x300mm	m2	14.3420	313,364	4,494,266
116	AK.81130	Scan cement water with 2 layers	m2	41.1970	11,139	458,893
117	SB.83320	Painting 3 layers	m2	41.1970	91,262	3,759,721
118	AI.63121	Install iron frame door, aluminum frame door	m2	1.8700	98,570	184,326
IV.2		*Septic tank*				
119	AB.11322	Digging foundation buttress, wide <= 3 m, depth <= 2 m, soil level II	m3	2.2000	228,108	501,838
120	AB.13112	Embanking foundation, tight requirement of K = 0.90	m3	0.7330	173,674	127,303
121	AF.11111	Concrete produced by mixer, cast manually, concrete lined foundation, stone 4x6, width <=250cm, mark 100	m3	0.1260	1,626,372	204,923

No	Code	Description	Unit	Quantity	Unit Price (VND)	Amount (VND)
122	AF.81111	Framework for at-spot concrete, timber framework, long foundation framework, machine foundation	100m2	0.0070	9,720,836	68,046
123	AF.61110	Produce and install steel reinforced concrete at spot, steel reinforced foundation, diameter <= 10 mm	Tons	0.0170	18,220,769	309,753
124	AF.11213	Concrete produced by mixer, cast manually, foundation concrete, stone 1x2, width <=250cm, mark 200	m3	0.1890	1,995,830	377,212
125	AE.26114	Build brick (6,5x10,5x22), build tank, cement mortar mark 75	m3	0.4970	2,963,074	1,472,648
126	AK.21224	Plaster inside wall, thickness 1,5 cm, cement mortar mark 75	m2	5.0890	79,923	406,728
127	AK.21214	Plaster inside wall, thickness 1,0 cm, cement mortar mark 75	m2	5.0890	59,297	301,762
128	AK.41214	Glaze colored base, floor, thickness 2,0 cm, cement mortar mark 75	m2	1.1830	60,981	72,141
129	AF.81152	Framework for at-spot concrete, timber framework, lintel framework, lintel closed cornice, water gutters, plate	100m2	0.0080	15,284,288	122,274
130	SB.21961	Fabricating steel bar for lintel with steel bar D <=10mm		0.0700	3,326,924	232,885
131	AF.12513	Concrete produced by mixer, cast manually, lintel concrete, lintel closed cornice, water gutters, overhang, stone 1x2, mark 200	m3	0.1020	2,679,295	273,288
132	AG.42131	Install precast concrete components, install precast concrete components manually, weight <=250kg	Items	3.0000	142,111	426,333
IV.3		Electric				
133	BA.19202	Installing 1 phase aptomat, current intensity <= 50A	set	1.0000	1,388,778	1,388,778
134	BA.16205	Dragging and spreading kinds of wire, installing 2 bowels wire 2x2,5mm2	m	15.0000	31,860	477,900
135	BA.16204	Dragging and spreading kinds of wire, installing 2 bowels wire 2x1,5mm2	m	20.0000	23,916	478,320
136	BA.14302	Installing emergent plastic pipe, plastic tray to protect wire, pipe diameter <= 27mm	m	20.0000	35,467	709,340
137	BA.18102	Installing on-off system, installing switches which have 2 particles per one switch	set	1.0000	163,909	163,909
138	BA.18202	Installing on-off system, installing sockets type double socket	set	1.0000	86,397	86,397
139	AK.77631	Produce and install ceiling light box, floating, plywood covering	m2	1.0000	862,281	862,281
140	TT	Pump machine	no	1.0000	1,235,933	1,235,933
IV.4		Water supply				
141	BB.41201	Installing floor typed bowl	set	1.0000	2,269,579	2,269,579
142	BB.42501	Installing nozzle cleaning toilets	set	1.0000	203,211	203,211
143	BB.42404	Setting paper box	no	1.0000	42,752	42,752
144	BB.41401	Installing lotus fragrance bath with 1 cock, 1 lotus fragrance	set	1.0000	184,998	184,998
145	BB.42401	Installing mirror	set	1.0000	146,636	146,636
146	BB.42404	Setting soap box	no	1.0000	42,752	42,752
147	BB.19302	Installing PVC plastic pipe connected by welding method, length of pipe 6 m, diameter of pipe d=25mm	100m	0.1600	5,551,123	888,180
148	BB.19301	Installing PVC plastic pipe connected by welding method, length of pipe 6 m, diameter of pipe d=20mm	100m	0.1500	5,046,425	756,964
149	BB.30324	Installing aluminum plastic sleeve, sleeve diameter d=26mm	set	3.0000	44,859	134,577
150	BB.30323	Installing aluminum plastic sleeve, sleeve diameter d=20mm	set	3.0000	37,384	112,152
151	BB.29202	Installing plastic cudgel connecting connected by welding method, diameter of cudgel d=25mm	set	1.0000	35,823	35,823
152	BB.29222	Installing plastic phial connected by welding method, diameter of phial d=25mm	set	4.0000	36,982	147,928
153	BB.29221	Installing plastic phial connected by welding method, diameter of phial d=20mm	set	4.0000	31,141	124,564
154	BB.43101	Installing inox water tank, capacity of water tank 0,5m3	set	1.0000	2,678,959	2,678,959
Total						401,654,671
Round total						401,655,000

Table D-4 Typical Cost Estimation for Construction of Silviculture Infrastructure: Forest Guard Station

Type of Infrastructure Forest Guard Station

Province: Lai Chau

No	Code	Description	Unit	Quantity	Unit Price (VND)	Amount (VND)
I		Leveling works				
1	AB.11213	Digging soil for embanking or removing to waste yard or gethered ground, soil level III	m3	36.4000	202,186	7,359,570
2	AB.13112	Embanking foundation, tight requirement of K = 0.90	m3	20.0000	173,674	3,473,480
3	AB.11912	Transportation soil next 10m manually, soil level II	m3	16.4000	82,948	1,360,347
II		Construction works				
4	AB.11443	Diging foundation column, cylinder, test pit, large> 1 m, depth> 1 m, soil level III	m3	18.8600	391,412	7,382,030
5	AB.11313	Digging foundation buttress, wide <= 3 m, depth <= 1 m, soil level III	m3	2.2410	321,423	720,309
6	AF.11111	Concrete produced by mixer, cast manually, concrete lined foundation, stone 4x6, width <=250cm, mark 100	m3	2.3820	1,814,101	4,321,189
7	AF.81122	Framework for at-spot concrete, timber framework, square and rectangle column foundation framework	100m2	0.1008	14,614,699	1,473,162
8	AF.61110	Produce and install steel reinforced concrete at spot, steel reinforced foundation, diameter <= 10 mm	tấn	0.1061	19,582,628	2,077,717
9	AF.61120	Produce and install steel reinforced concrete at spot, steel reinforced foundation, diameter <= 18 mm	tấn	0.0981	19,801,667	1,942,544
10	AF.11213	Concrete produced by mixer, cast manually, foundation concrete, stone 1x2, width <=250cm, mark 200	m3	3.8377	2,253,592	8,648,610
11	AF.81132	Framework for at-spot concrete, timber framework, square, rectangle column framework	100m2	0.0936	16,279,780	1,523,787
12	AF.12213	Concrete produced by mixer, cast manually, column concrete, stone 1x2, column section <=0,1m2, height <=4m, mark 200	m3	0.5130	3,199,188	1,641,183
13	AE.81414	Build hole block (19x19x39)cm, build vertical wall, thickness <=19 cm, height <=4m, cement mortar mark 75	m3	3.4080	1,477,303	5,034,649
14	AF.81141	Framework for at-spot concrete, timber framework, beam, tie framework	100m2	0.2163	19,237,602	4,161,093
15	AF.61511	Produce and install steel reinforced concrete at spot, steel reinforced beam, tie, diameter <=10 mm, height <=4m	tấn	0.0580	20,940,322	1,214,539
16	AF.61521	Produce and install steel reinforced concrete at spot, steel reinforced beam, tie, diameter <=18 mm, height <=4m	tấn	0.2589	20,281,892	5,250,982
17	AF.12313	Concrete produced by mixer, cast manually, beam concrete, house tie, stone 1x2, mark 200	m3	1.5079	2,900,423	4,373,548
18	AB.13112	Embanking foundation, tight requirement of K = 0.90	m3	27.9905	173,674	4,861,222
19	AF.61411	Produce and install steel reinforced concrete at spot, steel reinforced column, post, diameter <=10 mm, column and post height <=4m	tấn	0.0418	20,573,075	859,955
20	AF.61421	Produce and install steel reinforced concrete at spot, steel reinforced column, post, diameter <=1 mm, column and post height <=4m	tấn	0.1735	20,291,284	3,520,538
21	AF.81132	Framework for at-spot concrete, timber framework, square, rectangle column framework	100m2	0.2932	16,279,780	4,773,231
22	AF.12213	Concrete produced by mixer, cast manually, column concrete, stone 1x2, column section <=0,1m2, height <=4m, mark 200	m3	1.2455	3,199,188	3,984,589
23	AE.71213	Build wall by 6-hole hollow brick (10x15x22), thickness >10 cm, height <=4m, cement mortar mark 50	m3	13.4275	1,254,297	16,842,073
24	AE.22114	Build brick (6,5x10,5x22), build vertical wall, thickness <=11 cm, height <=4m, cement mortar mark 75	m3	1.5598	2,310,664	3,604,174
25	AF.81141	Framework for at-spot concrete, timber framework, beam, tie framework	100m2	0.3421	19,237,602	6,581,184
26	AF.81151	Framework for at-spot concrete, timber framework, floor, roof framework	100m2	0.2669	15,236,791	4,066,700
27	AF.61511	Produce and install steel reinforced concrete at spot, steel reinforced beam, tie, diameter <=10 mm, height <=4m	tấn	0.0715	20,940,322	1,497,233
28	AF.61521	Produce and install steel reinforced concrete at spot, steel reinforced beam, tie, diameter <=18 mm, height <=4m	tấn	0.3764	20,281,892	7,634,104
29	AF.61711	Produce and install steel reinforced concrete at spot, steel reinforced camp ceiling, height <=16m, diameter <=10 mm	tấn	0.1541	20,505,924	3,159,963
30	AF.12313	Concrete produced by mixer, cast manually, beam concrete, house tie, stone 1x2, mark 200	m3	2.3457	2,900,423	6,803,522

No	Code	Description	Unit	Quantity	Unit Price (VND)	Amount (VND)
31	AF.12413	Concrete produced by mixer, cast manually, camp ceiling concrete, stone 1x2, mark 200	m3	2.6800	2,572,888	6,895,340
32	AK.82210	Cover by cement to wall	m2	26.8000	38,490	1,031,532
33	AF.61612	Produce and install steel reinforced concrete at spot, steel reinforced lintel closed cornice, water gutters, diameter <=10 mm, height <=16m	tấn	0.1299	22,607,166	2,936,671
34	AF.81152	Framework for at-spot concrete, timber framework, lintel framework, lintel closed cornice, water gutters, plate	100m2	0.2489	15,688,563	3,904,883
35	AF.12513	Concrete produced by mixer, cast manually, lintel concrete, lintel closed cornice, water gutters, overhang, stone 1x2, mark 200	m3	1.3503	2,940,132	3,970,060
36	AE.33114	Build column by brick 5x10x20, high <=4m, cement mortar mark 75	m3	0.5400	2,219,044	1,198,284
37	AE.32114	Build brick (5x10x20), build vertical wall, thickness <=10 cm, height <=4m, cement mortar mark 75	m3	0.2680	1,793,572	480,677
38	TB304	Zinc-coated Steel box 30x60x1,5 mm for purlin	md	85.5000	61,797	5,283,644
39	AK.83422	Paint kinds of iron, steel with 3 layers	m2	15.3900	16,633	255,982
40	AI.11221	Produce steel purlin	tấn	0.1510	2,827,529	426,957
41	AI.61131	Install steel purlin	tấn	0.1510	3,024,509	456,701
42	AK.12222	Roofing to cover wall by corrugated iron, at any length	100m2	0.6825	24,612,498	16,798,030
43	TT	Supporting bar 2nos/m	cái	100.8000	1,855	186,984
44	BB.19107	Installing plastic pipe form mouth bowl, by glueing method, length of pipe 6 m, diameter of pipe d=89mm	100m	0.0660	6,564,625	433,265
45	BB.24109	Installing steel cudgel by welding method, diameter of cudgel d=80mm	cái	2.0000	188,235	376,470
46	BB.29105	Installing plastic cudgel type oral bowl connected by glueing method, diameter of cudgel d=89mm	cái	2.0000	41,498	82,996
47	BB.19103	Installing plastic pipe form mouth bowl, by glueing method, length of pipe 6 m, diameter of pipe d=32mm	100m	0.0120	2,271,212	27,255
48	TT	Waste Keeper	cái	2.0000	92,695	185,390
49	TT	Inox belt	cái	4.0000	9,270	37,080
50	AF.11332	Concrete produced by mixer, cast manually, base concrete, stone 4x6, mark 150	m3	4.8676	1,987,486	9,674,287
51	AB.11313	Digging foundation buttress, wide <= 3 m, depth <= 1 m, soil level III	m3	1.3365	321,423	429,582
52	AF.11111	Concrete produced by mixer, cast manually, concrete lined foundation, stone 4x6, width <=250cm, mark 100	m3	1.3365	1,814,101	2,424,546
53	AE.81414	Build hole block (19x19x39)cm, build vertical wall, thickness <=19 cm, height <=4m, cement mortar mark 75	m3	1.8360	1,477,303	2,712,328
54	AE.21114	Build brick (6,5x10,5x22), build foundation, thickness <= 33cm, cement mortar mark 75	m3	0.1084	1,952,545	211,656
55	AK.21124	Plaster outside wall, thickness 1,5 cm, cement mortar mark 75	m2	82.0900	104,748	8,598,763
56	AK.21224	Plaster inside wall, thickness 1,5 cm, cement mortar mark 75	m2	113.2951	86,888	9,843,985
57	AK.22124	Plaster pole,column, stairs, thickness 1,5 cm, cement mortar mark 75	m2	31.4760	183,549	5,777,388
58	AK.23114	Plaster beam, cement mortar mark 75	m2	34.4000	133,022	4,575,957
59	AK.23214	Plaster ceiling, cement mortar mark 75	m2	26.8000	177,606	4,759,841
60	AK.26324	Plaster granite overhang wall, Seno, sunshine curtain, thickness 1,5 cm, fine sand cement mortar mark 75	m2	18.3600	427,021	7,840,106
61	AK.26114	Plaster granite edge, scarcement, wall rail, fine sand cement mortar mark 75	m	40.0800	109,574	4,391,726
62	AK.24114	Cover single cornice, fine sand cement mortar mark 75	m	129.5500	80,600	10,441,730
63	AK.31120	Coat brick into wall, pole, column, brick size 200x300mm	m2	1.4000	326,998	457,797
64	AK.51220	Pave base, floor by brick 200x200mm	m2	0.6600	191,369	126,304
65	AK.51250	Pave base, floor by brick 400x400mm	m2	51.0095	252,263	12,867,809
66	TB304	Steel box 30x60x1,5 mmfor purlin		48.6000	61,797	3,003,334
67	AK.83422	Paint kinds of iron, steel with 3 layers	m2	8.7480	16,633	145,505
68	AI.11221	Produce steel purlin		0.1030	4,419,126	455,170
69	AI.61131	Install steel purlin	tấn	0.1030	3,024,509	311,524
70	AK.64310	Make ceiling by plastic plate + frame	m2	36.6175	139,690	5,115,099
71	TB304	Aluminum strap 25x25 around ceilling	m	44.8000	6,798	304,550
72	TB304	Wood door, windows III	m2	21.7800	1,167,956	25,438,082
73	AK.83212	Paint timber 3 layers	m2	16.2400	52,659	855,182
74	AH.32211	Install door without frame	m2	21.7800	122,461	2,667,201
75	TT	Steel frame for door, windows 14x14	m2	11.8800	271,906	3,230,243
76	AI.63221	Install decorating iron door	m2	11.8800	70,346	835,710
77	TT	Hooking	cái	15.0000	24,719	370,785
78	TT	Bar locks	cái	16.0000	27,809	444,944
79	TT	Viet Tiep Lock door	bộ	4.0000	92,695	370,780

No	Code	Description	Unit	Quantity	Unit Price (VND)	Amount (VND)
80	AK.92111	Scan Flinkote to waterproof roof,seno, overhang	m2	4.3200	57,230	247,234
81	AK.84422	Paint beam, ceiling, column, wall inside house without baits by Ici Dulux, 1 layer to line, 2 layers to cover	m2	179.1710	41,560	7,446,347
82	AK.84422	Paint beam, ceiling, column, wall inside house without baits by Ici Dulux, 1 layer to line, 2 layers to cover	m2	82.0900	41,560	3,411,660
83	AL.61110	Install construction steel scaffold, outside scaffold, height <=16m	100m2	1.5768	2,345,844	3,698,927
III		Lighting system				
84	BA.18202	Installing on-off system, installing sockets type double socket	cái	7.0000	79,028	553,196
85	BA.18101	Installing on-off system, installing switches which have 1 particle per one switch	cái	3.0000	131,083	393,249
86	BA.18102	Installing on-off system, installing switches which have 2 particles per one switch	cái	1.0000	157,156	157,156
87	BA.15403	Installing joint, wire division box, switch box, fuse box, automat box, size <=60x60mm	hộp	12.0000	67,850	814,200
88	BA.14402	Installing submersible plastic pipe, plastic tray to protect wire, pipe diameter <= 27mm	m	72.0000	59,445	4,280,040
89	BA.19202	Installing 1 phase aptomat, current intensity <= 50A	cái	1.0000	188,621	188,621
90	BA.16206	Dragging and spreading kinds of wire, installing 2 bowels wire 2x4mm2	m	20.0000	40,692	813,840
91	BA.16205	Dragging and spreading kinds of wire, installing 2 bowels wire 2x2,5mm2	m	22.0000	29,713	653,686
92	BA.16204	Dragging and spreading kinds of wire, installing 2 bowels wire 2x1,5mm2	m	50.0000	22,074	1,103,700
93	TT	Isolated Sticking Plaster	cuộn	2.0000	18,539	37,078
IV		Toilet				
IV.1		Construction works				
94	AB.11312	Digging foundation buttress, wide <= 3 m, depth <= 1 m, soil level II	m3	7.3510	212,556	1,562,499
95	AB.13112	Embanking foundation, tight requirement of K = 0.90	m3	2.4500	173,674	425,501
96	AF.11111	Concrete produced by mixer, cast manually, concrete lined foundation, stone 4x6, width <=250cm, mark 100	m3	0.7350	1,814,101	1,333,364
97	AE.21114	Build brick (6,5x10,5x22), build foundation, thickness <= 33cm, cement mortar mark 75	m3	3.5830	1,952,545	6,995,969
98	AF.12313	Concrete produced by mixer, cast manually, beam concrete, house tie, stone 1x2, mark 200	m3	0.2550	2,900,423	739,608
99	AF.81141	Framework for at-spot concrete, timber framework, beam, tie framework	100m2	0.0230	19,237,602	442,465
100	AF.61511	Produce and install steel reinforced concrete at spot, steel reinforced beam, tie, diameter <=10 mm, height <=4m	tấn	0.0330	20,940,322	691,031
101	AE.22214	Build brick (6,5x10,5x22), build vertical wall, thickness <= 33cm, height <=4m, cement mortar mark 75	m3	3.6650	2,107,509	7,724,020
102	AF.12313	Concrete produced by mixer, cast manually, beam concrete, house tie, stone 1x2, mark 200	m3	0.3400	2,900,423	986,144
103	AF.81141	Framework for at-spot concrete, timber framework, beam, tie framework	100m2	0.0310	19,237,602	596,366
104	AF.61511	Produce and install steel reinforced concrete at spot, steel reinforced beam, tie, diameter <=10 mm, height <=4m	tấn	0.0700	20,940,322	1,465,823
105	AF.12413	Concrete produced by mixer, cast manually, camp ceiling concrete, stone 1x2, mark 200	m3	1.4070	2,572,888	3,620,053
106	AF.81151	Framework for at-spot concrete, timber framework, floor, roof framework	100m2	0.1900	15,236,791	2,894,990
107	AF.61711	Produce and install steel reinforced concrete at spot, steel reinforced camp ceiling, height <=16m, diameter <=10 mm	tấn	0.0280	20,505,924	574,166
108	AK.41124	Glaze colorless base, floor, thickness 3,0 cm, cement mortar mark 75	m2	8.5800	85,012	729,403
109	AF.11111	Concrete produced by mixer, cast manually, concrete lined foundation, stone 4x6, width <=250cm, mark 100	m3	0.2800	1,814,101	507,948
110	AE.21114	Build brick (6,5x10,5x22), build foundation, thickness <= 33cm, cement mortar mark 75	m3	0.0490	1,952,545	95,675
111	AK.41123	Glaze colorless base, floor, thickness 3,0 cm, cement mortar mark 50	m2	3.2920	78,042	256,914
112	AK.51240	Pave base, floor by brick 300x300mm	m2	3.4460	193,706	667,511
113	AK.21124	Plaster outside wall, thickness 1,5 cm, cement mortar mark 75	m2	37.7020	104,748	3,949,209
114	AK.23214	Plaster ceiling, cement mortar mark 75	m2	17.8380	177,606	3,168,136
115	AK.31130	Coat brick into wall, pole, column, brick size 300x300mm	m2	14.3420	310,461	4,452,632
116	AK.81130	Scan cement water with 2 layers	m2	41.1970	11,791	485,754
117	AK.84112	Painting 3 layers	m2	41.1970	28,393	1,169,706

No	Code	Description	Unit	Quantity	Unit Price (VND)	Amount (VND)
118	AI.63121	Install iron frame door, aluminum frame door	m2	1.8700	99,486	186,039
IV.2		Septic tank				
119	AB.11322	Digging foundation buttress, wide <= 3 m, depth <= 2 m, soil level II	m3	2.2000	228,108	501,838
120	AB.13112	Embanking foundation, tight requirement of K = 0.90	m3	0.7330	173,674	127,303
121	AF.11111	Concrete produced by mixer, cast manually, concrete lined foundation, stone 4x6, width <=250cm, mark 100	m3	0.1260	1,814,101	228,577
122	AF.81111	Framework for at-spot concrete, timber framework, long foundation framework, machine foundation	100m2	0.0070	10,064,913	70,454
123	AF.61110	Produce and install steel reinforced concrete at spot, steel reinforced foundation, diameter <= 10 mm	tấn	0.0170	19,582,628	332,905
124	AF.11213	Concrete produced by mixer, cast manually, foundation concrete, stone 1x2, width <=250cm, mark 200	m3	0.1890	2,253,592	425,929
125	AE.26114	Build brick (6,5x10,5x22), build tank, cement mortar mark 75	m3	0.4970	2,613,849	1,299,083
126	AK.21224	Plaster inside wall, thickness 1,5 cm, cement mortar mark 75	m2	5.0890	86,888	442,173
127	AK.21214	Plaster inside wall, thickness 1,0 cm, cement mortar mark 75	m2	0.1890	64,206	12,135
128	AK.41214	Glaze colored base, floor, thickness 2,0 cm, cement mortar mark 75	m2	1.1830	66,048	78,135
129	AF.81152	Framework for at-spot concrete, timber framework, lintel framework, lintel closed cornice, water gutters, plate	100m2	0.0080	15,688,563	125,509
130	AG.13221	Fabricating steel bar for lintel with steel bar D <=10mm	tấn	0.0700	23,885,794	1,672,006
131	AF.12513	Concrete produced by mixer, cast manually, lintel concrete, lintel closed cornice, water gutters, overhang, stone 1x2, mark 200	m3	0.1020	2,940,132	299,893
132	AG.42131	Install precast concrete components, install precast concrete components manually, weight <=250kg	cái	3.0000	146,750	440,250
IV.3		Electric				
133	BA.19202	Installing 1 phase aptomat, current intensity <= 50A	cái	1.0000	188,621	188,621
134	BA.16205	Dragging and spreading kinds of wire, installing 2 bowels wire 2x2,5mm2	m	15.0000	29,713	445,695
135	BA.16204	Dragging and spreading kinds of wire, installing 2 bowels wire 2x1,5mm2	m	20.0000	22,074	441,480
136	BA.14302	Installing emergent plastic pipe, plastic tray to protect wire, pipe diameter <= 27mm	m	20.0000	22,916	458,320
137	BA.18102	Installing on-off system, installing switches which have 2 particles per one switch	cái	1.0000	157,156	157,156
138	BA.18202	Installing on-off system, installing sockets type double socket	cái	1.0000	79,028	79,028
139	AK.77631	Produce and install ceiling light box, floating, plywood covering	m2	1.0000	890,184	890,184
140	TT	Pump machine		1.0000	1,235,933	1,235,933
IV.4		Water supply				
141	BB.41201	Installing floor typed bowl	bộ	1.0000	2,269,579	2,269,579
142	BB.42501	Installing nozzle cleaning toilets	cái	1.0000	203,211	203,211
143	BB.42404	Setting paper box	cái	1.0000	42,816	42,816
144	BB.41401	Installing lotus fragrance bath with 1 cock, 1 lotus fragrance	bộ	1.0000	184,998	184,998
145	BB.42401	Installing mirror	cái	1.0000	146,760	146,760
146	BB.42404	Setting soap box	cái	1.0000	42,816	42,816
147	BB.19302	Installing PVC plastic pipe connected by welding method, length of pipe 6 m, diameter of pipe d=25mm	100m	0.1600	3,149,321	503,891
148	BB.19301	Installing PVC plastic pipe connected by welding method, length of pipe 6 m, diameter of pipe d=20mm	100m	0.1500	2,837,808	425,671
149	BB.30324	Installing aluminum plastic sleeve, sleeve diameter d=26mm	cái	3.0000	44,859	134,577
150	BB.30323	Installing aluminum plastic sleeve, sleeve diameter d=20mm	cái	3.0000	37,384	112,152
151	BB.29202	Installing plastic cudgel connecting connected by welding method, diameter of cudgel d=25mm	cái	1.0000	36,034	36,034
152	BB.29222	Installing plastic phial connected by welding method, diameter of phial d=25mm	cái	4.0000	37,193	148,772
153	BB.29221	Installing plastic phial connected by welding method, diameter of phial d=20mm	cái	4.0000	31,332	125,328
154	BB.43101	Installing inox water tank, capacity of water tank 0,5m3	bể	1.0000	2,390,172	2,390,172
Total						390,036,586
Round total						390,037,000

Table D-4 Typical Cost Estimation for Construction of Silviculture Infrastructure: Forest Guard Station

Type of Infrastructure Forest Guard Station

Province: Sơn La

No	Code	Description	Unit	Quantity	Unit Price (VND)	Amount (VND)
I		Leveling works				
1	AB.11213	Digging soil for embanking or removing to waste yard or gethered ground, soil level III	m3	36.4000	202,186	7,359,570
2	AB.13112	Embanking foundation, tight requirement of K = 0.90	m3	20.0000	173,674	3,473,480
3	AB.11912	Transportation soil next 10m manually, soil level II	m3	16.4000	82,948	1,360,347
II		Construction works				
4	AB.11443	Diging foundation column, cylinder, test pit, large> 1 m, depth> 1 m, soil level III	m3	18.8600	391,412	7,382,030
5	AB.11313	Digging foundation buttress, wide <= 3 m, depth <= 1 m, soil level III	m3	2.2410	321,424	720,311
6	AF.11111	Concrete produced by mixer, cast manually, concrete lined foundation, stone 4x6, width <=250cm, mark 100	m3	2.3820	1,641,872	3,910,939
7	AF.81122	Framework for at-spot concrete, timber framework, square and rectangle column foundation framework	100m2	0.1008	13,532,677	1,364,094
8	AF.61110	Produce and install steel reinforced concrete at spot, steel reinforced foundation, diameter <= 10 mm	Tons	0.1061	19,716,844	2,091,957
9	AF.61120	Produce and install steel reinforced concrete at spot, steel reinforced foundation, diameter <= 18 mm	Tons	0.0981	19,354,081	1,898,635
10	AF.11213	Concrete produced by mixer, cast manually, foundation concrete, stone 1x2, width <=250cm, mark 200	m3	3.8377	2,395,125	9,191,771
11	AF.81132	Framework for at-spot concrete, timber framework, square, rectangle column framework	100m2	0.0936	15,117,369	1,414,986
12	AF.12213	Concrete produced by mixer, cast manually, column concrete, stone 1x2, column section <=0,1m2, height <=4m, mark 200	m3	0.5130	3,411,188	1,749,939
13	AE.81414	Build hole block (19x19x39)cm, build vertical wall, thickness <=19 cm, height <=4m, cement mortar mark 75	m3	3.4080	999,263	3,405,488
14	AF.81141	Framework for at-spot concrete, timber framework, beam, tie framework	100m2	0.2163	17,672,787	3,822,624
15	AF.61511	Produce and install steel reinforced concrete at spot, steel reinforced beam, tie, diameter <=10 mm, height <=4m	Tons	0.0580	21,074,536	1,222,323
16	AF.61521	Produce and install steel reinforced concrete at spot, steel reinforced beam, tie, diameter <=18 mm, height <=4m	Tons	0.2589	19,832,497	5,134,633
17	AF.12313	Concrete produced by mixer, cast manually, beam concrete, house tie, stone 1x2, mark 200	m3	1.5079	3,035,812	4,577,701
18	AB.13112	Embanking foundation, tight requirement of K = 0.90	m3	27.9905	173,674	4,861,222
19	AF.61411	Produce and install steel reinforced concrete at spot, steel reinforced column, post, diameter <=10 mm, column and post height <=4m	Tons	0.0418	20,707,291	865,565
20	AF.61421	Produce and install steel reinforced concrete at spot, steel reinforced column, post, diameter <=1 mm, column and post height <=4m	Tons	0.1735	19,838,139	3,441,917
21	AF.81132	Framework for at-spot concrete, timber framework, square, rectangle column framework	100m2	0.2932	15,117,369	4,432,413
22	AF.12213	Concrete produced by mixer, cast manually, column concrete, stone 1x2, column section <=0,1m2, height <=4m, mark 200	m3	1.2455	3,411,188	4,248,635
23	AE.71213	Build wall by 6-hole hollow brick (10x15x22), thickness >10 cm, height <=4m, cement mortar mark 50	m3	13.4275	1,527,372	20,508,788
24	AE.22114	Build brick (6,5x10,5x22), build vertical wall, thickness <=11 cm, height <=4m, cement mortar mark 75	m3	1.5598	2,707,027	4,222,421
25	AF.81141	Framework for at-spot concrete, timber framework, beam, tie framework	100m2	0.3421	17,672,787	6,045,860
26	AF.81151	Framework for at-spot concrete, timber framework, floor, roof framework	100m2	0.2669	13,969,208	3,728,382
27	AF.61511	Produce and install steel reinforced concrete at spot, steel reinforced beam, tie, diameter <=10 mm, height <=4m	Tons	0.0715	21,074,536	1,506,829
28	AF.61521	Produce and install steel reinforced concrete at spot, steel reinforced beam, tie, diameter <=18 mm, height <=4m	Tons	0.3764	19,832,497	7,464,952
29	AF.61711	Produce and install steel reinforced concrete at spot, steel reinforced camp ceiling, height <=16m, diameter <=10 mm	Tons	0.1541	20,639,878	3,180,605
30	AF.12313	Concrete produced by mixer, cast manually, beam concrete, house tie, stone 1x2, mark 200	m3	2.3457	3,035,812	7,121,104
31	AF.12413	Concrete produced by mixer, cast manually, camp ceiling concrete, stone 1x2, mark 200	m3	2.6800	2,711,315	7,266,324

No	Code	Description	Unit	Quantity	Unit Price (VND)	Amount (VND)
32	AK.82210	Cover by cement to wall	m2	26.8000	38,645	1,035,686
33	AF.61612	Produce and install steel reinforced concrete at spot, steel reinforced lintel closed cornice, water gutters, diameter <=10 mm, height <=16m	Tons	0.1299	22,739,971	2,953,922
34	AF.81152	Framework for at-spot concrete, timber framework, lintel framework, lintel closed cornice, water gutters, plate	100m2		14,420,979	
35	AF.12513	Concrete produced by mixer, cast manually, lintel concrete, lintel closed cornice, water gutters, overhang, stone 1x2, mark 200	m3	1.3503	3,078,560	4,156,980
36	AE.33114	Build column by brick 5x10x20, high <=4m, cement mortar mark 75	m3	0.5400	2,159,669	1,166,221
37	AE.32114	Build brick (5x10x20), build vertical wall, thickness <=10 cm, height <=4m, cement mortar mark 75	m3	0.2680	1,749,128	468,766
38	TB304	Zinc-coated Steel box 30x60x1,5 mm for purlir	m	85.5000	61,797	5,283,644
39	AK.83422	Paint kinds of iron, steel with 3 layers	m2	15.3900	16,737	257,582
40	AI.11221	Labour Produce steel purlin	Tons	0.1510	2,827,529	426,957
41	AI.61131	Install steel purlin	Tons	0.1510	2,610,000	394,110
42	AK.12222	Roofing to cover wall by corrugated iron, at any length	100m2	0.6825	26,258,862	17,921,673
43	TT	Supporting bar 2nos/m	no	100.8000	1,855	186,984
44	BB.19107	Installing plastic pipe form mouth bowl, by glueing method, length of pipe 6 m, diameter of pipe d=89mm	100m	0.0660	6,776,868	447,273
45	BB.24109	Installing steel cudgel by welding method, diameter of cudgel d=80mm	set	2.0000	185,185	370,370
46	BB.29105	Installing plastic cudgel type oral bowl connected by glueing method, diameter of cudgel d=89mm	set	2.0000	41,500	83,000
47	BB.19103	Installing plastic pipe form mouth bowl, by glueing method, length of pipe 6 m, diameter of pipe d=32mm	100m	0.0120	2,296,187	27,554
48	TT	Waste Keeper	no	2.0000	92,695	185,390
49	TT	Inox belt	no	4.0000	9,270	37,080
50	AF.11332	Concrete produced by mixer, cast manually, base concrete, stone 4x6, mark 150	m3	4.8676	1,813,163	8,825,752
51	AB.11313	Digging foundation buttress, wide <= 3 m, depth <= 1 m, soil level III	m3	1.3365	321,424	429,583
52	AF.11111	Concrete produced by mixer, cast manually, concrete lined foundation, stone 4x6, width <=250cm, mark 100	m3	1.3365	1,641,872	2,194,362
53	AE.81414	Build hole block (19x19x39)cm, build vertical wall, thickness <=19 cm, height <=4m, cement mortar mark 75	m3	1.8360	999,263	1,834,647
54	AE.21114	Build brick (6,5x10,5x22), build foundation, thickness <= 33cm, cement mortar mark 75	m3	0.1084	2,250,849	243,992
55	AK.21124	Plaster outside wall, thickness 1,5 cm, cement mortar mark 75	m2	82.0900	106,499	8,742,503
56	AK.21224	Plaster inside wall, thickness 1,5 cm, cement mortar mark 75	m2	113.2951	88,641	10,042,591
57	AK.22124	Plaster pole,column, stairs, thickness 1,5 cm, cement mortar mark 75	m2	31.4760	185,404	5,835,776
58	AK.23114	Plaster beam, cement mortar mark 75	m2	34.4000	134,875	4,639,700
59	AK.23214	Plaster ceiling, cement mortar mark 75	m2	26.8000	179,460	4,809,528
60	AK.26324	Plaster granite overhang wall, Seno, sunshine curtain, thickness 1,5 cm, fine sand cement mortar mark 75	m2	18.3600	444,425	8,159,643
61	AK.26114	Plaster granite edge, scarcement, wall rail, fine sand cement mortar mark 75	m	40.0800	111,190	4,456,495
62	AK.24114	Cover single cornice, fine sand cement mortar mark 75	m	129.5500	82,476	10,684,766
63	AK.31120	Coat brick into wall, pole, column, brick size 200x300mm	m2	1.4000	319,835	447,769
64	AK.51220	Pave base, floor by brick 200x200mm	m2	0.6600	210,071	138,647
65	AK.51250	Pave base, floor by brick 400x400mm	m2	51.0095	180,754	9,220,171
66	TB304	Steel box 30x60x1,5 mmfor purlin	m	48.6000	61,797	3,003,334
67	AK.83422	Paint kinds of iron, steel with 3 layers	m2	8.7480	16,737	146,415
68	AI.11221	Labour Produce steel purlin	Tons	0.1030	4,419,126	455,170
69	AI.61131	Install steel purlin	Tons	0.1030	2,610,000	268,830
70	AK.64310	Make ceiling by plastic plate + frame	m2	36.6175	66,710	2,442,753
71	TB304	Aluminum strap 25x25 around ceilling	m	44.8000	6,798	304,550
72	TB304	Wood door, windows III	m2	21.7800	1,167,956	25,438,082
73	AK.83212	Paint timber 3 layers	m2	16.2400	69,279	1,125,091
74	AH.32211	Install door without frame	m2	21.7800	129,301	2,816,176
75	TT	Steel frame for door, windows 14x14	m2	11.8800	271,906	3,230,243
76	AI.63221	Install decorating iron door	m2	11.8800	70,244	834,499
77	TT	Hooking	no	15.0000	24,719	370,785
78	TT	Bar locks	no	16.0000	27,809	444,944
79	TT	Viet Tiep Lock door	set	4.0000	92,695	370,780
80	AK.92111	Scan Flinkote to waterproof roof,seno, overhang	m2	4.3200	57,098	246,663

No	Code	Description	Unit	Quantity	Unit Price (VND)	Amount (VND)
81	AK.84422	Paint beam, ceiling, column, wall inside house without baits by Ici Dulux, 1 layer to line, 2 layers to cover	m2	179.1710	46,665	8,361,015
82	AK.84422	Paint beam, ceiling, column, wall inside house without baits by Ici Dulux, 1 layer to line, 2 layers to cover	m2	82.0900	46,665	3,830,730
83	AL.61110	Install construction steel scaffold, outside scaffold, height <=16m	100m2	1.5768	2,410,005	3,800,096
III		Lighting system				
84	BA.18202	Installing on-off system, installing sockets type double socke	set	7.0000	79,028	553,196
85	BA.18101	Installing on-off system, installing switches which have 1 particle per one switch	set	3.0000	33,667	101,001
86	BA.18102	Installing on-off system, installing switches which have 2 particles per one switch	set	1.0000	44,092	44,092
87	BA.15403	Installing joint, wire division box, switch box, fuse box, automat box, size <=60x60mm	box	12.0000	65,377	784,524
88	BA.14402	Installing submersible plastic pipe, plastic tray to protect wire, pipe diameter <= 27mm	m	72.0000	57,629	4,149,288
89	BA.19202	Installing 1 phase aptomat, current intensity <= 50A	set	1.0000	147,886	147,886
90	BA.16206	Dragging and spreading kinds of wire, installing 2 bowels wire 2x4mm2	m	20.0000	40,692	813,840
91	BA.16205	Dragging and spreading kinds of wire, installing 2 bowels wire 2x2,5mm2	m	22.0000	29,713	653,686
92	BA.16204	Dragging and spreading kinds of wire, installing 2 bowels wire 2x1,5mm2	m	50.0000	22,075	1,103,750
93	TT	Isolated Sticking Plaster	roll	2.0000	18,539	37,078
IV		Toilet				
IV.1		Construction works				
94	AB.11312	Digging foundation buttress, wide <= 3 m, depth <= 1 m, soil level	m3	7.3510	212,555	1,562,492
95	AB.13112	Embanking foundation, tight requirement of K = 0.90	m3	2.4500	173,674	425,501
96	AF.11111	Concrete produced by mixer, cast manually, concrete lined foundation, stone 4x6, width <=250cm, mark 100	m3	0.7350	1,641,872	1,206,776
97	AE.21114	Build brick (6,5x10,5x22), build foundation, thickness <= 33cm, cement mortar mark 75	m3	3.5830	2,250,849	8,064,792
98	AF.12313	Concrete produced by mixer, cast manually, beam concrete, house tie, stone 1x2, mark 200	m3	0.2550	3,035,812	774,132
99	AF.81141	Framework for at-spot concrete, timber framework, beam, tie framework	100m2	0.0230	17,672,787	406,474
100	AF.61511	Produce and install steel reinforced concrete at spot, steel reinforced beam, tie, diameter <=10 mm, height <=4m	Tons	0.0330	21,074,536	695,460
101	AE.22214	Build brick (6,5x10,5x22), build vertical wall, thickness <= 33cm, height <=4m, cement mortar mark 75	m3	3.6650	2,419,498	8,867,460
102	AF.12313	Concrete produced by mixer, cast manually, beam concrete, house tie, stone 1x2, mark 200	m3	0.3400	3,035,812	1,032,176
103	AF.81141	Framework for at-spot concrete, timber framework, beam, tie framework	100m2	0.0310	17,672,787	547,856
104	AF.61511	Produce and install steel reinforced concrete at spot, steel reinforced beam, tie, diameter <=10 mm, height <=4m	Tons	0.0700	21,074,536	1,475,218
105	AF.12413	Concrete produced by mixer, cast manually, camp ceiling concrete, stone 1x2, mark 200	m3	1.4070	2,711,315	3,814,820
106	AF.81151	Framework for at-spot concrete, timber framework, floor, roof framework	100m2	0.1900	13,969,208	2,654,150
107	AF.61711	Produce and install steel reinforced concrete at spot, steel reinforced camp ceiling, height <=16m, diameter <=10 mm	Tons	0.0280	20,639,878	577,917
108	AK.41124	Glaze colorless base, floor, thickness 3,0 cm, cement mortar mark 75	m2	8.5800	92,635	794,808
109	AF.11111	Concrete produced by mixer, cast manually, concrete lined foundation, stone 4x6, width <=250cm, mark 100	m3	0.2800	1,641,872	459,724
110	AE.21114	Build brick (6,5x10,5x22), build foundation, thickness <= 33cm, cement mortar mark 75	m3	0.0490	2,250,849	110,292
111	AK.41123	Glaze colorless base, floor, thickness 3,0 cm, cement mortar mark 50	m2	3.2920	86,639	285,216
112	AK.51240	Pave base, floor by brick 300x300mm	m2	3.4460	204,907	706,110
113	AK.21124	Plaster outside wall, thickness 1,5 cm, cement mortar mark 75	m2	37.7020	106,499	4,015,225
114	AK.23214	Plaster ceiling, cement mortar mark 75	m2	17.8380	179,460	3,201,207
115	AK.31130	Coat brick into wall, pole, column, brick size 300x300mm	m2	14.3420	321,813	4,615,442
116	AK.81130	Scan cement water with 2 layers	m2	41.1970	11,768	484,806
117	AK.84112	Painting 3 layers	m2	41.1970	31,056	1,279,414
118	AI.63121	Install iron frame door, aluminum frame door	m2	1.8700	98,942	185,022
IV.2		Septic tank				

No	Code	Description	Unit	Quantity	Unit Price (VND)	Amount (VND)
119	AB.11322	Digging foundation buttress, wide <= 3 m, depth <= 2 m, soil level II	m3	2.2000	228,109	501,840
120	AB.13112	Embanking foundation, tight requirement of K = 0.90	m3	0.7330	173,674	127,303
121	AF.11111	Concrete produced by mixer, cast manually, concrete lined foundation, stone 4x6, width <=250cm, mark 100	m3	0.1260	1,641,872	206,876
122	AF.81111	Framework for at-spot concrete, timber framework, long foundation framework, machine foundation	100m2	0.0070	8,983,937	62,888
123	AF.61110	Produce and install steel reinforced concrete at spot, steel reinforced foundation, diameter <= 10 mm	Tons	0.0170	19,716,844	335,186
124	AF.11213	Concrete produced by mixer, cast manually, foundation concrete, stone 1x2, width <=250cm, mark 200	m3	0.1890	2,395,125	452,679
125	AE.26114	Build brick (6,5x10,5x22), build tank, cement mortar mark 75	m3	0.4970	2,922,578	1,452,521
126	AK.21224	Plaster inside wall, thickness 1,5 cm, cement mortar mark 75	m2	5.0890	88,641	451,094
127	AK.21214	Plaster inside wall, thickness 1,0 cm, cement mortar mark 75	m2	5.0890	65,410	332,871
128	AK.41214	Glaze colored base, floor, thickness 2,0 cm, cement mortar mark 75	m2	1.1830	71,474	84,554
129	AF.81152	Framework for at-spot concrete, timber framework, lintel framework, lintel closed cornice, water gutters, plate	100m2	0.0080	14,420,979	115,368
130	AG.13221	Fabricating steel bar for lintel with steel bar D <=10mm		0.0700	21,288,936	1,490,226
131	AF.12513	Concrete produced by mixer, cast manually, lintel concrete, lintel closed cornice, water gutters, overhang, stone 1x2, mark 200	m3	0.1020	3,078,560	314,013
132	AG.42131	Install precast concrete components, install precast concrete components manually, weight <=250kg	Items	3.0000	146,115	438,345
IV.3		Electric				
133	BA.19202	Installing 1 phase aptomat, current intensity <= 50A	set	1.0000	147,886	147,886
134	BA.16205	Dragging and spreading kinds of wire, installing 2 bowels wire 2x2,5mm2	m	15.0000	29,713	445,695
135	BA.16204	Dragging and spreading kinds of wire, installing 2 bowels wire 2x1,5mm2	m	20.0000	22,075	441,500
136	BA.14302	Installing emergent plastic pipe, plastic tray to protect wire, pipe diameter <= 27mm	m	20.0000	21,150	423,000
137	BA.18102	Installing on-off system, installing switches which have 2 particles per one switch	set	1.0000	44,092	44,092
138	BA.18202	Installing on-off system, installing sockets type double socke	set	1.0000	79,028	79,028
139	AK.77631	Produce and install ceiling light box, floating, plywood covering	m2	1.0000	907,896	907,896
140	TT	Pump machine	no	1.0000	1,235,933	1,235,933
IV.4		Water supply				
141	BB.41201	Installing floor typed bowl	set	1.0000	2,269,579	2,269,579
142	BB.42501	Installing nozzle cleaning toilets	set	1.0000	203,212	203,212
143	BB.42404	Setting paper box	no	1.0000	41,565	41,565
144	BB.41401	Installing lotus fragrance bath with 1 cock, 1 lotus fragrance	set	1.0000	184,998	184,998
145	BB.42401	Installing mirror	set	1.0000	144,263	144,263
146	BB.42404	Setting soap box	no	1.0000	41,565	41,565
147	BB.19302	Installing PVC plastic pipe connected by welding method, length of pipe 6 m, diameter of pipe d=25mm	100m	0.1600	3,692,359	590,777
148	BB.19301	Installing PVC plastic pipe connected by welding method, length of pipe 6 m, diameter of pipe d=20mm	100m	0.1500	3,225,576	483,836
149	BB.30324	Installing aluminum plastic sleeve, sleeve diameter d=26mm	set	3.0000	44,859	134,577
150	BB.30323	Installing aluminum plastic sleeve, sleeve diameter d=20mm	set	3.0000	37,384	112,152
151	BB.29202	Installing plastic cudgel connecting connected by welding method, diameter of cudgel d=25mm	set	1.0000	33,378	33,378
152	BB.29222	Installing plastic phial connected by welding method, diameter of phial d=25mm	set	4.0000	34,538	138,152
153	BB.29221	Installing plastic phial connected by welding method, diameter of phial d=20mm	set	4.0000	28,929	115,716
154	BB.43101	Installing inox water tank, capacity of water tank 0,5m3	set	1.0000	2,678,959	2,678,959
Total						**386,469,472**
Round Total						**386,469,000**

Table **D**-4 Typical Cost Estimation for Construction of Silviculture Infrastructure: Forest Guard Station

Type of Infrastructure: Forestry Protection Station

Province: Hoa Binh

No	Code	Description	Unit	Quantity	Unit Price (VND)	Amount (VND)
I		Leveling works				
1	AB.11213	Digging soil for embanking or removing to waste yard or gethered ground, soil level III	m3	36.4000	202,186	7,359,570
2	AB.13112	Embanking foundation, tight requirement of K = 0.90	m3	20.0000	173,674	3,473,480
3	AB.11912	Transportation soil next 10m manually, soil level II	m3	16.4000	82,948	1,360,347
II		Construction works				
4	AB.11443	Diging foundation column, cylinder, test pit, large> 1 m, depth> 1 m, soil level III	m3	18.8600	391,412	7,382,030
5	AB.11313	Digging foundation buttress, wide <= 3 m, depth <= 1 m, soil level III	m3	2.2410	321,423	720,309
6	AF.11111	Concrete produced by mixer, cast manually, concrete lined foundation, stone 4x6, width <=250cm, mark 100	m3	2.3820	1,438,082	3,425,511
7	AF.81122	Framework for at-spot concrete, timber framework, square and rectangle column foundation framework	100m2	0.1008	15,291,021	1,541,335
8	AF.61110	Produce and install steel reinforced concrete at spot, steel reinforced foundation, diameter <= 10 mm	tấn	0.1061	18,385,756	1,950,729
9	AF.61120	Produce and install steel reinforced concrete at spot, steel reinforced foundation, diameter <= 18 mm	tấn	0.0981	17,790,324	1,745,231
10	AF.11213	Concrete produced by mixer, cast manually, foundation concrete, stone 1x2, width <=250cm, mark 200	m3	3.8377	1,770,913	6,796,233
11	AF.81132	Framework for at-spot concrete, timber framework, square, rectangle column framework	100m2	0.0936	17,002,256	1,591,411
12	AF.12213	Concrete produced by mixer, cast manually, column concrete, stone 1x2, column section <=0,1m2, height <=4m, mark 200	m3	0.5130	2,772,512	1,422,299
13	AE.81414	Build hole block (19x19x39)cm, build vertical wall, thickness <=19 cm, height <=4m, cement mortar mark 75	m3	3.4080	1,069,960	3,646,424
14	AF.81141	Framework for at-spot concrete, timber framework, beam, tie framework	100m2	0.2163	20,204,687	4,370,274
15	AF.61511	Produce and install steel reinforced concrete at spot, steel reinforced beam, tie, diameter <=10 mm, height <=4m	tấn	0.0580	19,743,450	1,145,120
16	AF.61521	Produce and install steel reinforced concrete at spot, steel reinforced beam, tie, diameter <=18 mm, height <=4m	tấn	0.2589	18,269,664	4,730,016
17	AF.12313	Concrete produced by mixer, cast manually, beam concrete, house tie, stone 1x2, mark 200	m3	1.5079	2,406,994	3,629,506
18	AB.13112	Embanking foundation, tight requirement of K = 0.90	m3	27.9905	173,674	4,861,222
19	AF.61411	Produce and install steel reinforced concrete at spot, steel reinforced column, post, diameter <=10 mm, column and post height <=4m	tấn	0.0418	19,376,206	809,925
20	AF.61421	Produce and install steel reinforced concrete at spot, steel reinforced column, post, diameter <=1 mm, column and post height <=4m	tấn	0.1735	18,277,223	3,171,098
21	AF.81132	Framework for at-spot concrete, timber framework, square, rectangle column framework	100m2	0.2932	17,002,256	4,985,061
22	AF.12213	Concrete produced by mixer, cast manually, column concrete, stone 1x2, column section <=0,1m2, height <=4m, mark 200	m3	1.2455	2,772,512	3,453,164
23	AE.71213	Build wall by 6-hole hollow brick (10x15x22), thickness >10 cm, height <=4m, cement mortar mark 50	m3	13.4275	1,225,892	16,460,665
24	AE.22114	Build brick (6,5x10,5x22), build vertical wall, thickness <=11 cm, height <=4m, cement mortar mark 75	m3	1.5598	2,057,213	3,208,841
25	AF.81141	Framework for at-spot concrete, timber framework, beam, tie framework	100m2	0.3421	20,204,687	6,912,023
26	AF.81151	Framework for at-spot concrete, timber framework, floor, roof framework	100m2	0.2669	16,027,385	4,277,709
27	AF.61511	Produce and install steel reinforced concrete at spot, steel reinforced beam, tie, diameter <=10 mm, height <=4m	tấn	0.0715	19,743,450	1,411,657
28	AF.61521	Produce and install steel reinforced concrete at spot, steel reinforced beam, tie, diameter <=18 mm, height <=4m	tấn	0.3764	18,269,664	6,876,702
29	AF.61711	Produce and install steel reinforced concrete at spot, steel reinforced camp ceiling, height <=16m, diameter <=10 mm	tấn	0.1541	19,308,625	2,975,459
30	AF.12313	Concrete produced by mixer, cast manually, beam concrete, house tie, stone 1x2, mark 200	m3	2.3457	2,406,994	5,646,086
31	AF.12413	Concrete produced by mixer, cast manually, camp ceiling concrete, stone 1x2, mark 200	m3	2.6800	2,084,304	5,585,935

No	Code	Description	Unit	Quantity	Unit Price (VND)	Amount (VND)
32	AK.82210	Cover by cement to wall	m2	26.8000	43,193	1,157,572
33	AF.61612	Produce and install steel reinforced concrete at spot, steel reinforced lintel closed cornice, water gutters, diameter <=10 mm, height <=16m	tấn	0.1299	21,407,678	2,780,857
34	AF.81152	Framework for at-spot concrete, timber framework, lintel framework, lintel closed cornice, water gutters, plate	100m2	0.2489	16,479,157	4,101,662
35	AF.12513	Concrete produced by mixer, cast manually, lintel concrete, lintel closed cornice, water gutters, overhang, stone 1x2, mark 200	m3	1.3503	2,451,550	3,310,328
36	AE.33114	Build column by brick 5x10x20, high <=4m, cement mortar mark 75	m3	0.5400	3,305,165	1,784,789
37	AE.32114	Build brick (5x10x20), build vertical wall, thickness <=10 cm, height <=4m, cement mortar mark 75	m3	0.2680	3,020,296	809,439
38	TB304	Zinc-coated Steel box 30x60x1,5 mm for purlin	md	85.5000	61,797	5,283,644
39	AK.83422	Paint kinds of iron, steel with 3 layers	m2	15.3900	39,161	602,688
40	AI.11221	Produce steel purlin	tấn	0.1510	2,827,529	426,957
41	AI.61131	Install steel purlin	tấn	0.1510	3,103,371	468,609
42	AK.12222	Roofing to cover wall by corrugated iron, at any length	100m2	0.6825	22,638,446	15,450,739
43	TT	Supporting bar 2nos/m	cái	100.8000	1,855	186,984
44	BB.19107	Installing plastic pipe form mouth bowl, by glueing method, length of pipe 6 m, diameter of pipe d=89mm	100m	0.0660	9,910,709	654,107
45	BB.24109	Installing steel cudgel by welding method, diameter of cudgel	cái	2.0000	210,869	421,738
46	BB.29105	Installing plastic cudgel type oral bowl connected by glueing method, diameter of cudgel d=89mm	cái	2.0000	41,543	83,086
47	BB.19103	Installing plastic pipe form mouth bowl, by glueing method, length of pipe 6 m, diameter of pipe d=32mm	100m	0.0120	3,107,819	37,294
48	TT	Waste Keeper	cái	2.0000	92,695	185,390
49	TT	Inox belt	cái	4.0000	9,270	37,080
50	AF.11332	Concrete produced by mixer, cast manually, base concrete, stone 4x6, mark 150	m3	4.8676	1,581,648	7,698,830
51	AB.11313	Digging foundation buttress, wide <= 3 m, depth <= 1 m, soil level III	m3	1.3365	321,423	429,582
52	AF.11111	Concrete produced by mixer, cast manually, concrete lined foundation, stone 4x6, width <=250cm, mark 100	m3	1.3365	1,438,082	1,921,997
53	AE.81414	Build hole block (19x19x39)cm, build vertical wall, thickness <=19 cm, height <=4m, cement mortar mark 75	m3	1.8360	1,069,960	1,964,447
54	AE.21114	Build brick (6,5x10,5x22), build foundation, thickness <= 33cm, cement mortar mark 75	m3	0.1084	1,674,133	181,476
55	AK.21124	Plaster outside wall, thickness 1,5 cm, cement mortar mark 75	m2	82.0900	86,920	7,135,263
56	AK.21224	Plaster inside wall, thickness 1,5 cm, cement mortar mark 75	m2	113.2951	69,064	7,824,613
57	AK.22124	Plaster pole,column, stairs, thickness 1,5 cm, cement mortar mark 75	m2	31.4760	164,711	5,184,443
58	AK.23114	Plaster beam, cement mortar mark 75	m2	34.4000	114,184	3,927,930
59	AK.23214	Plaster ceiling, cement mortar mark 75	m2	26.8000	158,769	4,255,009
60	AK.26324	Plaster granite overhang wall, Seno, sunshine curtain, thickness 1,5 cm, fine sand cement mortar mark 75	m2	18.3600	473,092	8,685,969
61	AK.26114	Plaster granite edge, scarcement, wall rail, fine sand cement mortar mark 75	m	40.0800	113,832	4,562,387
62	AK.24114	Cover single cornice, fine sand cement mortar mark 75	m	129.5500	69,711	9,031,060
63	AK.31120	Coat brick into wall, pole, column, brick size 200x300mm	m2	1.4000	276,903	387,664
64	AK.51220	Pave base, floor by brick 200x200mm	m2	0.6600	129,889	85,727
65	AK.51250	Pave base, floor by brick 400x400mm	m2	51.0095	193,673	9,879,163
66	TB304	Steel box 30x60x1,5 mmfor purlin		48.6000	61,797	3,003,334
67	AK.83422	Paint kinds of iron, steel with 3 layers	m2	8.7480	17,138	149,923
68	AI.11221	Produce steel purlin	tấn	0.1030	2,807,670	289,190
69	AI.61131	Install steel purlin	tấn	0.1030	3,103,371	319,647
70	AK.64310	Make ceiling by plastic plate + frame	m2	36.6175	105,472	3,862,121
71	TB304	Aluminum strap 25x25 around ceilling	m	44.8000	6,798	304,550
72	TB304	Wood door, windows III	m2	21.7800	1,167,956	25,438,082
73	AK.83212	Paint timber 3 layers	m2	16.2400	69,245	1,124,539
74	AH.32211	Install door without frame	m2	21.7800	118,358	2,577,837
75	TT	Steel frame for door, windows 14x14	m2	11.8800	271,906	3,230,243
76	AI.63221	Install decorating iron door	m2	11.8800	66,678	792,135
77	TT	Hooking	cái	15.0000	24,719	370,785
78	TT	Bar locks	cái	16.0000	27,809	444,944
79	TT	Viet Tiep Lock door	bộ	4.0000	92,695	370,780
80	AK.92111	Scan Flinkote to waterproof roof,seno, overhang	m2	4.3200	34,118	147,390
81	AK.84422	Paint beam, ceiling, column, wall inside house without baits by Ici Dulux, 1 layer to line, 2 layers to cover	m2	179.1710	43,363	7,769,392

No	Code	Description	Unit	Quantity	Unit Price (VND)	Amount (VND)
82	AK.84422	Paint beam, ceiling, column, wall inside house without baits by Ici Dulux, 1 layer to line, 2 layers to cover	m2	82.0900	43,363	3,559,669
83	AL.61110	Install construction steel scaffold, outside scaffold, height <=16m	100m2	1.5768	2,447,343	3,858,970
III		Lighting system				
84	BA.18202	Installing on-off system, installing sockets type double socket	cái	7.0000	90,332	632,324
85	BA.18101	Installing on-off system, installing switches which have 1 particle per one switch	cái	3.0000	55,612	166,836
86	BA.18102	Installing on-off system, installing switches which have 2 particles per one switch	cái	1.0000	71,108	71,108
87	BA.15403	Installing joint, wire division box, switch box, fuse box, automat box, size <=60x60mm	hộp	12.0000	66,773	801,276
88	BA.14402	Installing submersible plastic pipe, plastic tray to protect wire, pipe diameter <= 27mm	m	72.0000	58,325	4,199,400
89	BA.19202	Installing 1 phase aptomat, current intensity <= 50A	cái	1.0000	107,149	107,149
90	BA.16206	Dragging and spreading kinds of wire, installing 2 bowels wire 2x4mm2	m	20.0000	33,821	676,420
91	BA.16205	Dragging and spreading kinds of wire, installing 2 bowels wire 2x2,5mm2	m	22.0000	27,911	614,042
92	BA.16204	Dragging and spreading kinds of wire, installing 2 bowels wire 2x1,5mm2	m	50.0000	19,724	986,200
93	TT	Isolated Sticking Plaster	cuộn	2.0000	18,539	37,078
IV		Toilet				
IV.1		Construction works				
94	AB.11312	Digging foundation buttress, wide <= 3 m, depth <= 1 m, soil level II	m3	7.3510	212,555	1,562,492
95	AB.13112	Embanking foundation, tight requirement of K = 0.90	m3	2.4500	173,674	425,501
96	AF.11111	Concrete produced by mixer, cast manually, concrete lined foundation, stone 4x6, width <=250cm, mark 100	m3	0.7350	1,438,082	1,056,990
97	AE.21114	Build brick (6,5x10,5x22), build foundation, thickness <= 33cm, cement mortar mark 75	m3	3.5830	1,674,133	5,998,419
98	AF.12313	Concrete produced by mixer, cast manually, beam concrete, house tie, stone 1x2, mark 200	m3	0.2550	2,406,994	613,783
99	AF.81141	Framework for at-spot concrete, timber framework, beam, tie framework	100m2	0.0230	20,204,687	464,708
100	AF.61511	Produce and install steel reinforced concrete at spot, steel reinforced beam, tie, diameter <=10 mm, height <=4m	tấn	0.0330	19,743,450	651,534
101	AE.22214	Build brick (6,5x10,5x22), build vertical wall, thickness <= 33cm, height <=4m, cement mortar mark 75	m3	3.6650	1,813,221	6,645,455
102	AF.12313	Concrete produced by mixer, cast manually, beam concrete, house tie, stone 1x2, mark 200	m3	0.3400	2,406,994	818,378
103	AF.81141	Framework for at-spot concrete, timber framework, beam, tie framework	100m2	0.0310	20,204,687	626,345
104	AF.61511	Produce and install steel reinforced concrete at spot, steel reinforced beam, tie, diameter <=10 mm, height <=4m	tấn	0.0700	19,743,450	1,382,042
105	AF.12413	Concrete produced by mixer, cast manually, camp ceiling concrete, stone 1x2, mark 200	m3	1.4070	2,084,304	2,932,616
106	AF.81151	Framework for at-spot concrete, timber framework, floor, roof framework	100m2	0.1900	16,027,385	3,045,203
107	AF.61711	Produce and install steel reinforced concrete at spot, steel reinforced camp ceiling, height <=16m, diameter <=10 mm	tấn	0.0280	19,308,625	540,642
108	AK.41124	Glaze colorless base, floor, thickness 3,0 cm, cement mortar mark 75	m2	8.5800	66,957	574,491
109	AF.11111	Concrete produced by mixer, cast manually, concrete lined foundation, stone 4x6, width <=250cm, mark 100	m3	0.2800	1,438,082	402,663
110	AE.21114	Build brick (6,5x10,5x22), build foundation, thickness <= 33cm, cement mortar mark 75	m3	0.0490	1,674,133	82,033
111	AK.41123	Glaze colorless base, floor, thickness 3,0 cm, cement mortar mark 50	m2	3.2920	55,791	183,664
112	AK.51240	Pave base, floor by brick 300x300mm	m2	3.4460	153,188	527,886
113	AK.21124	Plaster outside wall, thickness 1,5 cm, cement mortar mark 75	m2	37.7020	86,920	3,277,058
114	AK.23214	Plaster ceiling, cement mortar mark 75	m2	17.8380	158,769	2,832,121
115	AK.31130	Coat brick into wall, pole, column, brick size 300x300mm	m2	14.3420	267,968	3,843,197
116	AK.81130	Scan cement water with 2 layers	m2	41.1970	11,143	459,058
117	SB.83320	Painting 3 layers	m2	14.3420	66,892	959,365
118	AI.63121	Install iron frame door, aluminum frame door	m2	1.8700	96,361	180,195
IV.2		Septic tank				
119	AB.11322	Digging foundation buttress, wide <= 3 m, depth <= 2 m, soil level II	m3	2.2000	228,109	501,840
120	AB.13112	Embanking foundation, tight requirement of K = 0.90	m3	0.7330	173,674	127,303
121	AF.11111	Concrete produced by mixer, cast manually, concrete lined foundation, stone 4x6, width <=250cm, mark 100	m3	0.1260	1,438,082	181,198

No	Code	Description	Unit	Quantity	Unit Price (VND)	Amount (VND)
122	AF.81111	Framework for at-spot concrete, timber framework, long foundation framework, machine foundation	100m2	0.0070	10,738,626	75,170
123	AF.61110	Produce and install steel reinforced concrete at spot, steel reinforced foundation, diameter <= 10 mm	tấn	0.0170	18,385,756	312,558
124	AF.11213	Concrete produced by mixer, cast manually, foundation concrete, stone 1x2, width <=250cm, mark 200	m3	0.1890	1,770,913	334,703
125	AE.26114	Build brick (6,5x10,5x22), build tank, cement mortar mark 75	m3	0.4970	2,300,880	1,143,537
126	AK.21224	Plaster inside wall, thickness 1,5 cm, cement mortar mark 75	m2	5.0890	69,064	351,467
127	AK.21214	Plaster inside wall, thickness 1,0 cm, cement mortar mark 75	m2	0.4970	51,594	25,642
128	AK.41214	Glaze colored base, floor, thickness 2,0 cm, cement mortar mark 75	m2	1.1830	52,973	62,667
129	AF.81152	Framework for at-spot concrete, timber framework, lintel framework, lintel closed cornice, water gutters, plate	100m2	0.0080	16,479,157	131,833
130	SB.21961	Fabricating steel bar for lintel with steel bar D <=10mm	100kg	0.0700	2,777,196	194,404
131	AF.12513	Concrete produced by mixer, cast manually, lintel concrete, lintel closed cornice, water gutters, overhang, stone 1x2, mark 200	m3	0.1020	2,451,550	250,058
132	AG.42131	Install precast concrete components, install precast concrete components manually, weight <=250kg	cái	3.0000	141,931	425,793
IV.3		Electric				
133	BA.19202	Installing 1 phase aptomat, current intensity <= 50A	cái	1.0000	107,149	107,149
134	BA.16205	Dragging and spreading kinds of wire, installing 2 bowels wire 2x2,5mm2	m	15.0000	27,911	418,665
135	BA.16204	Dragging and spreading kinds of wire, installing 2 bowels wire 2x1,5mm2	m	20.0000	19,724	394,480
136	BA.14302	Installing emergent plastic pipe, plastic tray to protect wire, pipe diameter <= 27mm	m	20.0000	21,848	436,960
137	BA.18102	Installing on-off system, installing switches which have 2 particles per one switch	cái	1.0000	71,108	71,108
138	BA.18202	Installing on-off system, installing sockets type double socket	cái	1.0000	90,332	90,332
139	AK.77631	Produce and install ceiling light box, floating, plywood covering	m2	1.0000	1,003,345	1,003,345
140	TT	Pump machine		1.0000	1,235,933	1,235,933
IV.4		Water supply				
141	BB.41201	Installing floor typed bowl	bộ	1.0000	2,595,451	2,595,451
142	BB.42501	Installing nozzle cleaning toilets	cái	1.0000	145,002	145,002
143	BB.42404	Setting paper box	cái	1.0000	102,898	102,898
144	BB.41401	Installing lotus fragrance bath with 1 cock, 1 lotus fragrance	bộ	1.0000	189,941	189,941
145	BB.42401	Installing mirror	cái	1.0000	267,150	267,150
146	BB.42404	Setting soap box	cái	1.0000	102,898	102,898
147	BB.19302	Installing PVC plastic pipe connected by welding method, length of pipe 6 m, diameter of pipe d=25mm	100m	0.1600	3,653,126	584,500
148	BB.19301	Installing PVC plastic pipe connected by welding method, length of pipe 6 m, diameter of pipe d=20mm	100m	0.1500	3,183,767	477,565
149	BB.30304	Installing aluminum plastic sleeve, sleeve diameter d=26mm	cái	3.0000	46,307	138,921
150	BB.30303	Installing aluminum plastic sleeve, sleeve diameter d=20mm	cái	3.0000	38,588	115,764
151	BB.29202	Installing plastic cudgel connecting connected by welding method, diameter of cudgel d=25mm	cái	1.0000	31,001	31,001
152	BB.29202	Installing plastic phial connected by welding method, diameter of phial d=25mm	cái	4.0000	31,001	124,004
153	BB.29201	Installing plastic phial connected by welding method, diameter of phial d=20mm	cái	4.0000	26,228	104,912
154	BB.43101	Installing inox water tank, capacity of water tank 0,5m3	bể	1.0000	2,872,084	2,872,084
Total						359,583,334
Round Total						359,583,000

Table D-5: Typical Cost Estimation for Construction of Silviculture Infrastructure: Information Board

Type of Infrastructure Information Board

Province: Dien Dien

No	Code	Description	Unit	Quantity	Unit Price (VND)	Amount (VND)
1	AB.11313	Digging foundation buttress, wide <= 3 m, depth <= 1 m, soil level III	m3	1.4280	316,897	452,529
2	AB.13123	Embanking pipe foundation, sewer, tight requirement of K = 0.95	m3	0.4760	189,116	90,019
3	AB.11913	Transportation soil next 10m manually, soil level III	m3	0.9520	8,944	8,515
4	AF.11111	Concrete produced by mixer, cast manually, concrete lined foundation, stone 4x6, width <=250cm, mark 100	m3	0.2380	1,459,142	347,276
5	AF.11213	Concrete produced by mixer, cast manually, foundation concrete, stone 1x2, width <=250cm, mark 200	m3	0.5210	1,812,854	944,497
6	AF.81122	Framework for at-spot concrete, timber framework, square and rectangle column foundation framework	100m2	0.0317	14,011,185	444,155
7	AE.21214	Build brick (6,5x10,5x22), build foundation, thickness > 33cm, cement mortar mark 75	m3	0.5400	2,089,223	1,128,180
8	AF.12313	Concrete produced by mixer, cast manually, beam concrete, house tie, stone 1x2, mark 200	m3	0.1360	2,449,329	333,109
9	AF.81141	Framework for at-spot concrete, timber framework, beam, tie framework	100m2	0.0068	18,391,756	125,064
10	AF.61511	Produce and install steel reinforced concrete at spot, steel reinforced beam, tie, diameter <=10 mm, height <=4m	Tons	0.0076	19,298,770	146,671
11	AF.12213	Concrete produced by mixer, cast manually, column concrete, stone 1x2, column section <=0,1m2, height <=4m, mark 200	m3	0.2130	2,739,370	583,486
12	AF.81132	Framework for at-spot concrete, timber framework, square, rectangle column framework	100m2	0.0387	15,623,301	604,622
13	AF.61411	Produce and install steel reinforced concrete at spot, steel reinforced column, post, diameter <=10 mm, column and post height <=4m	Tons	0.0088	18,936,697	166,643
14	AE.22314	Build brick (6,5x10,5x22), build vertical wall, thickness > 33cm, height <=4m, cement mortar mark 75	m3	0.7540	2,222,127	1,675,484
15	AE.22114	Build brick (6,5x10,5x22), build vertical wall, thickness <=11 cm, height <=4m, cement mortar mark 75	m3	0.4790	2,626,012	1,257,860
16	AF.12513	Concrete produced by mixer, cast manually, lintel concrete, lintel closed cornice, water gutters, overhang, stone 1x2, mark 200	m3	0.2380	2,489,057	592,396
17	AF.81152	Framework for at-spot concrete, timber framework, lintel framework, lintel closed cornice, water gutters, plate	100m2	0.2074	15,002,010	3,111,417
18	AF.61611	Produce and install steel reinforced concrete at spot, steel reinforced lintel closed cornice, water gutters, diameter <=10 mm, height <=4m	Tons	0.0221	20,812,890	459,965
19	AK.21124	Plaster outside wall, thickness 1,5 cm, cement mortar mark 75	m2	8.7090	94,637	824,194
20	AK.21134	Plaster outside wall, thickness 2,0 cm, cement mortar mark 75	m2	6.5090	118,395	770,633
21	AK.22124	Plaster pole,column, stairs, thickness 1,5 cm, cement mortar mark 75	m2	25.2920	171,840	4,346,177
22	AK.24114	Cover single cornice, fine sand cement mortar mark 75	m	17.7320	74,478	1,320,644
23	TT	Writing text on board	set	1.0000	2,437,050	2,437,050
24	AK.84424	Paint wall outside house without baits by Ici Dulux, 1 layer to line, 2 layers to cover	m2	40.5100	55,245	2,237,975
Total						24,408,561
Round Total						24,409,000

Table **D**-5: Typical Cost Estimation for Construction of Silviculture Infrastructure: Information Board

Type of Infrastructure: Information Board

Province: Lai Chau

No	Code	Description	Unit	Quantity	Unit Price (VND)	Amount (VND)
1	AB.11313	Digging foundation buttress, wide <= 3 m, depth <= 1 m, soil level III	m3	1.4280	316,897	452,529
2	AB.13123	Embanking pipe foundation, sewer, tight requirement of K = 0.95	m3	0.4760	189,116	90,019
3	AB.11913	Transportation soil next 10m manually, soil level III	m3	0.9520	8,944	8,515
4	AF.11111	Concrete produced by mixer, cast manually, concrete lined foundation, stone 4x6, width <=250cm, mark 100	m3	0.2380	1,621,026	385,804
5	AF.11213	Concrete produced by mixer, cast manually, foundation concrete, stone 1x2, width <=250cm, mark 200	m3	0.5210	2,042,739	1,064,267
6	AF.81122	Framework for at-spot concrete, timber framework, square and rectangle column foundation framework	100m2	0.0317	14,343,502	454,689
7	AE.21214	Build brick (6,5x10,5x22), build foundation, thickness > 33cm, cement mortar mark 75	m3	0.5400	1,756,137	948,314
8	AF.12313	Concrete produced by mixer, cast manually, beam concrete, house tie, stone 1x2, mark 200	m3	0.1360	2,673,331	363,573
9	AF.81141	Framework for at-spot concrete, timber framework, beam, tie framework	100m2	0.0068	18,873,454	128,339
10	AF.61511	Produce and install steel reinforced concrete at spot, steel reinforced beam, tie, diameter <=10 mm, height <=4m	Tons	0.0076	20,561,164	156,265
11	AF.12213	Concrete produced by mixer, cast manually, column concrete, stone 1x2, column section <=0,1m2, height <=4m, mark 200	m3	0.2130	2,970,847	632,790
12	AF.81132	Framework for at-spot concrete, timber framework, square, rectangle column framework	100m2	0.0387	15,980,471	618,444
13	AF.61411	Produce and install steel reinforced concrete at spot, steel reinforced column, post, diameter <=10 mm, column and post height <=4m	Tons	0.0088	20,199,090	177,752
14	AE.22314	Build brick (6,5x10,5x22), build vertical wall, thickness > 33cm, height <=4m, cement mortar mark 75	m3	0.7540	1,872,984	1,412,230
15	AE.22114	Build brick (6,5x10,5x22), build vertical wall, thickness <=11 cm, height <=4m, cement mortar mark 75	m3	0.4790	2,149,028	1,029,384
16	AF.12513	Concrete produced by mixer, cast manually, lintel concrete, lintel closed cornice, water gutters, overhang, stone 1x2, mark 200	m3	0.2380	2,715,709	646,339
17	AF.81152	Framework for at-spot concrete, timber framework, lintel framework, lintel closed cornice, water gutters, plate	100m2	0.2074	15,392,736	3,192,453
18	AF.61611	Produce and install steel reinforced concrete at spot, steel reinforced lintel closed cornice, water gutters, diameter <=10 mm, height <=4m	Tons	0.0221	22,075,283	487,864
19	AK.21124	Plaster outside wall, thickness 1,5 cm, cement mortar mark 75	m2	8.7090	101,191	881,272
20	AK.21134	Plaster outside wall, thickness 2,0 cm, cement mortar mark 75	m2	6.5090	127,292	828,544
21	AK.22124	Plaster pole,column, stairs, thickness 1,5 cm, cement mortar mark 75	m2	25.2920	178,772	4,521,501
22	AK.24114	Cover single cornice, fine sand cement mortar mark 75	m	17.7320	78,128	1,385,366
23	TT	Writing text on board	set	1.0000	2,437,050	2,437,050
24	AK.84424	Paint wall outside house without baits by Ici Dulux, 1 layer to line, 2 layers to cover	m2	40.5100	56,519	2,289,585
Total						24,592,888
Round Total						24,593,000

Table **D**-5: Typical Cost Estimation for Construction of Silviculture Infrastructure: Information Board

Type of Infrastr Information Board

Province: Son La

No	Code	Description	Unit	Quantity	Unit Price (VND)	Amount (VND)
1	AB.11313	Digging foundation buttress, wide <= 3 m, depth <= 1 m, soil level	m3	1.4280	316,898	452,530
2	AB.13123	Embanking pipe foundation, sewer, tight requirement of K = 0.95	m3	0.4760	189,116	90,019
3	AB.11913	Transportation soil next 10m manually, soil level III	m3	0.9520	8,945	8,516
4	AF.11111	Concrete produced by mixer, cast manually, concrete lined foundation, stone 4x6, width <=250cm, mark 100	m3	0.2380	1,752,265	417,039
5	AF.11213	Concrete produced by mixer, cast manually, foundation concrete, stone 1x2, width <=250cm, mark 200	m3	0.5210	2,134,499	1,112,074
6	AF.81122	Framework for at-spot concrete, timber framework, square and rectangle column foundation framework	100m2	0.0317	13,263,348	420,448
7	AE.21214	Build brick (6,5x10,5x22), build foundation, thickness > 33cm, cement mortar mark 75	m3	0.5400	2,051,557	1,107,841
8	AF.12313	Concrete produced by mixer, cast manually, beam concrete, house tie, stone 1x2, mark 200	m3	0.1360	2,760,177	375,384
9	AF.81141	Framework for at-spot concrete, timber framework, beam, tie framework	100m2	0.0068	17,311,606	117,719
10	AF.61511	Produce and install steel reinforced concrete at spot, steel reinforced beam, tie, diameter <=10 mm, height <=4m	Tons	0.0076	20,654,902	156,977
11	AF.12213	Concrete produced by mixer, cast manually, column concrete, stone 1x2, column section <=0,1m2, height <=4m, mark 200	m3	0.2130	3,039,150	647,339
12	AF.81132	Framework for at-spot concrete, timber framework, square, rectangle column framework	100m2	0.0387	14,820,109	573,538
13	AF.61411	Produce and install steel reinforced concrete at spot, steel reinforced column, post, diameter <=10 mm, column and post height <=4m	Tons	0.0088	20,292,831	178,577
14	AE.22314	Build brick (6,5x10,5x22), build vertical wall, thickness > 33cm, height <=4m, cement mortar mark 75	m3	0.7540	2,178,519	1,642,603
15	AE.22114	Build brick (6,5x10,5x22), build vertical wall, thickness <=11 cm, height <=4m, cement mortar mark 75	m3	0.4790	2,539,428	1,216,386
16	AF.12513	Concrete produced by mixer, cast manually, lintel concrete, lintel closed cornice, water gutters, overhang, stone 1x2, mark 200	m3	0.2380	2,810,674	668,940
17	AF.81152	Framework for at-spot concrete, timber framework, lintel framework, lintel closed cornice, water gutters, plate	100m2	0.2074	14,127,681	2,930,081
18	AF.61611	Produce and install steel reinforced concrete at spot, steel reinforced lintel closed cornice, water gutters, diameter <=10 mm, height <=4m	Tons	0.0221	22,169,024	489,935
19	AK.21124	Plaster outside wall, thickness 1,5 cm, cement mortar mark 75	m2	8.7090	102,332	891,209
20	AK.21134	Plaster outside wall, thickness 2,0 cm, cement mortar mark 75	m2	6.5090	128,929	839,199
21	AK.22124	Plaster pole,column, stairs, thickness 1,5 cm, cement mortar mark 75	m2	25.2920	179,990	4,552,307
22	AK.24114	Cover single cornice, fine sand cement mortar mark 75	m	17.7320	79,754	1,414,198
23	TT	Writing text on board	set	1.0000	2,437,050	2,437,050
24	AK.84424	Paint wall outside house without baits by Ici Dulux, 1 layer to line, 2 layers to cover	m2	40.5100	55,283	2,239,514
Total						**24,979,423**
Round Total						**24,979,000**

Table **D**-5: Typical Cost Estimation for Construction of Silviculture Infrastructure: Information Board

Type of Infrastructure Information Board

Province: Hoa Binh

No	Code	Description	Unit	Quantity	Unit Price (VND)	Amount (VND)
1	AB.11313	Digging foundation buttress, wide <= 3 m, depth <= 1 m, soil level III	m3	1.4280	316,897	452,529
2	AB.13123	Embanking pipe foundation, sewer, tight requirement of K = 0.95	m3	0.4760	189,116	90,019
3	AB.11913	Transportation soil next 10m manually, soil level III	m3	0.9520	8,944	8,515
4	AF.11111	Concrete produced by mixer, cast manually, concrete lined foundation, stone 4x6, width <=250cm, mark 100	m3	0.2380	1,287,017	306,310
5	AF.11213	Concrete produced by mixer, cast manually, foundation concrete, stone 1x2, width <=250cm, mark 200	m3	0.5210	1,605,863	836,655
6	AF.81122	Framework for at-spot concrete, timber framework, square and rectangle column foundation framework	100m2	0.0317	15,022,884	476,225
7	AE.21214	Build brick (6,5x10,5x22), build foundation, thickness > 33cm, cement mortar mark 75	m3	0.5400	1,502,389	811,290
8	AF.12313	Concrete produced by mixer, cast manually, beam concrete, house tie, stone 1x2, mark 200	m3	0.1360	2,232,986	303,686
9	AF.81141	Framework for at-spot concrete, timber framework, beam, tie framework	100m2	0.0068	19,844,677	134,944
10	AF.61511	Produce and install steel reinforced concrete at spot, steel reinforced beam, tie, diameter <=10 mm, height <=4m	Tons	0.0076	19,464,199	147,928
11	AF.12213	Concrete produced by mixer, cast manually, column concrete, stone 1x2, column section <=0,1m2, height <=4m, mark 200	m3	0.2130	2,543,586	541,784
12	AF.81132	Framework for at-spot concrete, timber framework, square, rectangle column framework	100m2	0.0387	16,706,229	646,531
13	AF.61411	Produce and install steel reinforced concrete at spot, steel reinforced column, post, diameter <=10 mm, column and post height <=4m	Tons	0.0088	19,102,127	168,099
14	AE.22314	Build brick (6,5x10,5x22), build vertical wall, thickness > 33cm, height <=4m, cement mortar mark 75	m3	0.7540	1,607,167	1,211,804
15	AE.22114	Build brick (6,5x10,5x22), build vertical wall, thickness <=11 cm, height <=4m, cement mortar mark 75	m3	0.4790	1,929,860	924,403
16	AF.12513	Concrete produced by mixer, cast manually, lintel concrete, lintel closed cornice, water gutters, overhang, stone 1x2, mark 200	m3	0.2380	2,276,914	541,906
17	AF.81152	Framework for at-spot concrete, timber framework, lintel framework, lintel closed cornice, water gutters, plate	100m2	0.2074	16,186,366	3,357,052
18	AF.61611	Produce and install steel reinforced concrete at spot, steel reinforced lintel closed cornice, water gutters, diameter <=10 mm, height <=4m	Tons	0.0221	20,978,319	463,621
19	AK.21124	Plaster outside wall, thickness 1,5 cm, cement mortar mark 75	m2	8.7090	85,734	746,657
20	AK.21134	Plaster outside wall, thickness 2,0 cm, cement mortar mark 75	m2	6.5090	106,405	692,590
21	AK.22124	Plaster pole,column, stairs, thickness 1,5 cm, cement mortar mark 75	m2	25.2920	162,432	4,108,230
22	AK.24114	Cover single cornice, fine sand cement mortar mark 75	m	17.7320	68,752	1,219,110
23	TT	Writing text on board	set	1.0000	2,437,050	2,437,050
24	AK.84424	Paint wall outside house without baits by Ici Dulux, 1 layer to line, 2 layers to cover	m2	40.5100	53,584	2,170,688
Total						22,797,626
Round Total						22,798,000

TableD-6 Typical Cost Estimation for Construction of Silviculture Infrastructure: Nursery

Type of Infrastructure: Nursery
Province: Dien Dien

No	Code	Description	Unit	Quantity	Unit Price (VND)	Amount (VND)
I		Making tree beds				
1	AB.11312	Digging foundation buttress, wide <= 3 m, depth <= 1 m, soil level II	m3	24.84	209,561.	5,205,495.2
2	AE.32114	Build Brick Wall 5x10x20, wall thickness <=10 cm, high <=4 m, mortar mark 75	m3	37.26	2,024,327.	75,426,424.
II		Irrigation system				
3	AB.11313	Digging foundation buttress, wide <= 3 m, depth <= 1 m, soil level III	m3	31.95	316,898.	10,124,891.1
4	AB.13412	Embanking pipe foundation, sewer with sand	m3	31.95	330,186.	10,549,442.7
5	BB.19101	Installing plastic pipe form mouth bowl, by glueing method, length of pipe 6 m, diameter of pipe d=20mm	100m	1.3	1,933,363.	2,513,371.9
6	BB.19102	Installing plastic pipe form mouth bowl, by glueing method, length of pipe 6 m, diameter of pipe d=25mm	100m	1.25	2,405,237.	3,006,546.3
7	BB.19104	Installing plastic pipe form mouth bowl, by glueing method, length of pipe 6 m, diameter of pipe d=40mm	100m	1.	3,936,798.	3,936,798.
8	BB.29121	Installing plastic phial type oral bowl connected by glueing method, diameter of phial d=32mm	set	22.	24,395.	536,690.
9	TT	Plastic Sleeve D=27	no	15.	4,265.	63,975.
10	TT	T Connector D=27-21	no	35.	8,529.	298,515.
11	TT	T Connector D=42-27	no	8.	43,867.	350,936.
12	BB.29122	Installing plastic phial type oral bowl connected by glueing method, diameter of phial d=40mm	set	15.	34,342.	515,130.
13	TT	Plastic Sleeve D=42	no	20.	10,358.	207,160.
14	TT	Pump Machine EBARA CMA 150m	no	1.	15,840,825.	15,840,825.
15	TT	Pump Machine PANASONIC A-130JAK	no	1.	1,883,840.	1,883,840.
16	TT	Spay Header Radius 4m	no	51.	290,010.	14,790,510.
17	BA.18401	Installing breakers having 3 poles, one-dimension, type <= 60A	set	1.	184,324.	184,324.
18	BA.19201	Installing 1 phase aptomat, current intensity <= 10A	set	2.	435,413.	870,826.
19	BA.16206	Dragging and spreading kinds of wire, installing 2 bowels wire 2x4mm2	m	40.	42,237.	1,689,480.
III		Roof Cover				
20	AB.11413	Diging foundation column, cylinder, test pit, wide <= 1 m, depth <= 1 m, soil level III	m3	18.9734	485,569.	9,212,894.9
21	AF.11232	Concrete produced by mixer, cast manually, foundation concrete, stone 2x4, width <=250cm, mark 150	m3	15.552	1,493,227.	23,222,666.3
22	BB.14301	Installing zinc coated steel pipe connected by sleeve method, length of pipe 8 m, diameter of pipe d=25mm	100m	4.41	11,651,972.	51,385,196.5
23	BB.14301	Installing zinc coated steel pipe connected by sleeve method, length of pipe 8 m, diameter of pipe d=25mm	100m	1.44	11,651,972.	16,778,839.7
24	BB.14303	Installing zinc coated steel pipe connected by sleeve method, length of pipe 8 m, diameter of pipe d=40mm	100m	1.44	16,783,449.	24,168,166.6
25	BB.14304	Installing zinc coated steel pipe connected by sleeve method, length of pipe 8 m, diameter of pipe d=50mm	100m	0.36	20,267,503.	7,296,301.1
26	TT	Steel Plate 20*20*0.1 cm	no	72.	36,556.	2,632,032.
27	TT	Sun Protection Cover sheet	m2	429.	57,136.	24,511,344.
28	TT	Labour for making tree beds	labour	19.2	202,276.	3,883,699.2
29	TT	Bolt	no	96.	18,278.	1,754,688.
30	TT	Lock D42	no	3.	19,496.	58,488.
TOTAL						312,899,497
ROUND TOTAL						312,899,000

Table**D**-6 Typical Cost Estimation for Construction of Silviculture Infrastructure: Nursery

Type of Infrastructure: Nursery
Province: Lai Chau

No	Code	Description	Unit	Quantity	Unit Price (VND)	Amount (VND)
I		Making tree beds				
1	AB.11312	Digging foundation buttress, wide <= 3 m, depth <= 1 m, soil level II	m3	24.84	209,561.	5,205,495.2
2	AE.32114	Build Brick Wall 5x10x20, wall thickness <=10 cm, high <=4 m, mortar mark 75	m3	37.26	2,768,053.	103,137,654.8
II		Irrigation system				
3	AB.11313	Digging foundation buttress, wide <= 3 m, depth <= 1 m, soil level III	m3	31.95	316,898.	10,124,891.1
4	AB.13412	Embanking pipe foundation, sewer with sand	m3	31.95	694,159.	22,178,380.1
5	BB.19101	Installing plastic pipe form mouth bowl, by glueing method, length of pipe 6 m, diameter of pipe d=20mm	100m	1.3	1,361,375.	1,769,787.5
6	BB.19102	Installing plastic pipe form mouth bowl, by glueing method, length of pipe 6 m, diameter of pipe d=25mm	100m	1.25	1,739,431.	2,174,288.8
7	BB.19104	Installing plastic pipe form mouth bowl, by glueing method, length of pipe 6 m, diameter of pipe d=40mm	100m	1.	2,935,063.	2,935,063.
8	BB.29121	Installing plastic phial type oral bowl connected by glueing method, diameter of phial d=32mm	set	22.	24,395.	536,690.
9	TT	Plastic Sleeve D=27	no	15.	4,265.	63,975.
10	TT	T Connector D=27-21	no	35.	8,529.	298,515.
11	TT	T Connector D=42-27	no	8.	43,867.	350,936.
12	BB.29122	Installing plastic phial type oral bowl connected by glueing method, diameter of phial d=40mm	set	15.	34,342.	515,130.
13	TT	Plastic Sleeve D=42	no	20.	10,358.	207,160.
14	TT	Pump Machine EBARA CMA 150m	no	1.	15,840,825.	15,840,825.
15	TT	Pump Machine PANASONIC A-130JAK	no	1.	1,883,840.	1,883,840.
16	TT	Spay Header Radius 4m	no	51.	290,010.	14,790,510.
17	BA.18401	Installing breakers having 3 poles, one-dimension, type <= 60A	set	1.	288,732.	288,732.
18	BA.19201	Installing 1 phase aptomat, current intensity <= 10A	set	2.	142,044.	284,088.
19	BA.16206	Dragging and spreading kinds of wire, installing 2 bowels wire 2x4mm2	m	40.	40,118.	1,604,720.
III		Roof Cover				
20	AB.11413	Diging foundation column, cylinder, test pit, wide <= 1 m, depth <= 1 m, soil level III	m3	18.9734	485,569.	9,212,894.9
21	AF.11232	Concrete produced by mixer, cast manually, foundation concrete, stone 2x4, width <=250cm, mark 150	m3	15.552	1,699,434.	26,429,597.6
22	BB.14301	Installing zinc coated steel pipe connected by sleeve method, length of pipe 8 m, diameter of pipe d=25mm	100m	4.41	8,244,258.	36,357,177.8
23	BB.14301	Installing zinc coated steel pipe connected by sleeve method, length of pipe 8 m, diameter of pipe d=25mm	100m	1.44	8,244,258.	11,871,731.5
24	BB.14303	Installing zinc coated steel pipe connected by sleeve method, length of pipe 8 m, diameter of pipe d=40mm	100m	1.44	12,183,337.	17,544,005.3
25	BB.14304	Installing zinc coated steel pipe connected by sleeve method, length of pipe 8 m, diameter of pipe d=50mm	100m	0.36	15,243,696.	5,487,730.6
26	TT	Steel Plate 20*20*0.1 cm	no	72.	36,556.	2,632,032.
27	TT	Sun Protection Cover sheet	m2	429.	57,136.	24,511,344.
28	TT	Labour for making tree beds	labour	19.2	202,276.	3,883,699.2
29	TT	Bolt	no	96.	18,278.	1,754,688.
30	TT	Lock D42	no	3.	19,496.	58,488.
TOTAL						**323,934,070**
ROUND TOTAL						**323,934,000**

TableD-6 Typical Cost Estimation for Construction of Silviculture Infrastructure: Nursery

Type of Infrastructure: Nursery
Province: Son La

No	Code	Description	Unit	Quantity	Unit Price (VND)	Amount (VND)
I		SON LA-NURSERY 1000m2				
1	AB.11312	Digging foundation buttress, wide <= 3 m, depth <= 1 m, soil level II	m3	24.84	209,561.	5,205,495.2
2	AE.32114	Build Brick Wall 5x10x20, wall thickness <=10 cm, high <=4 m, mortar mark 75	m3	37.26	2,564,287.	95,545,333.6
II		Irrigation system				
3	AB.11313	Digging foundation buttress, wide <= 3 m, depth <= 1 m, soil level III	m3	31.95	316,898.	10,124,891.1
4	AB.13412	Embanking pipe foundation, sewer with sand	m3	31.95	847,738.	27,085,229.1
5	BB.19101	Installing plastic pipe form mouth bowl, by glueing method, length of pipe 6 m, diameter of pipe d=20mm	100m	1.3	1,361,375.	1,769,787.5
6	BB.19102	Installing plastic pipe form mouth bowl, by glueing method, length of pipe 6 m, diameter of pipe d=25mm	100m	1.25	1,739,431.	2,174,288.8
7	BB.19104	Installing plastic pipe form mouth bowl, by glueing method, length of pipe 6 m, diameter of pipe d=40mm	100m	1.	2,935,063.	2,935,063.
8	BB.29121	Installing plastic phial type oral bowl connected by glueing method, diameter of phial d=32mm	set	22.	24,395.	536,690.
9	TT	Plastic Sleeve D=27	no	15.	4,265.	63,975.
10	TT	T Connector D=27-21	no	35.	8,529.	298,515.
11	TT	T Connector D=42-27	no	8.	43,867.	350,936.
12	BB.29122	Installing plastic phial type oral bowl connected by glueing method, diameter of phial d=40mm	set	15.	34,342.	515,130.
13	TT	Plastic Sleeve D=42	no	20.	10,358.	207,160.
14	TT	Pump Machine EBARA CMA 150m	no	1.	15,840,825.	15,840,825.
15	TT	Pump Machine PANASONIC A-130JAK	no	1.	1,883,840.	1,883,840.
16	TT	Spay Header Radius 4m	no	51.	290,010.	14,790,510.
17	BA.18401	Installing breakers having 3 poles, one-dimension, type <= 60A	set	1.	151,136.	151,136.
18	BA.19201	Installing 1 phase aptomat, current intensity <= 10A	set	2.	87,958.	175,916.
19	BA.16206	Dragging and spreading kinds of wire, installing 2 bowels wire 2x4mm2	m	40.	40,118.	1,604,720.
III		Roof Cover				
20	AB.11413	Diging foundation column, cylinder, test pit, wide <= 1 m, depth <= 1 m, soil level III	m3	18.9734	485,569.	9,212,894.9
21	AF.11232	Concrete produced by mixer, cast manually, foundation concrete, stone 2x4, width <=250cm, mark 150	m3	15.552	1,797,864.	27,960,380.9
22	BB.14301	Installing zinc coated steel pipe connected by sleeve method, length of pipe 8 m, diameter of pipe d=25mm	100m	4.41	7,857,181.	34,650,168.2
23	BB.14301	Installing zinc coated steel pipe connected by sleeve method, length of pipe 8 m, diameter of pipe d=25mm	100m	1.44	7,857,181.	11,314,340.6
24	BB.14303	Installing zinc coated steel pipe connected by sleeve method, length of pipe 8 m, diameter of pipe d=40mm	100m	1.44	11,852,008.	17,066,891.5
25	BB.14304	Installing zinc coated steel pipe connected by sleeve method, length of pipe 8 m, diameter of pipe d=50mm	100m	0.36	14,802,004.	5,328,721.4
26	TT	Steel Plate 20*20*0.1 cm	no	72.	36,556.	2,632,032.
27	TT	Sun Protection Cover sheet	m2	429.	57,136.	24,511,344.
28	TT	Labour for making tree beds	labour	19.2	202,276.	3,883,699.2
29	TT	Bolt	no	96.	18,278.	1,754,688.
30	TT	Lock D42	no	3.	19,496.	58,488.
TOTAL						**319,633,090**
ROUND TOTAL						**319,633,000**

TableD-6 Typical Cost Estimation for Construction of Silviculture Infrastructure: Nursery

Type of Infrastructure: Nursery
Province: Hoa Binh

No	Code	Description	Unit	Quantity	Unit Price (VND)	Amount (VND)
I		Making tree beds				
1	AB.11312	Digging foundation buttress, wide <= 3 m, depth <= 1 m, soil level II	m3	24.84	209,561.	5,205,495.2
2	AE.32114	Build Brick Wall 5x10x20, wall thickness <=10 cm, high <=4 m, mortar mark 75	m3	37.26	2,326,952.	86,702,231.5
II		Irrigation system				
3	AB.11313	Digging foundation buttress, wide <= 3 m, depth <= 1 m, soil level III	m3	31.95	316,898.	10,124,891.1
4	AB.13412	Embanking pipe foundation, sewer with sand	m3	31.95	401,002.	12,812,013.9
5	BB.19101	Installing plastic pipe form mouth bowl, by glueing method, length of pipe 6 m, diameter of pipe d=20mm	100m	1.3	1,938,853.	2,520,508.9
6	BB.19102	Installing plastic pipe form mouth bowl, by glueing method, length of pipe 6 m, diameter of pipe d=25mm	100m	1.25	2,660,990.	3,326,237.5
7	BB.19104	Installing plastic pipe form mouth bowl, by glueing method, length of pipe 6 m, diameter of pipe d=40mm	100m	1.	3,941,978.	3,941,978.
8	BB.29121	Installing plastic phial type oral bowl connected by glueing method, diameter of phial d=32mm	set	22.	10,604.	233,288.
9	TT	Plastic Sleeve D=27	no	15.	4,265.	63,975.
10	TT	T Connector D=27-21	no	35.	8,529.	298,515.
11	TT	T Connector D=42-27	no	8.	43,867.	350,936.
12	BB.29122	Installing plastic phial type oral bowl connected by glueing method, diameter of phial d=40mm	set	15.	13,068.	196,020.
13	TT	Plastic Sleeve D=42	no	20.	10,358.	207,160.
14	TT	Pump Machine EBARA CMA 150m	no	1.	15,840,825.	15,840,825.
15	TT	Pump Machine PANASONIC A-130JAK	no	1.	1,883,840.	1,883,840.
16	TT	Spay Header Radius 4m	no	51.	290,010.	14,790,510.
17	BA.18401	Installing breakers having 3 poles, one-dimension, type <= 60A	set	1.	183,931.	183,931.
18	BA.19201	Installing 1 phase aptomat, current intensity <= 10A	set	2.	87,028.	174,056.
19	BA.16206	Dragging and spreading kinds of wire, installing 2 bowels wire 2x4mm2	m	40.	33,343.	1,333,720.
III		Roof Cover				
20	AB.11413	Diging foundation column, cylinder, test pit, wide <= 1 m, depth <= 1 m, soil level III	m3	18.9734	485,569.	9,212,894.9
21	AF.11232	Concrete produced by mixer, cast manually, foundation concrete, stone 2x4, width <=250cm, mark 150	m3	15.552	1,483,029.	23,064,067.
22	BB.14301	Installing zinc coated steel pipe connected by sleeve method, length of pipe 8 m, diameter of pipe d=25mm	100m	4.41	7,922,023.	34,936,121.4
23	BB.14301	Installing zinc coated steel pipe connected by sleeve method, length of pipe 8 m, diameter of pipe d=25mm	100m	1.44	7,922,023.	11,407,713.1
24	BB.14303	Installing zinc coated steel pipe connected by sleeve method, length of pipe 8 m, diameter of pipe d=40mm	100m	1.44	11,681,561.	16,821,447.8
25	BB.14304	Installing zinc coated steel pipe connected by sleeve method, length of pipe 8 m, diameter of pipe d=50mm	100m	0.36	14,574,229.	5,246,722.4
26	TT	Steel Plate 20*20*0.1 cm	no	72.	36,556.	2,632,032.
27	TT	Sun Protection Cover sheet	m2	429.	57,136.	24,511,344.
28	TT	Labour for making tree beds	labour	19.2	202,276.	3,883,699.2
29	TT	Bolt	no	96.	18,278.	1,754,688.
30	TT	Lock D42	no	3.	19,496.	58,488.
TOTAL						**293,719,350**
ROUND TOTAL						**293,719,000**

Table D-7 (1)

BẢNG GIÁ DỰ THẦU: Cost Estimation Sheet for Forest Road (Dien Bien)

CÔNG TRÌNH: Forest Road

HẠNG MỤC: Length=1km; width=4,5m; culvert=3

No	Code	Description	Unit	Quantity	Unit Price (VND)	Amount (VND)
		Earth works and Road Form				
1	AA.11214	Chopping down the trees by mechanization, plant density standard/100 m2: <= 5 plants	100m2	119.8742	206,793	24,789,145
2	AB.31143	Digging the new road by excavator <= 1.6 m3, bulldozer <= 110 CV, then pouring onto truck, soil level III	100m3	46.5818	2,975,590	138,608,338
3	AB.31144	Digging the new road by excavator <= 1.6 m3, bulldozer <= 110 CV, then pouring onto truck, soil level IV	100m3	15.5940	3,832,175	59,758,937
4	AB.51314	Digging stone canal, road foundation by driller D42mm, stone	100m3	6.7854	12,227,595	82,969,123
5	AB.11823	Digging road pattern, drainage, fishbone trench, depth <= 30 cm, soil level III	m3	59.2098	327,655	19,400,387
6	AB.25123	Digging foundation, wide <= 6 m, using excavator <= 1.25	100m3	2.3684	3,254,522	7,708,010
7	AB.11824	Digging road pattern, drainage, fishbone trench, depth <= 30 cm, soil level IV	m3	22.0985	376,674	8,323,930
8	AB.25124	Digging foundation, wide <= 6 m, using excavator <= 1.25	100m3	0.8839	3,899,897	3,447,119
9	AB.51614	Digging stone, thickness <= 0.5 m with hammer, stone level	m3	45.1713	869,391	39,271,522
10	AB.64122	Diking road by concretevibrator 16 ton, tight requirement K =	100m3	12.0086	1,117,493	13,419,526
11	AB.52131	Moving stone to transportation by excavator <=1,6m3	100m3	6.7854	2,823,447	19,158,217
12	AB.53131	Transportation soil by self - pouring truck, distance <= 300m,		7.1089	2,018,389	14,348,526
13	AB.41133	Transportation soil by self - pouring truck , distance <= 300m, car 10T, soil level III	100m3	36.3335	1,242,086	45,129,332
14	AB.41134	Transportation soil by self - pouring truck , distance <= 300m, car 10T, soil level IV	100m3	16.6990	1,366,295	22,815,760
15	AB.64123	Diking road by concretevibrator 16 ton, tight requirement K =	100m3	18.8829	1,378,641	26,032,740
		Reinforcing Coarse Rock				
16	AE.12110	Arrange dry stone without pointing, premises	m3	12.8506	745,765	9,583,528
17	AL.15122	Make and drop rock gabion, type 2x1x0,5m on ground	bag	47.0000	1,374,307	64,592,429
		Turning Point				
18	AB.21143	Digging ground using excavator <= 1.6 m3, soil level III	100m3	0.5058	1,417,218	716,829
		Culvert				
19	AB.11323	Digging foundation buttress, wide <= 3 m, depth <= 2 m, soil	m3	60.7500	337,976	20,532,042
20	AB.13411	Embanking foundation with sand	m3	2.9700	421,878	1,252,978
21	AE.11114	Build rubble, build foundation, thickness <=60 cm, cement	m3	18.8100	1,437,667	27,042,516
22	AG.11613	Produce precast concrete structure, buy pipe concrete, diameter <= 70 cm, stone 1x2, mark 200	m3	1.7100	2,157,313	3,689,005
23	AG.42111	Install precast concrete components, install precast concrete components manually, weight <=50kg	Items	18.0000	48,287	869,166
24	AB.13113	Embanking foundation, tight requirement of K = 0.95	m3	20.2500	180,598	3,657,110
		Total				**657,116,215**
		Round				**657,116,000**

Table D-7 (2)

BẢNG GIÁ DỰ THẦU: Cost Estimation Sheet for Forest Road (Lai Chau)

CÔNG TRÌNH: Forest Road

HẠNG MỤC: Length=1km; width=4,5m; culvert=3

No	Code	Description	Unit	Quantity	Unit Price (VND)	Amount (VND)
		Earth works and Road Form				
1	AA.11214	Chopping down the trees by mechanization, plant density standard/100 m2: <= 5 plants	100m2	119.8742	199,750	23,944,871
2	AB.31143	Digging the new road by excavator <= 1.6 m3, bulldozer <= 110 CV, then pouring onto truck, soil level III	100m3	46.5818	2,869,455	133,664,379
3	AB.31144	Digging the new road by excavator <= 1.6 m3, bulldozer <= 110 CV, then pouring onto truck, soil level IV	100m3	15.5940	3,682,191	57,420,086
4	AB.51314	Digging stone canal, road foundation by driller D42mm, stone level IV	100m3	6.7854	12,148,120	82,429,853
5	AB.11823	Digging road pattern, drainage, fishbone trench, depth <= 30 cm, soil level III	m3	59.2098	327,655	19,400,387
6	AB.25123	Digging foundation, wide <= 6 m, using excavator <= 1.25 m3, soil level III	100m3	2.3684	3,165,388	7,496,905
7	AB.11824	Digging road pattern, drainage, fishbone trench, depth <= 30 cm, soil level IV	m3	22.0985	376,674	8,323,930
8	AB.25124	Digging foundation, wide <= 6 m, using excavator <= 1.25 m3, soil level IV	100m3	0.8839	3,778,273	3,339,616
9	AB.51614	Digging stone, thickness <= 0.5 m with hammer, stone level	m3	45.1713	817,758	36,939,192
10	AB.64122	Diking road by concretevibrator 16 ton, tight requirement K =	100m3	12.0086	1,062,148	12,754,910
11	AB.52131	Moving stone to transportation by excavator <=1,6m3	100m3	6.7854	2,654,595	18,012,489
12	AB.53131	Transportation soil by self - pouring truck, distance <= 300m, car 10T		7.1089	1,847,442	13,133,280
13	AB.41133	Transportation soil by self - pouring truck , distance <= 300m, car 10T, soil level III	100m3	36.3335	1,136,887	41,307,084
14	AB.41134	Transportation soil by self - pouring truck , distance <= 300m, car 10T, soil level IV	100m3	16.6990	1,250,576	20,883,369
15	AB.64123	Diking road by concretevibrator 16 ton, tight requirement K =	100m3	18.8829	1,301,673	24,579,361
		Reinforcing Coarse Rock				
16	AE.12110	Arrange dry stone without pointing, premises	m3	12.8506	933,161	11,991,679
17	AL.15122	Make and drop rock gabion, type 2x1x0,5m on ground	bag	47.0000	1,552,249	72,955,703
		Turning Point				
18	AB.21143	Digging ground using excavator <= 1.6 m3, soil level III	100m3	0.5058	1,330,795	673,116
		Culvert				
19	AB.11323	Digging foundation buttress, wide <= 3 m, depth <= 2 m, soil	m3	60.7500	337,976	20,532,042
20	AB.13411	Embanking foundation with sand	m3	2.9700	913,287	2,712,462
21	AE.11114	Build rubble, build foundation, thickness <=60 cm, cement mortar mark 75	m3	18.8100	1,746,822	32,857,722
22	AG.11613	Produce precast concrete structure, buy pipe concrete, diameter <= 70 cm, stone 1x2, mark 200	m3	1.7100	2,543,111	4,348,720
23	AG.42111	Install precast concrete components, install precast concrete components manually, weight <=50kg	Items	18.0000	49,902	898,236
24	AB.13113	Embanking foundation, tight requirement of K = 0.95	m3	20.2500	180,598	3,657,110
		Total				**654,256,502**
		Round				**654,257,000**

BẢNG GIÁ DỰ THẦU: Cost Estimation Sheet for Forest Road (Son La)

CÔNG TRÌNH: Forest Road

HẠNG MỤC: Length=1km; width=4,5m; culvert=3

No	Code	Description	Unit	Quantity	Unit Price (VND)	Amount (VND)
1	AA.11214	Chopping down the trees by mechanization, plant density standard/100 m2: <= 5 plants	100m2	119.8742	199,750	23,944,871
2	AB.31143	Digging the new road by excavator <= 1.6 m3, bulldozer <= 110 CV, then pouring onto truck, soil level III	100m3	46.5818	2,869,455	133,664,379
3	AB.31144	Digging the new road by excavator <= 1.6 m3, bulldozer <= 110 CV, then pouring onto truck, soil level IV	100m3	15.5940	3,682,191	57,420,086
4	AB.51314	Digging stone canal, road foundation by driller D42mm, stone level IV	100m3	6.7854	11,333,183	76,900,180
5	AB.11823	Digging road pattern, drainage, fishbone trench, depth <= 30 cm, soil level III	m3	59.2098	327,655	19,400,387
6	AB.25123	Digging foundation, wide <= 6 m, using excavator <= 1.25 m3, soil level III	100m3	2.3684	3,165,388	7,496,905
7	AB.11824	Digging road pattern, drainage, fishbone trench, depth <= 30 cm, soil level IV	m3	22.0985	376,674	8,323,930
8	AB.25124	Digging foundation, wide <= 6 m, using excavator <= 1.25 m3, soil level IV	100m3	0.8839	3,778,273	3,339,616
9	AB.51614	Digging stone, thickness <= 0.5 m with hammer, stone level	m3	45.1713	746,134	33,703,843
10	AB.64122	Diking road by concretevibrator 16 ton, tight requirement K =	100m3	12.0086	1,169,105	14,039,314
11	AB.52131	Moving stone to transportation by excavator <=1,6m3	100m3	6.7854	2,709,743	18,386,690
12	AB.53131	Transportation soil by self - pouring truck, distance <= 300m, car 10T		7.1089	1,847,442	13,133,280
13	AB.41133	Transportation soil by self - pouring truck , distance <= 300m, car 10T, soil level III	100m3	36.3335	1,136,887	41,307,084
14	AB.41134	Transportation soil by self - pouring truck , distance <= 300m, car 10T, soil level IV	100m3	16.6990	1,250,576	20,883,369
15	AB.64123	Diking road by concretevibrator 16 ton, tight requirement K =	100m3	18.8829	1,450,430	27,388,325
		Reinforcing Coarse Rock				
16	AE.12110	Arrange dry stone without pointing, premises	m3	12.8506	971,376	12,482,764
17	AL.15122	Make and drop rock gabion, type 2x1x0,5m on ground	bag	47.0000	1,533,406	72,070,082
		Turning Point				
18	AB.21143	Digging ground using excavator <= 1.6 m3, soil level III	100m3	0.5058	1,330,795	673,116
		Culvert				
19	AB.11323	Digging foundation buttress, wide <= 3 m, depth <= 2 m, soil	m3	60.7500	337,976	20,532,042
20	AB.13411	Embanking foundation with sand	m3	2.9700	963,453	2,861,455
21	AE.11114	Build rubble, build foundation, thickness <=60 cm, cement mortar mark 75	m3	18.8100	1,681,818	31,634,997
22	AG.11613	Produce precast concrete structure, buy pipe concrete, diameter <= 70 cm, stone 1x2, mark 200	m3	1.7100	2,513,350	4,297,829
23	AG.42111	Install precast concrete components, install precast concrete components manually, weight <=50kg	Items	18.0000	49,539	891,702
24	AB.13113	Embanking foundation, tight requirement of K = 0.95	m3	20.2500	180,598	3,657,110
		Total				**648,433,356**
		Round				**648,433,000**

Table D-7 (4)

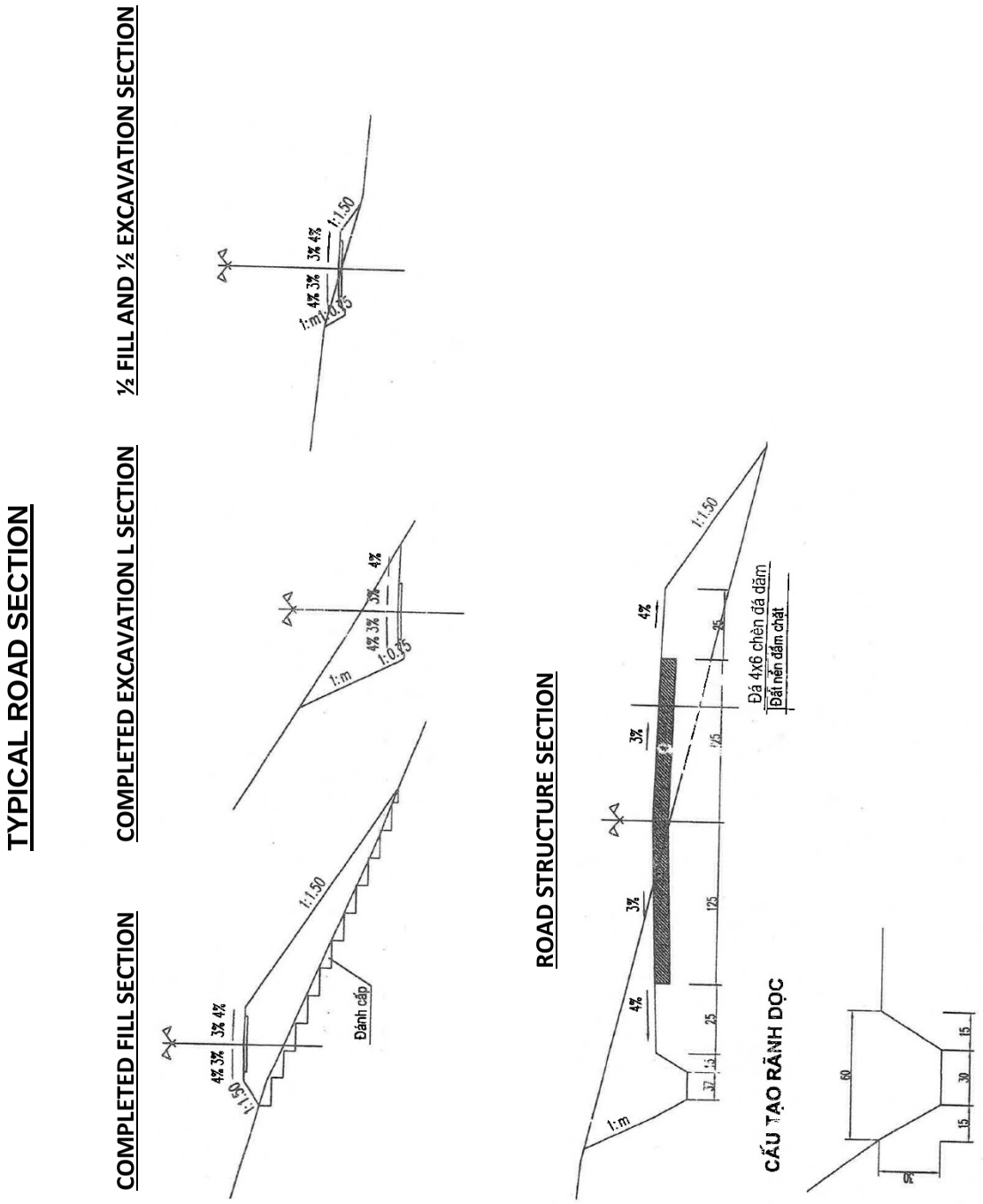
CÔNG TRÌNH: Forest Road Hoa Binh

HẠNG MỤC: Length=1km; width=4,5m; culvert=3

No	Code	Description	Unit	Quantity	Unit Price (VND)	Amount (VND)
		Earth works and Road Form				
1	AA.11214	Chopping down the trees by mechanization, plant density standard/100 m2: <= 5 plants	100m2	119.8742	203,805	24,430,961
2	AB.31143	Digging the new road by excavator <= 1.6 m3, bulldozer <= 110 CV, then pouring onto truck, soil level II	100m3	46.5818	2,936,438	136,784,568
3	AB.31144	Digging the new road by excavator <= 1.6 m3, bulldozer <= 110 CV, then pouring onto truck, soil level IV	100m3	15.5940	3,777,780	58,910,701
4	AB.51314	Digging stone canal, road foundation by driller D42mm, stone level IV	100m3	6.7854	11,316,675	76,788,167
5	AB.11823	Digging road pattern, drainage, fishbone trench, depth <= 30 cm, soil level III	m3	59.2098	327,655	19,400,387
6	AB.25123	Digging foundation, wide <= 6 m, using excavator <= 1.25 m3, soil level III	100m3	2.3684	3,224,540	7,637,001
7	AB.11824	Digging road pattern, drainage, fishbone trench, depth <= 30 cm, soil level IV	m3	22.0985	376,674	8,323,930
8	AB.25124	Digging foundation, wide <= 6 m, using excavator <= 1.25 m3, soil level IV	100m3	0.8839	3,858,987	3,410,959
9	AB.51614	Digging stone, thickness <= 0.5 m with hammer, stone level	m3	45.1713	863,311	38,996,880
10	AB.64122	Diking road by concretevibrator 16 ton, tight requirement K =	100m3	12.0086	1,142,431	13,718,997
11	AB.52131	Moving stone to transportation by excavator <=1,6m3	100m3	6.7854	2,814,087	19,094,706
12	AB.53131	Transportation soil by self - pouring truck, distance <= 300m, car 10T		7.1089	1,981,680	14,087,565
13	AB.41133	Transportation soil by self - pouring truck , distance <= 300m, car 10T, soil level III	100m3	36.3335	1,219,496	44,308,558
14	AB.41134	Transportation soil by self - pouring truck , distance <= 300m, car 10T, soil level IV	100m3	16.6990	1,341,445	22,400,790
15	AB.64123	Diking road by concretevibrator 16 ton, tight requirement K =	100m3	18.8829	1,413,368	26,688,487
		Reinforcing Coarse Rock				
16	AE.12110	Arrange dry stone without pointing, premises	m3	12.8506	637,385	8,190,780
17	AL.15122	Make and drop rock gabion, type 2x1x0,5m on ground	bag	47.0000	1,201,054	56,449,538
		Turning Point				
18	AB.21143	Digging ground using excavator <= 1.6 m3, soil level II	100m3	0.5058	1,385,680	700,877
		Culvert				
19	AB.11323	Digging foundation buttress, wide <= 3 m, depth <= 2 m, soil	m3	60.7500	337,976	20,532,042
20	AB.13411	Embanking foundation with sand	m3	2.9700	384,847	1,142,996
21	AE.11114	Build rubble, build foundation, thickness <=60 cm, cement mortar mark 75	m3	18.8100	1,210,080	22,761,605
22	AG.11613	Produce precast concrete structure, buy pipe concrete, diameter <= 70 cm, stone 1x2, mark 200	m3	1.7100	1,971,199	3,370,750
23	AG.42111	Install precast concrete components, install precast concrete components manually, weight <=50kg	Items	18.0000	47,630	857,340
24	AB.13113	Embanking foundation, tight requirement of K = 0.95	m3	20.2500	180,598	3,657,110
		Total				**632,645,695**
		Round				**632,646,000**

Figures

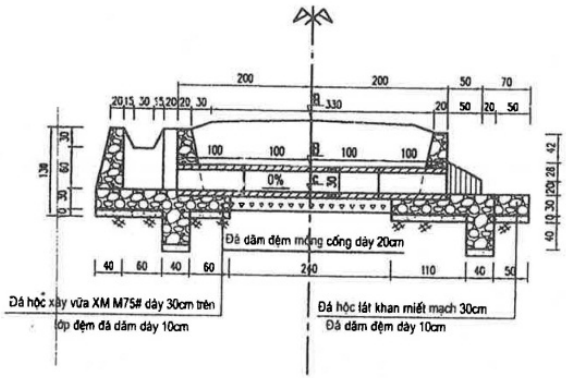
Figure D-1 Typical design of silviculture infrastructure : Forestry Road



TYPICAL CULVERT SECTION

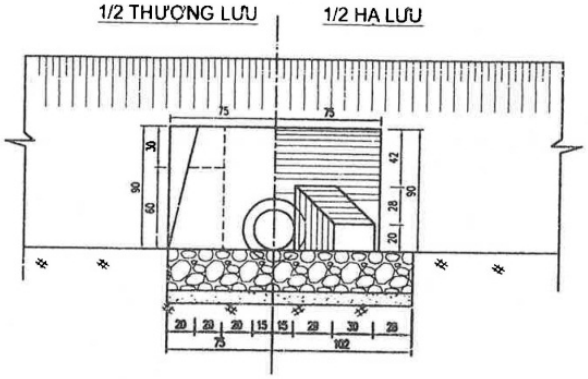
HORIZONTAL CULVERT SECTION

TỶ LỆ: 1/100



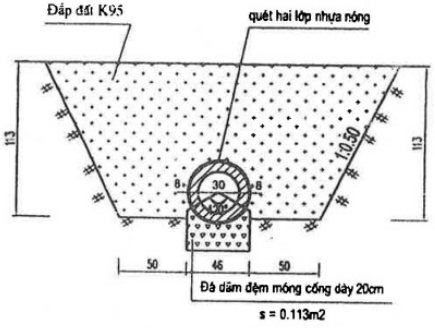
HEAD CULVERT SECTION

TỶ LỆ: 1/50



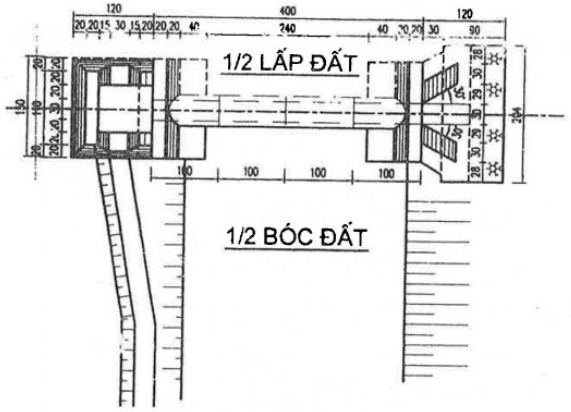
BODY CULVERT SECTION

TỶ LỆ: 1/50



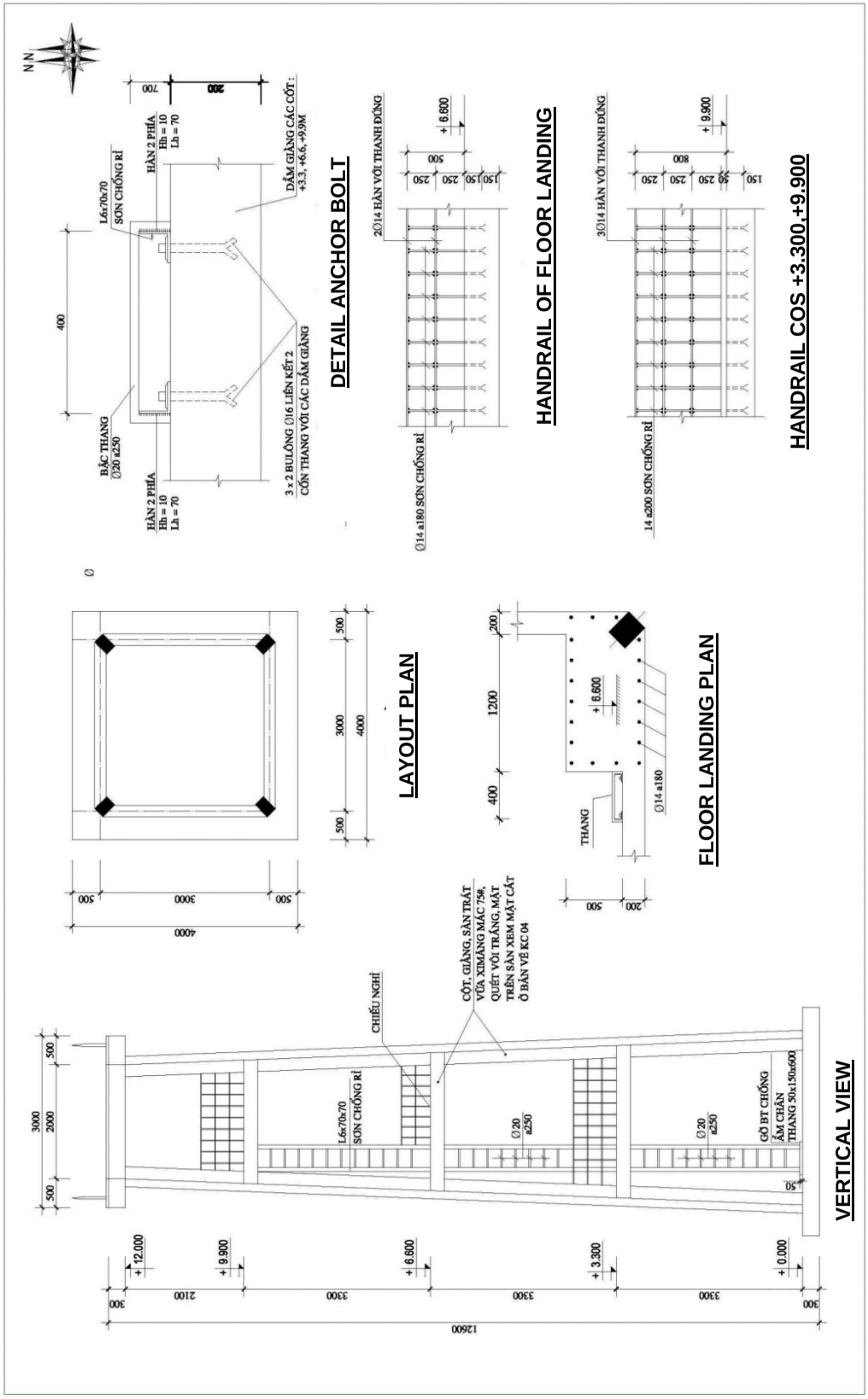
LAYOUT PLAN

TỶ LỆ: 1/100

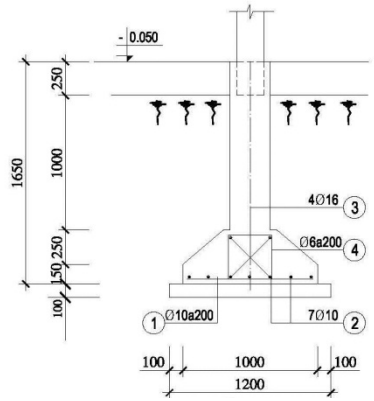


D - F - 2

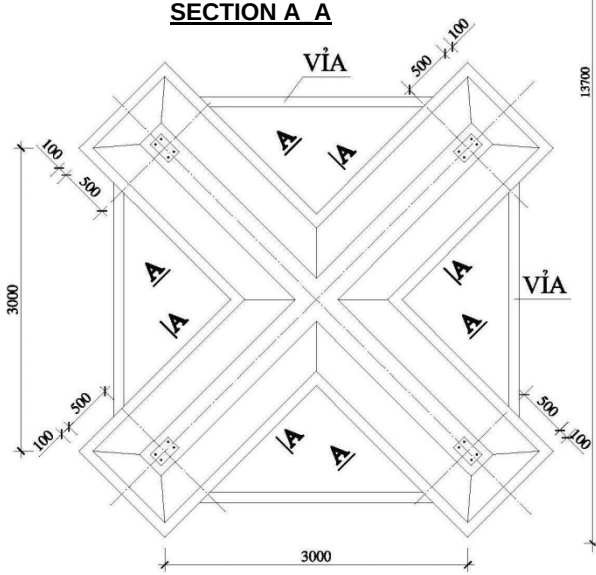
Figure D-2 Typical design of silviculture infrastructure : Fire Watch Tower

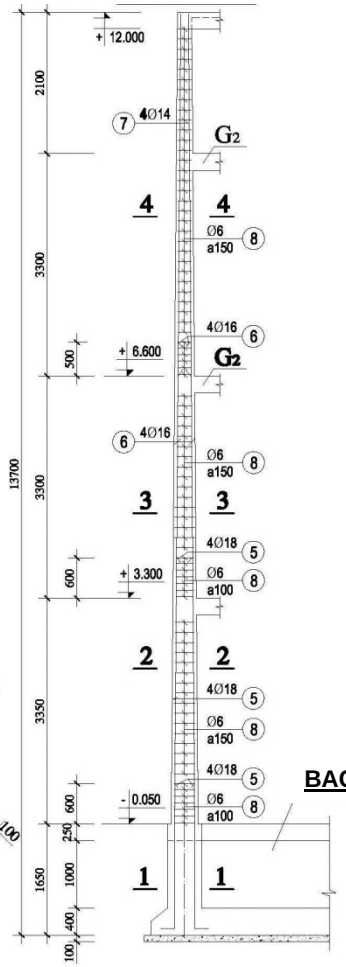


DETAIL 04 COLUMNS

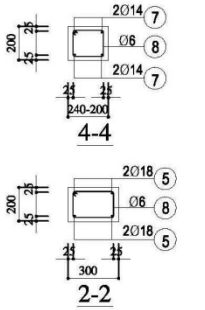


SECTION A A





BACKING G1

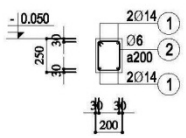


DETAIL STEEL TABLE

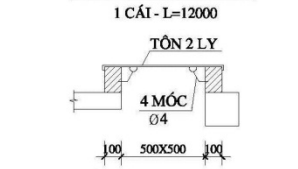
C.K	KH	HÌNH DẠNG KÍCH THƯỚC	ĐK mm	SỐ THANH		CHIỀU DÀI	
				1 C.K	T. BỘ	1THANH	T.BỘ
MÓNG	1	940	10	54	54	940	50.8
	2	5180	10	14	14	5180	72.6
	3	400 4600 400	16	8	8	5400	43.2
	4	300 340 50	6	40	40	1380	55.2
CỘT	5	300 5450+600	18	4	16	6350	101.6
	6	3800	16	4	16	3800	60.8
	7	5380	14	4	16	5380	86.1
	8	150 150-250 50	6	90	90		90
	9	50 700 50	6		40	800	32.0

NOTES:

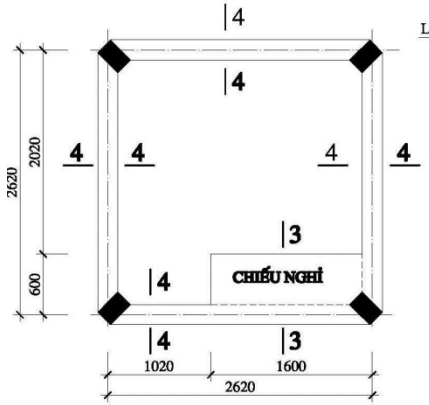
-Bedding foundation by stone concrete 20x40 M50
- Foundation Concrete M200, Stone 20x40
- Column Concrete M200, Stone 10x20
- Steel Bar D<10, Ra=2100kg/cm2
- Steel Bar D>10, Ra=2700kg.cm2
- Designed Foundation, Soil with R=1.5kg/cm2
- Weak Soil must be informed to Designer.



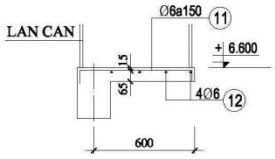
FOUNDATION BEAM D1



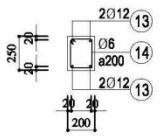
OPEN AREA FOR LADDER



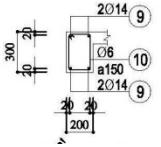
LINK BEAM COS +6.600



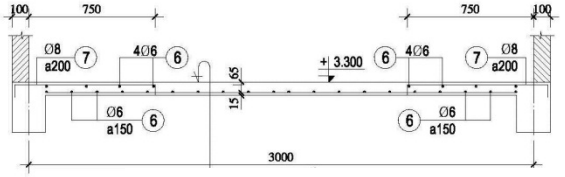
SECTION 3-3



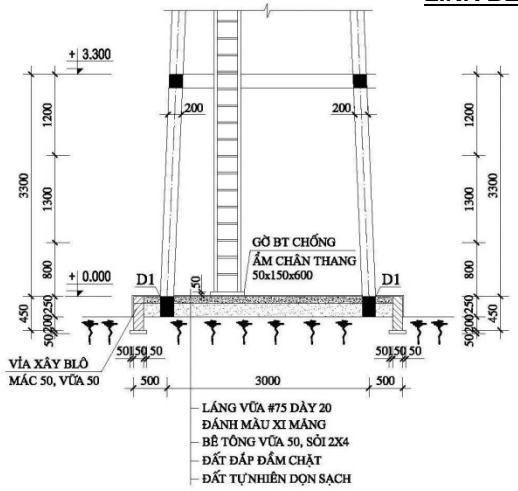
SECTION 4-4



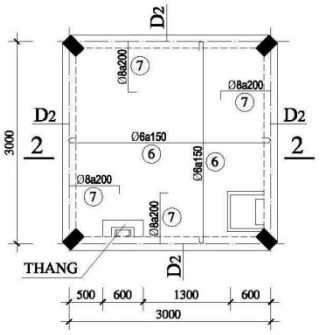
BEAM D2



SECTION 2-2



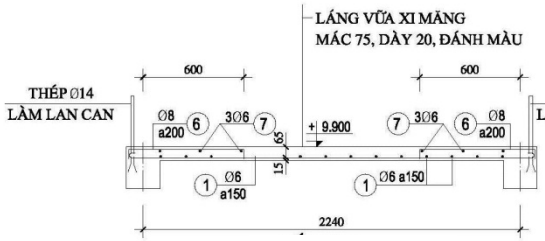
SECTION 1-1



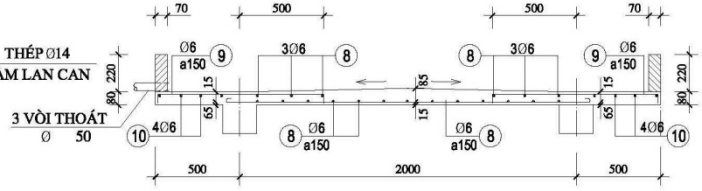
FLOOR COS +3.300

DETAIL STEEL TABLE

C.K	KH	HÌNH DẠNG KÍCH THƯỚC	ĐK mm	SỐ THANH		CHIỀU DÀI	
				1 C.K	T. BỘ	1THANH	T.BỘ
DẦM SÀN DS1-DS2	1	12500 500 50	14	4	4	13000	54.0
	2	140 190	6	60	60	760	45.6
	3	50 1350 50	8	5	20	1450	29.0
	4	80 160 400 55 50	6	10	40	985	39.4
	5	50 1350 50	6	3	12	1450	17.4
	6	50 3150 50	6	40	56	3250	182.0
	7	65 820 65 600	8	46	46	950	43.7
	8	550 600	12	1	1	1750	1.8
	9	12500 50	14	4	4	13000	54.0
	10	160 260	6	80	80	940	75.2
	11	55 650 55	6	12	12	760	9.2
	12	50 1650 50	6	4	4	1750	7.0
	13	11050 500 50	12	4	4	11550	46.2
	14	160 210	6		56	840	47.1

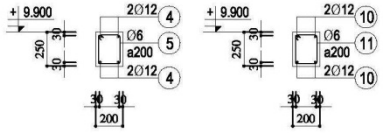


SECTION 1-1



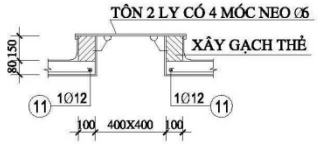
SECTION 2-2

MẶT TRÊN LÁNG VỮA XI MĂNG MÁC 75, DÀY 20.



BEAM D1

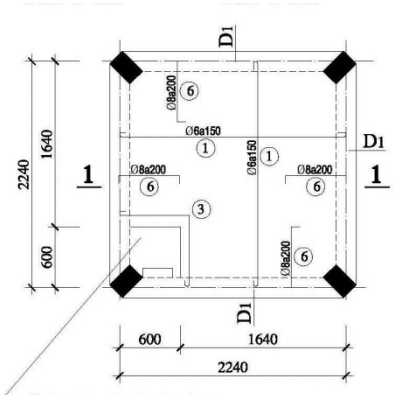
BEAM D2



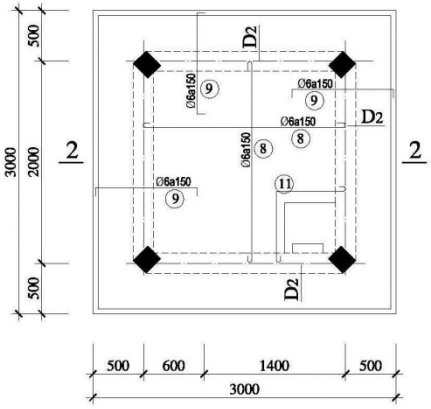
OPEN AREA OF ROOF

DETAIL STEEL TABLE

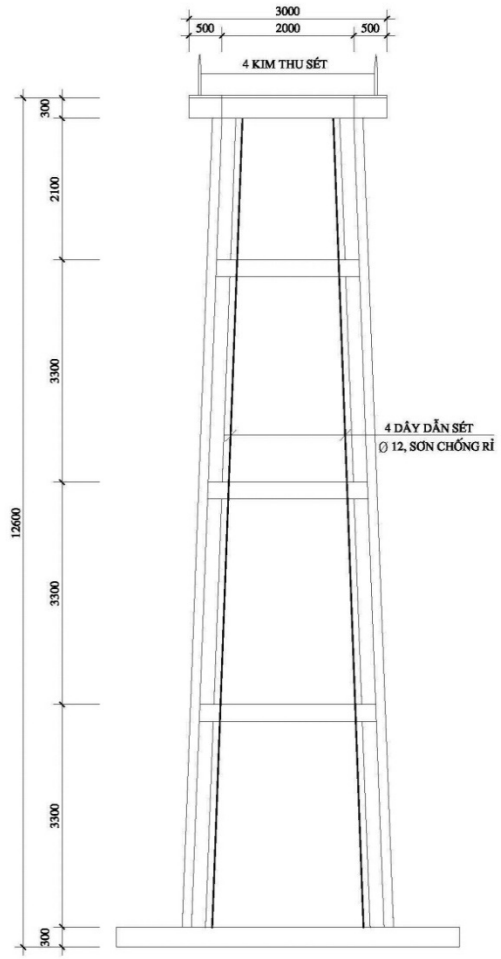
C.K	KH	HÌNH DẠNG KÍCH THƯỚC	ĐK mm	SỐ THANH		CHIỀU DÀI	
				1 C.K	T. BỘ	1THANH	T.BỘ
SÀN COS +9.9	1	50 2400 50	6	22	22	2500	55.0
	2	50 1690 50	8	4	8	1790	14.4
	3	690	12	1	1	1380	1.4
	4	9250 500	12	4	4	9740	39.0
	5	160 210 50	6	40	40	840	33.6
	6	50 650 50	8	44	44	750	33.0
	7	50 cối giá 50	6	12	12	1220	14.7
SÀN COS +12.0	8	50 2150 50	6	36	36	2250	81.0
	9	65 1000 65	6	48	48	1130	54.3
	10	50 2950 50	6	16	16	3050	48.8
	11	600	12	1	1	1200	1.2
	12	160 210 50 8600 500	12	4	4	9100	36.4
	13		6	36	36	840	30.3

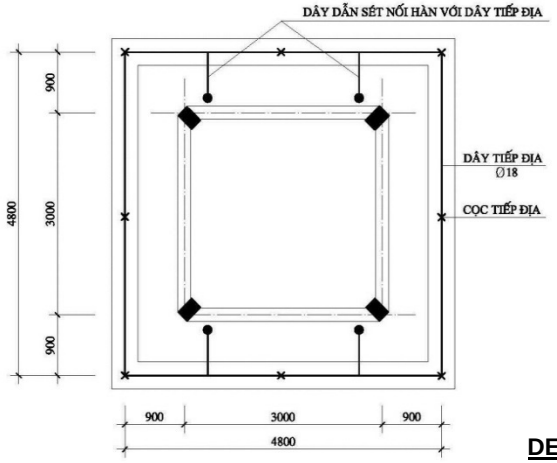


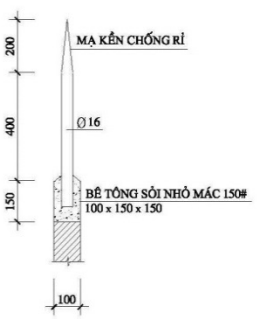
FLOOR COS +9.900



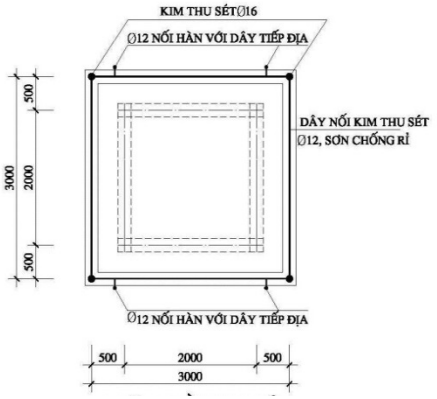
ROOF FLOOR COS +12.000



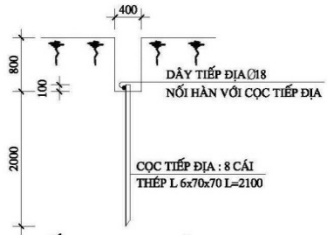




DETAIL 04 ARRESTERS

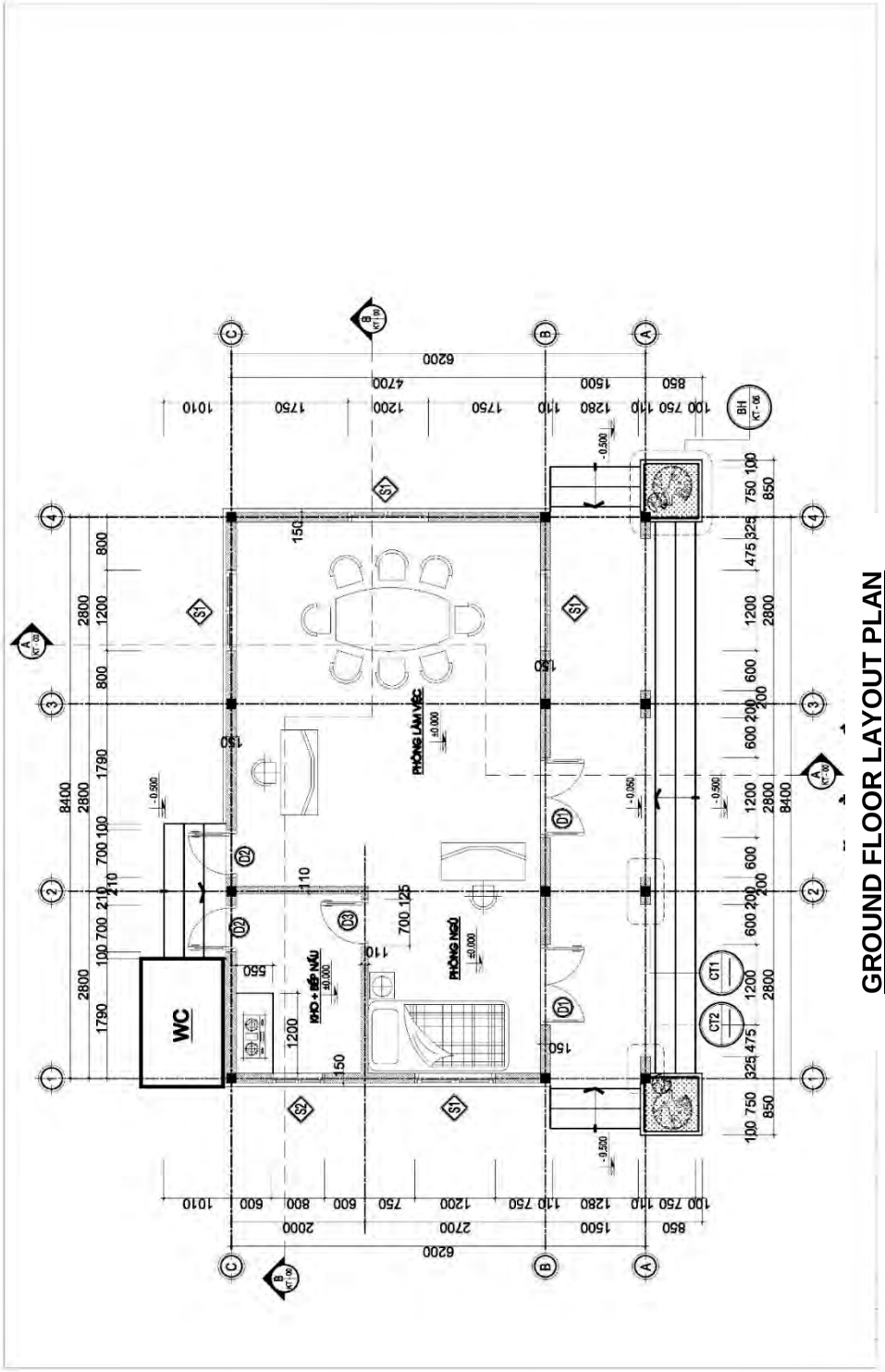


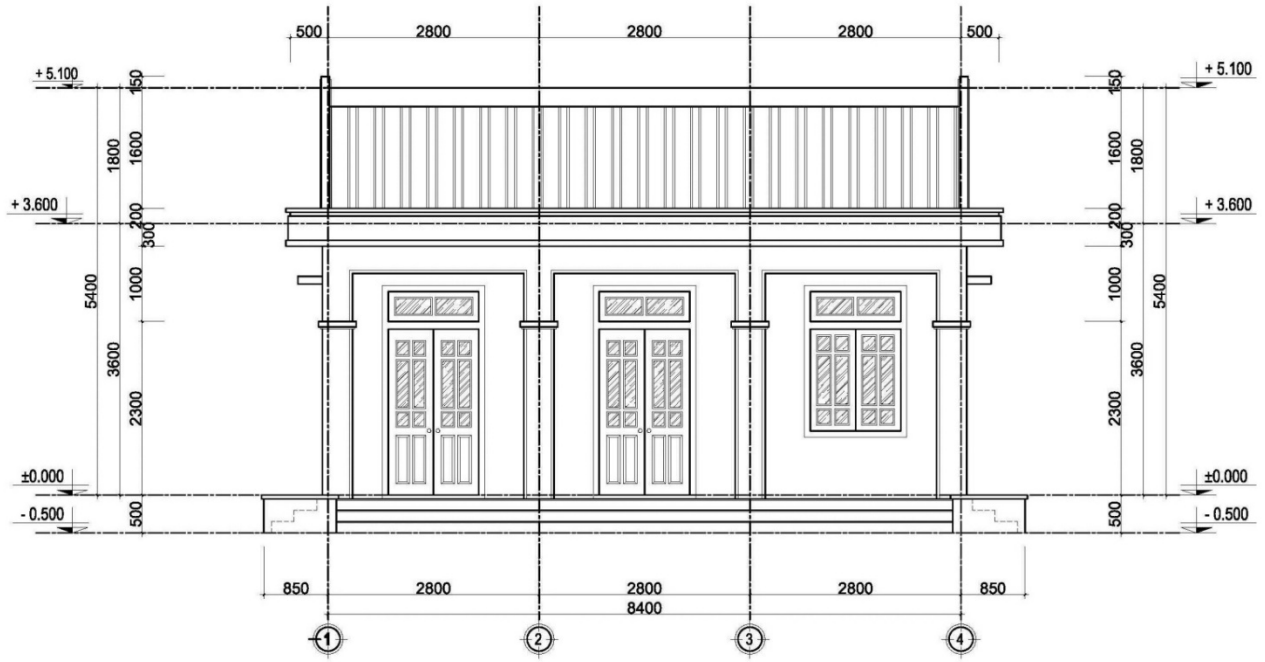
ROOF FLOOR LAYOUT



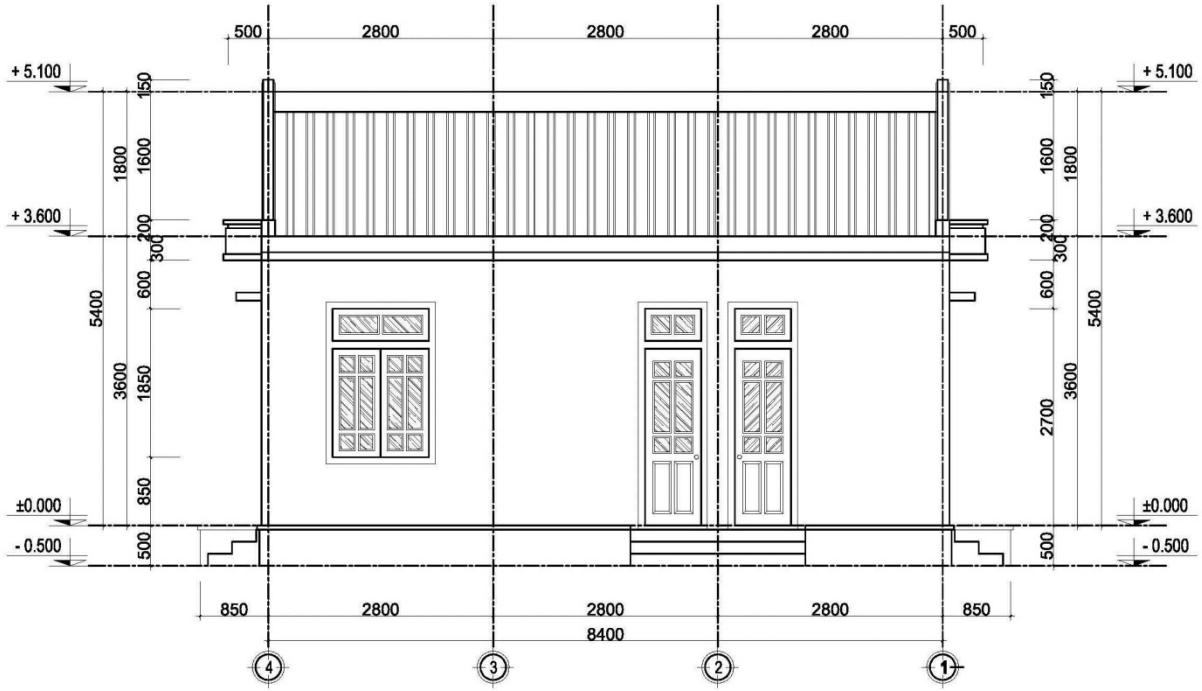
EARTHING RODS

Figure D-3 Typical design of silviculture infrastructure : Forestry Guard Station

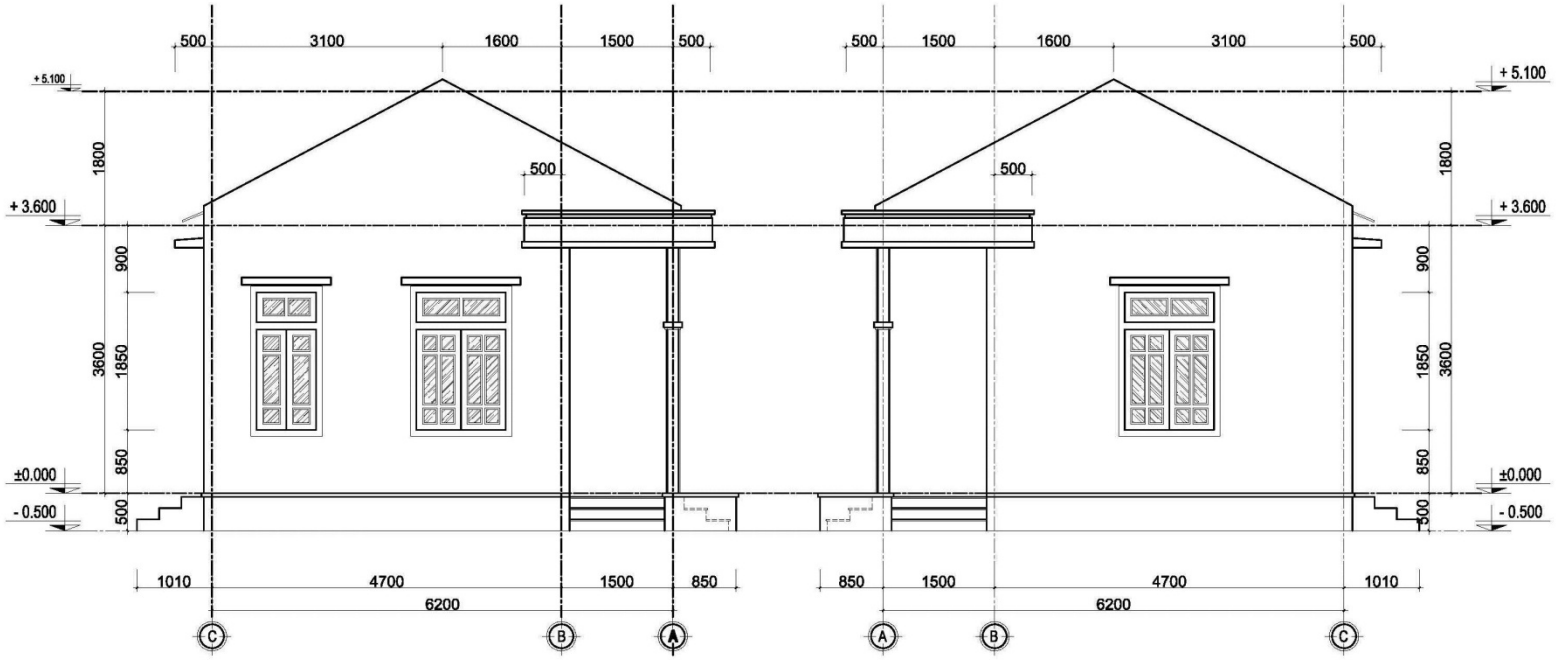




VERTICAL VIEW 1-4



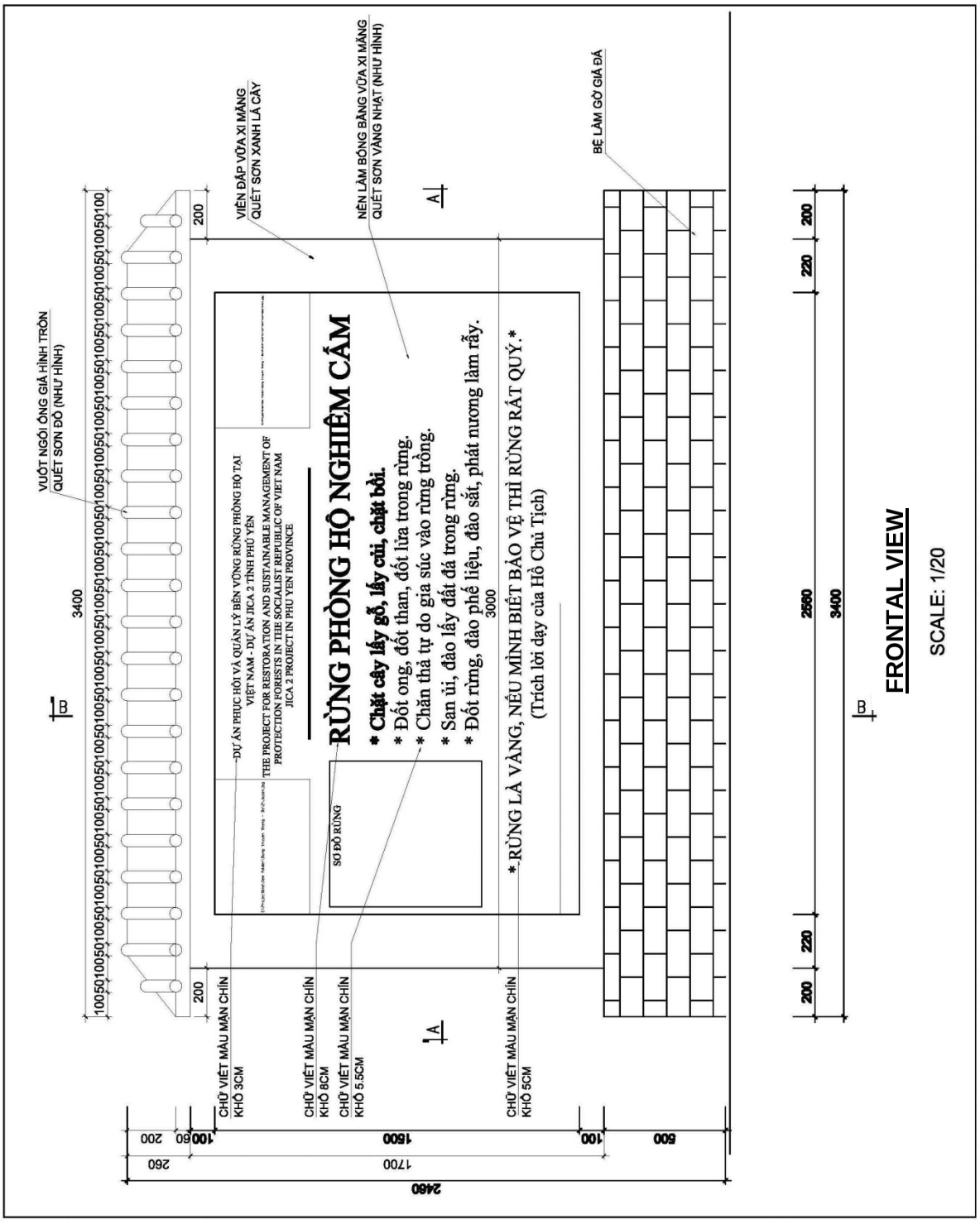
VERTICAL VIEW 4-1



VERTICAL VIEW C-A

VERTICAL VIEW A-C

Figure D-4 Typical design of silviculture infrastructure : Information Board



BACK VIEW

SCALE: 1/20

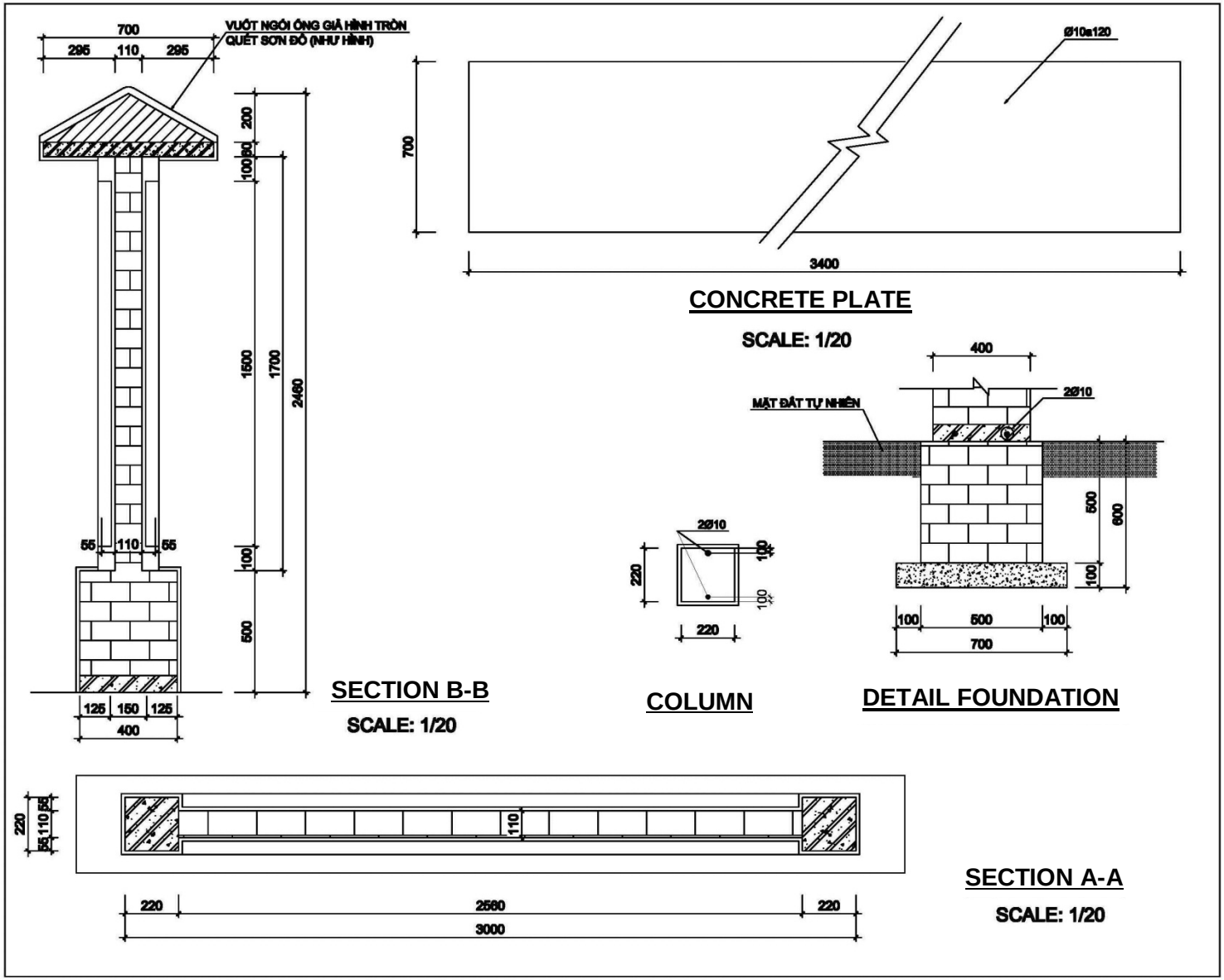
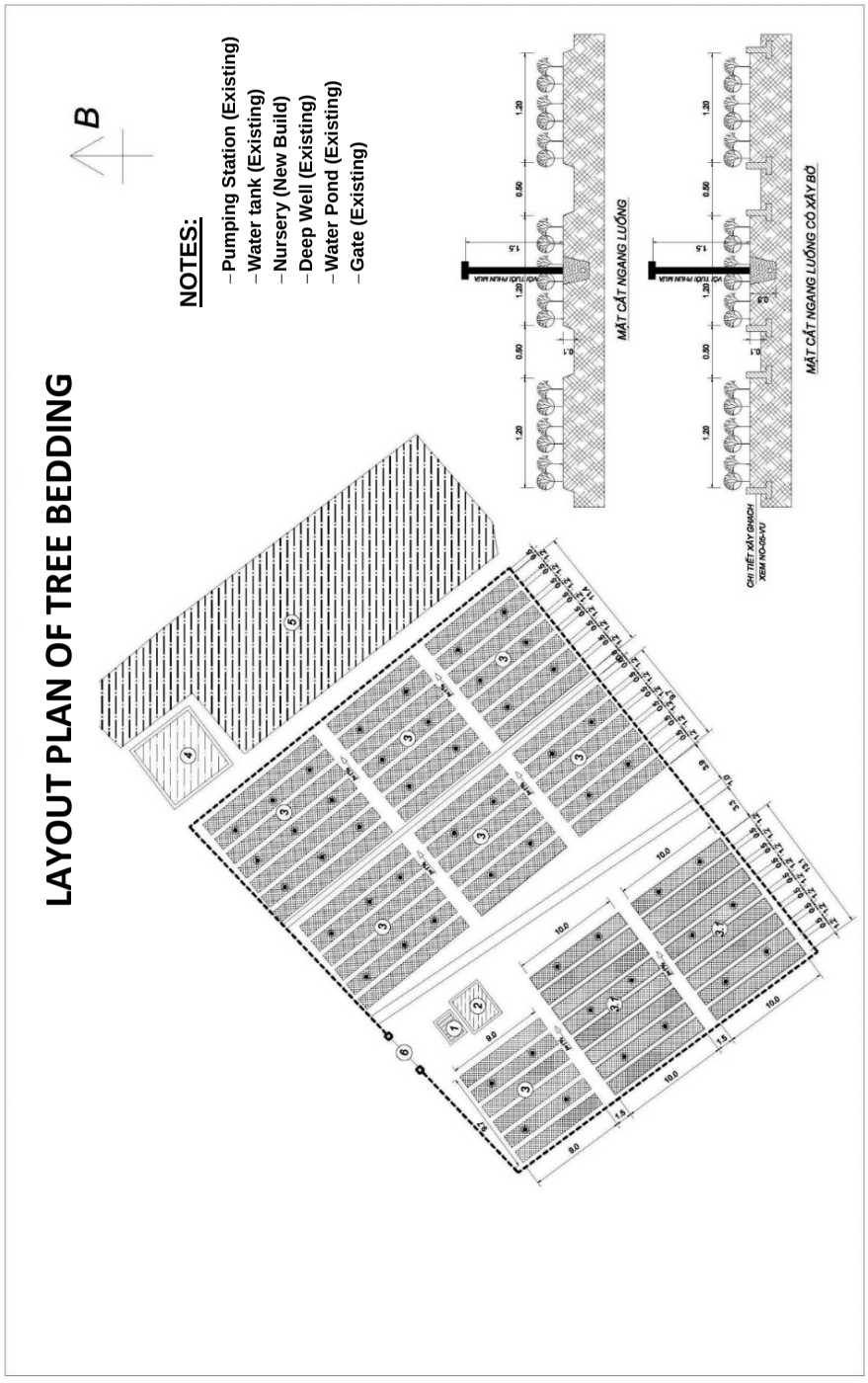

700
295
110
295
VUÔT NGÔI ÔNG GIẢ HÌNH TRÒN
QUÉT SƠN ĐỎ (NHƯ HÌNH)
200
100
1500
1700
2460
100
500
55
110
55
125
150
125
400
SECTION B-B
SCALE: 1/20
Ø10a120
700
3400
CONCRETE PLATE
SCALE: 1/20
2Ø10
220
110
100
220
COLUMN
400
2Ø10
MẶT ĐẤT TỰ NHIÊN
500
600
100
100
500
100
700
DETAIL FOUNDATION
220
55
110
55
110
220
2560
220
3000
SECTION A-A
SCALE: 1/20

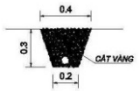
Figure D-5 Typical design of silviculture infrastructure : Nursery



LAYOUT PLAN OF IRRIGATION SYSTEM

NOTES:

- Pumping Station (Existing)
- Water tank (Existing)
- Nursery (New Build)
- Deep Well (Existing)
- Water Pond (Existing)
- Gate (Existing)

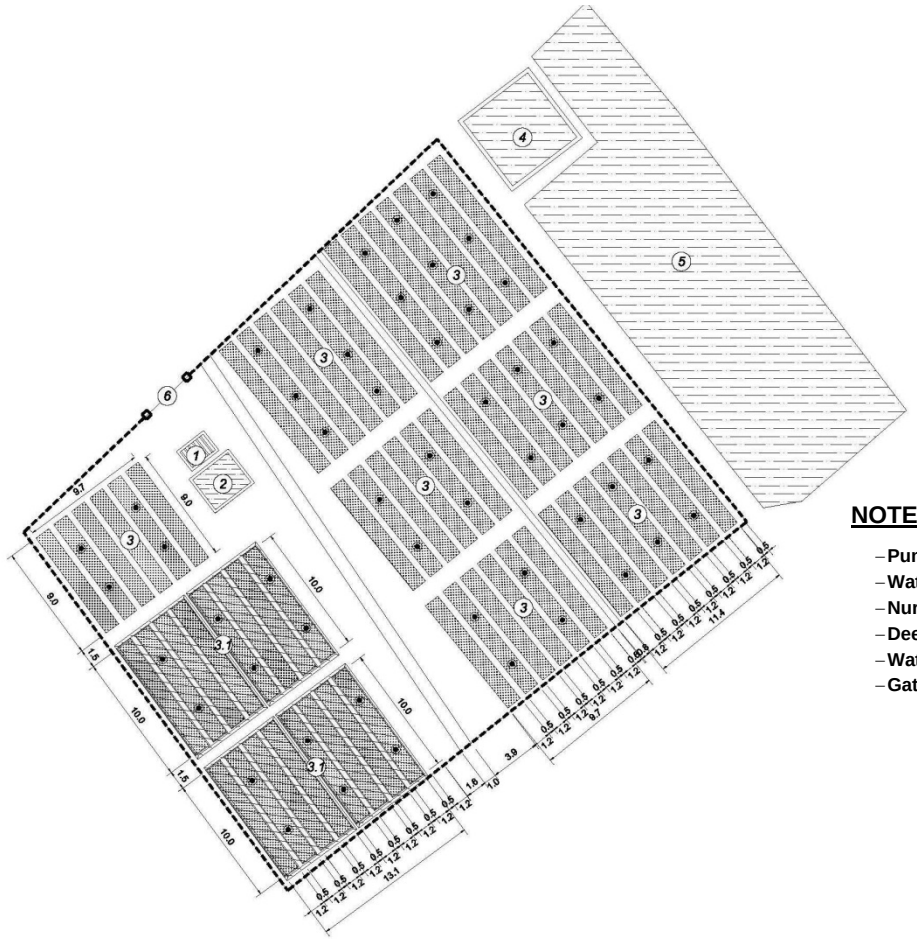


MẶT CẮT ỐNG

THỐNG KÊ VẬT LIỆU CẤP NƯỚC

TT	TÊN VẬT LIỆU QUY CÁCH	ĐƠN VỊ	SỐ LƯỢNG	TT	TÊN VẬT LIỆU QUY CÁCH	ĐƠN VỊ	SỐ LƯỢNG
1	ỐNG NHỰA TIỀN PHONG PVC D=21	M	130	10	MĂNG SÔNG NHỰA D = 42	CÁI	20
2	ỐNG NHỰA TIỀN PHONG PVC D=27	M	125	11	KHÓA NƯỚC D42	CÁI	03
3	ỐNG NHỰA TIỀN PHONG PVC D=42	M	100	12	MÁY BƠM EBARA CMA 150M	CÁI	1
4	CÚT NHỰA D = 21	CÁI	22	13	MÁY BƠM PANASONIC A-130JAK	CÁI	1
6	MĂNG SÔNG NHỰA D = 27	CÁI	15	14	ĐẦU PHUN SƯƠNG (BÁN KÍNH PHUN 4M)	CÁI	51
7	TÊ NHỰA D=27-21	CÁI	35	15	CẦU DAO 1 PHA 50A	CÁI	1
8	TÊ NHỰA D=42-27	CÁI	8	16	ATOMAT 1 PHA 10A	CÁI	02
9	CÚT NHỰA D = 42	CÁI	15	17	DÂY ĐIỆN 2X4	M	40

LAYOUT PLAN OF COVER

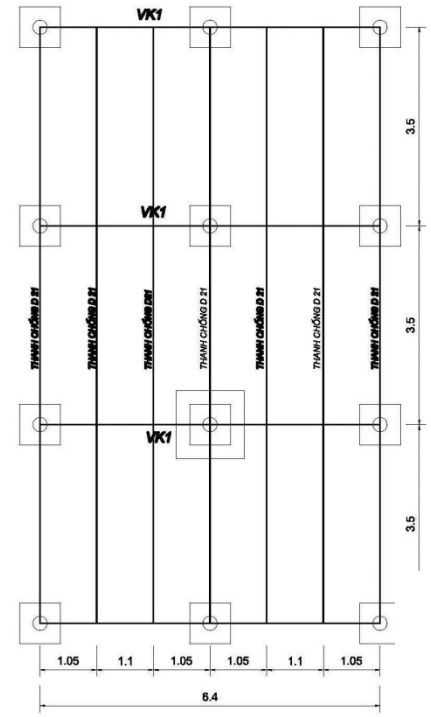


NOTES:

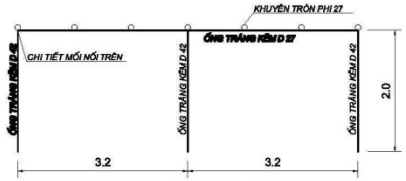
- **Pumping Station (Existing)**
- **Water tank (Existing)**
- **Nursery (New Build)**
- **Deep Well (Existing)**
- **Water Pond (Existing)**
- **Gate (Existing)**

C

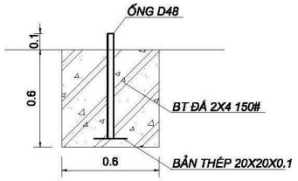
DETAIL COVER ROOF

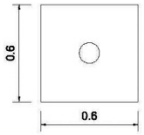


MẶT BẰNG 1 ĐƠN NGUYÊN HỆ THỐNG LƯỚI CHE (S

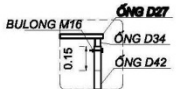


KHUNG VK1



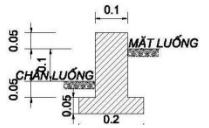


DETAIL FOUNDATION



DETAIL UPPER CONNECTION

DETAIL UNDER CONNECTION



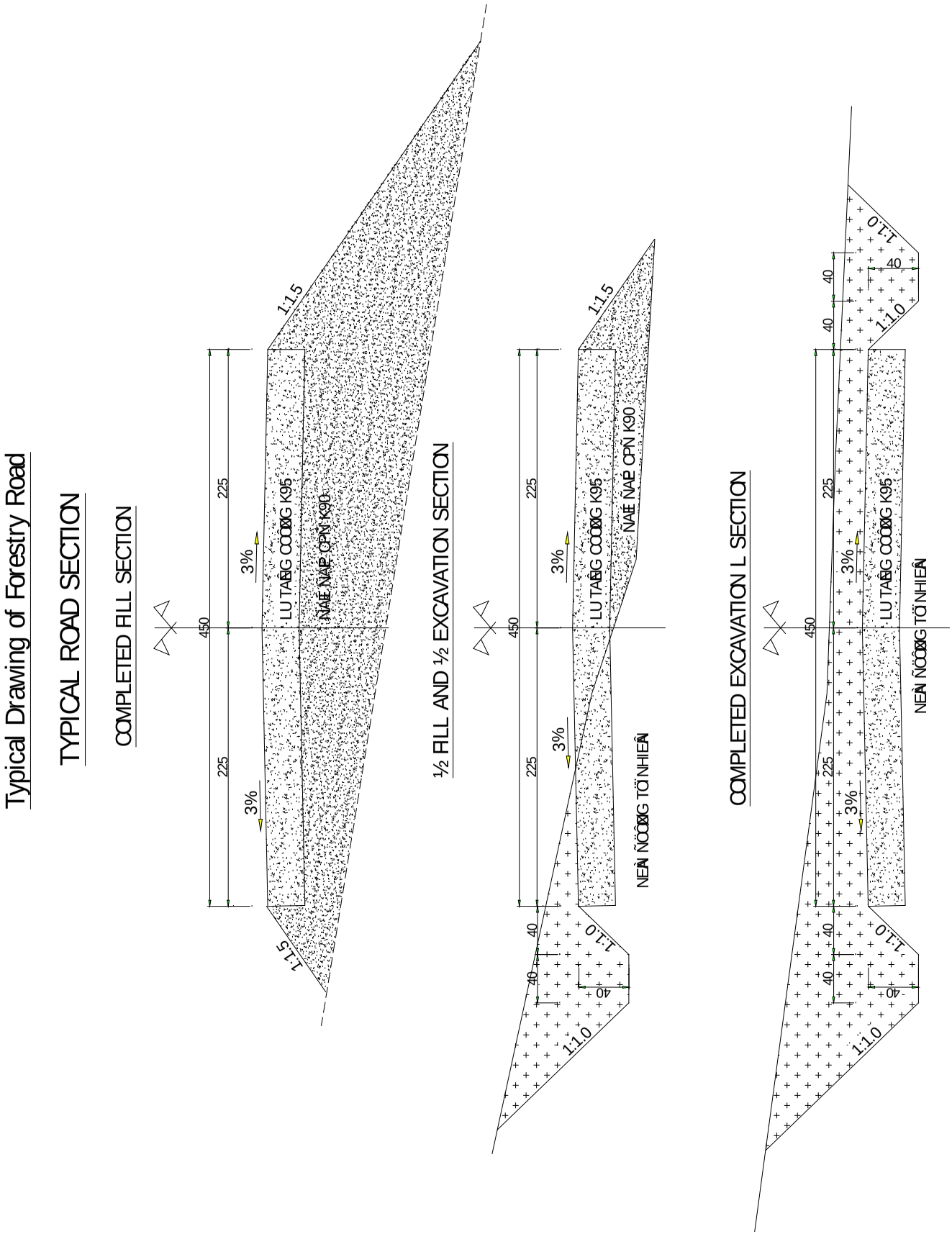
DETAIL BRICK WALL OF TREE BEDDING

GHI CHÚ:
ĐƠN VỊ TÍNH TRONG BẢN VẼ LÀ MÉT (M)
CHỈ XÂY MÓNG BỐ LUỐNG CHO NHỮNG LUỐNG
CÓ HỆ THỐNG LƯỚI CHE

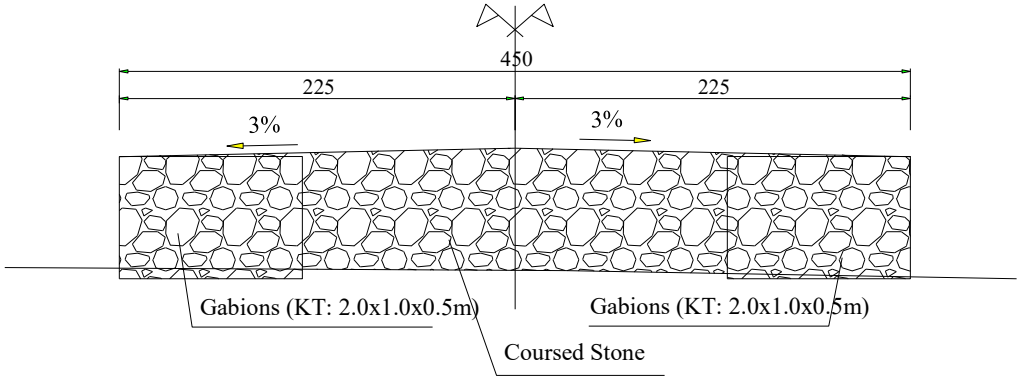
THỐNG KÊ VẬT LIỆU 1 ĐƠN NGUYÊN

IT	TÊN VẬT LIỆU QUY CÁCH	ĐƠN VỊ	SỐ LƯỢNG
1	ỐNG THÉP MẠ KẼM D=21	M	73.5
2	ỐNG THÉP MẠ KẼM D=27	M	26
3	ỐNG THÉP MẠ KẼM D=42	M	24
4	ỐNG THÉP MẠ KẼM D=48	M	06
6	BẢN THÉP 20X20X0,1 CM	CÁI	12
7	MÓNG	CÁI	12
8	LƯỚI CHE	M2	71.5

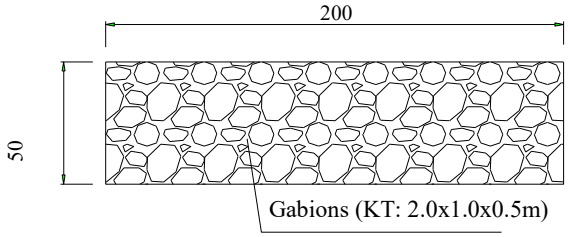
Figure D-6 Typical design of silviculture infrastructure: Forestry Road



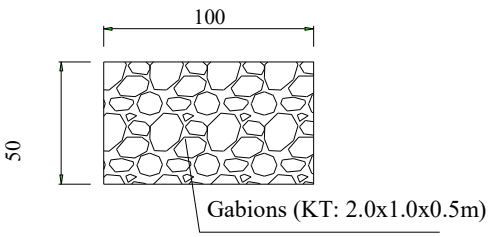
REINFORCING STONE SECTION <SCALE: 1/100>



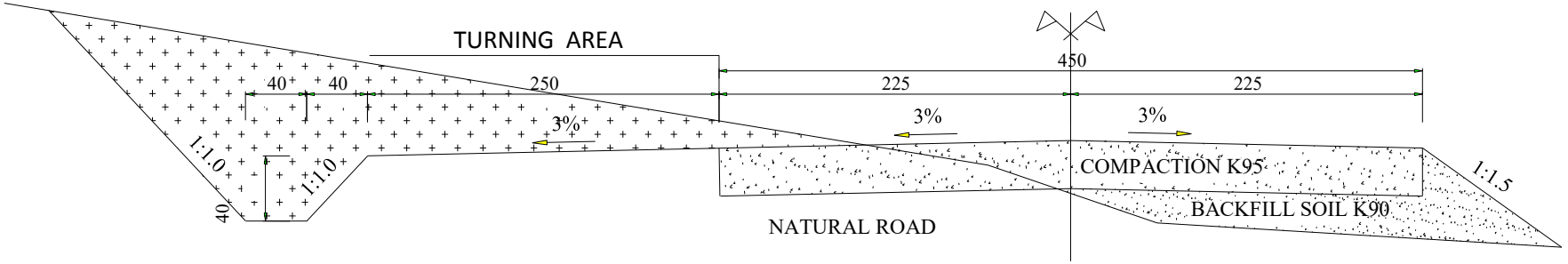
HORIZONTAL GABIONS



CROSS SECTION



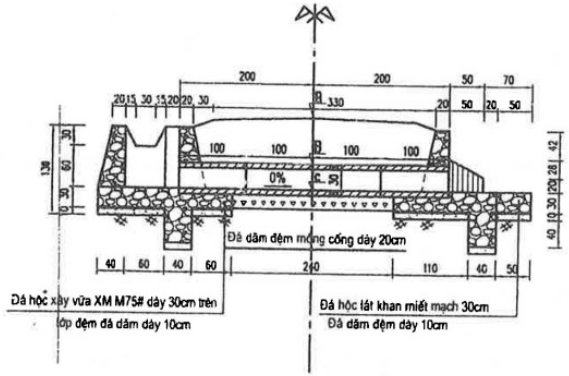
TURNING POINT SECTION <SCALE: 1/100>



TYPICAL CULVERT SECTION

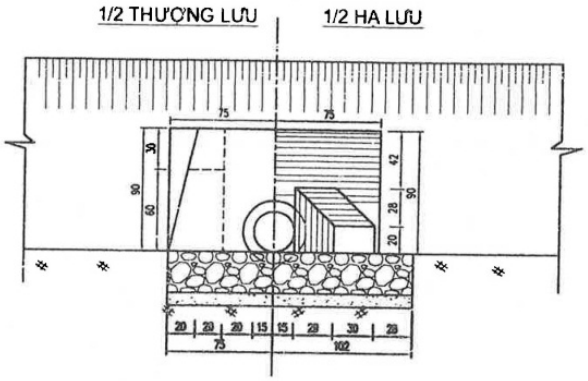
HORIZONTAL CULVERT SECTION

TỶ LỆ: 1/100



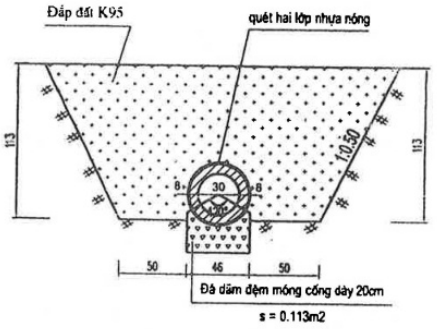
HEAD CULVERT SECTION

TỶ LỆ: 1/50



BODY CULVERT SECTION

TỶ LỆ: 1/50



LAYOUT PLAN

TỶ LỆ: 1/100