Ecosystem Services Certification Document (ESCD) for Huong Son, Viet Nam

Introduction

FSC-STD-60-004 *International Generic Indicators* (IGI) specifies that when a certified forest management organization makes FSC claims regarding the maintenance and/or enhancement of ecosystem services, Annex C is followed regarding additional requirements, including the development of a publicly available Ecosystem Services Certification Document.

In the Ecosystem Services Certification Document, the certified forest management organization shall list the declared ecosystem service(s), state the desired ecosystem service(s) claim, and describe: the status and management of, and threats to, the declared ecosystem service(s); the methodology used to evaluate the impacts of management activities on the declared ecosystem service(s); the results of impact assessment; a list of those involved in activities related to the declared ecosystem service(s); and a summary of culturally appropriate engagement with Indigenous Peoples and local communities.

The Ecosystem Services Certification Document, along with FSC claims for the maintenance and/or enhancement of ecosystem services, can be used to improve market access to ecosystem service payments by increasing the confidence of potential buyers or investors.

The Ecosystem Services Certification Document is subject to assessment as part of a forest management evaluation by certification bodies.

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Ecosystem Services Certification Document for Huong Son, Viet Nam

Part 1: Information regarding the demonstration of impact

Declaration of the ecosystem services for which a claim is being or will be made
Please state the ecosystem service(s) for which you are making or plan to make FSC claims for the maintenance and/or enhancement of ecosystem services. You can choose more than one option. ☒ Carbon sequestration and storage ☒ Watershed services ☒ Biological diversity conservation ☐ Soil conservation ☐ Recreational services

1. Core information regarding the demonstration of impact

Declared ecosystem service (ES)	FSC ecosystem service claim (from Annex I of FSC-PRO-30-002 – ForCES field testing draft)	Associated impact indicator for the claim (from Annex I of FSC-PRO-30-002)	Baseline level of the impact indicator	Verifiable target for the impact indicator	Key management activities and strategies to reduce threats and maintain and/or enhance the ecosystem service	Results of impact assessment (see section 6)
Biological Diversity Conservation	Protect biodiversity (conservation areas)	High conservation value (HCV) area (no	Not required	HCV area (total area for HCV types 1, 3, and 4 is 7,926.03 ha)	• Forest cover assessment • Management planning for protection of forest cover	Total HCV 1,3,4 area 7,926.03 ha

		baseline required)			• Management planning for a number of endangered plant species • Organize activities and archive documents by category (focusing on patrols, protection, and monitoring) • Established teams with participation of the local patrol force and community villages to patrol forest regularly. Monitoring includes forest cover, structure, incidents of illegal hunting and harvesting, and population trends of species (both fauna and flora). All monitoring results are recorded • Encourage community participation in protecting HCV areas • Working with the Communal People Committees, two border posts, and Son Kim 1 and Son Hong communes to identify joint protection and monitoring activities • Develop and sign agreements on coordination of forest protection with local authorities and relevant agencies • Organize and coordinate forest protection patrols with Forest Protection Unit, forest ranger stations, and local government	

Watershed Services	Protect water (maintain forest cover)	Area of natural forest cover (no baseline required)	Not required	100% of the HCV 4 area, which covers 23% of the headwater area of the Song Con branch river of Ngan Pho River	• Forest cover assessment • Management planning for protection of forest cover • Encourage community participation in protecting the HCV area • Working with the Communal People Committee of Son Kim 1 and Son Hong, and two border posts, to identify joint protection and monitoring activities • Developed and signed agreements on forest protection coordination with local authorities and relevant agencies • Organize and coordinate forest protection patrols with Forest Protection Unit, forest ranger stations, and local government	Forest cover maintained in HCV 4 (2,236 ha)

Carbon Sequestration and Storage	Mitigate climate change (maintain forest carbon)	Forest carbon storage (tonnes CO_2)	Total 967,575 tonnes of carbon (3,550,999 tonnes of CO_2)	The amount of carbon conserved because of improved harvesting practices and forest protection	• There is currently a harvesting moratorium on the forest management unit (FMU) until at least 2020
					• If harvesting does commence:
					  ○ harvest plans are designed to follow reduced-impact logging (RIL) practices
					  ○ all HCV areas will continue to be protected from logging
						Target is maintenance, so it is the same as the baseline

					○ any changes in forest carbon will be detected through annual monitoring • Pressures on the forest will be reduced by combining the activities of forest protection and sustainable management with alternative livelihood strategies such as improving home gardens, livestock development, planting native trees, planting rattan	

2. Management objectives related to maintenance and/or enhancement of declared ecosystem services

- Biological diversity: Protect biodiversity through the maintenance of HCV areas.
- Carbon sequestration and storage: Mitigate climate change through the maintenance of forest carbon.
- Watershed services: Protect intact watershed through the intactness of HCV 4 (critical areas for water).

3. Description of the current condition of the declared ecosystem service(s), areas within and outside the management unit that contribute to the declared ecosystem service(s)

Huong Son State Forest Company (SFC) is a state-owned forest concession located in the west of Huong Son District, Ha Tinh Province. This concession shares boundaries with Lao People's Democratic Republic (PDR) and three communes: Son Hong, Son Tay, and Son Kim 1. The company's headquarters is located in Tay Son Town, Huong Son District, 90 km from Ha Tinh City, 110 km from Vung Ang port to the west, and 18 km from Cau Treo border gate to the east. National Highway 8A – an important road connecting National Highway 1A with Lao PDR – crosses the company's area of management, which creates favourable conditions for transporting forest products and goods exchange.

The Huong Son Forest is contiguous with both the established Vu Quang National Park (NP) in Viet Nam and the Nakai-Nam Theun National Biodiversity Conservation Area (NBCA) in Lao PDR (Timmins and Viet Cuong, 1999). Huong Son Forest is a vital link at what is probably the weakest point in a huge contiguous conservation area network of forest habitat. Protecting this link is crucial since at no other point in the NBCA areas is exploitation of natural resources so directly concentrated at adjacent points across the Viet Nam–Lao PDR border. Preservation of the Huong Son Forest will go a long way towards maintaining continuity of forest communities between the northern and central units of the Northern Annamites Protected Areas Complex (NAPAC) along the Annamite spine.

The site was once 38,000 ha and was split into two: one Protection area managed by Ngan Pho Forest Management Board and one concession managed by Huong Son State Forest Company. The level of exploitation of natural resources in Indochina means that large blocks of forest habitat are generally significantly richer in biodiversity than small, easily accessible areas. Given that conservation efforts are generally limited by resources, in principle at least it is better to concentrate on a small number of large areas to optimize natural protection. A survey of biodiversity in the natural forests of the Annamite recorded 1,381 species of vascular plants, 77 species of mammals, 217 species of birds, 24 species of amphibians and reptiles, 81 species of fish, 60 species of aquatic plants, and 545 species of insects (Timmins and Viet Cuong, 1999). There are many rare, threatened, and endangered species present in the natural forest areas of the company's concession that should be protected (Timmins and Viet Cuong, 1999). Conservation of Huong Son Forest contributes to conserving populations of very large mammals (wild cattle *Bos/Bubalus*, Asiatic Elephant *Elephas maximus*). In the areas of HCV types 1, 3, and 4, there are no commercial harvesting activities taking place. In other areas, there is low-intensity collection of non-timber forest products (NTFPs).

The Huong Son Forest provides protection for three of the six branch rivers of the Song Ngan Pho River, namely the Con, Rao Mac, and Rao Qua rivers. The catchment area within the concession covers about 30% of the total catchment area of the Ngan Pho River. As in other Vietnamese lowlands, irrigated rice cultivation dominates the landscape outside of the forest. The area also provides water resources to Huong Son District.

Some 51% of the upper watershed area of the Con River is managed by Huong Son SFC. The 2,236 ha identified as HCV 4 is located in a headwater area with very steep slope (>35°), has dense rich, evergreen intact forest, and is about 20 km from the border with Lao PDR. It covers about 10% of the total FMU (upper watershed) and 23% of the Con River catchment, which is the largest catchment in Huong Son District. In the HCV assessment, HCV 4 is identified as the most important area to protect the river, regulate the water, and to mitigate flooding. The other 49% of the watershed area is in the catchment and downstream areas belonging to plantation companies and communes, where the natural forest has not been protected and some areas are already covered with plantation or agriculture land. HCV 4 area is the area claimed to provide watershed services in Huong Son. There is no commercial use of water in the site. In the *Water Risk Atlas*, most of the Huong Son site is considered low to medium overall water risk, except for a small part of the HCV 4 area with medium to high risk (WRI, nd-a). The regulatory and reputational risks range from medium to high (WRI, nd-b).

Carbon has been monitored in Huong Son since 2014; the site is seen as having great potential for carbon sequestration and storage, as some areas have been protected and intact for a long time (e.g. uphill areas), while others are being restored as a result of RIL practices and, more recently, the ban on timber harvesting. Other programmes (e.g. United Nations Programme on Reducing Emissions from Deforestation and Forest Degradation [UN-REDD]) have acknowledged this area as a potential site, indicating that carbon is an important service for the site.

The forest map and forest management plan are annexed to this certificate for the selected ecosystem services. Management objectives related to maintenance and/or enhancement of the declared ecosystem services are:

- Biological diversity: to protect biodiversity through the maintenance of HCV areas.
- Carbon sequestration and storage: to mitigate climate change through the maintenance of forest carbon.
- Watershed services: to protect the watershed intactness of HCV 4 area (critical areas for water).

4. Threats to the declared ecosystem service(s) within and outside of the management unit

The site has two major threats, which could affect all three ecosystem services: carbon sequestration and storage, biological diversity, and watershed services.

1. Illegal exploitation of valuable (not only economically) tree species and hunting.

To mitigate this threat, the company aims to: coordinate with local forest rangers, forest ranger stations of the district, and the local government in the management of social protection of HCV forests; discuss specific problems and solutions, and implement related activities; and raise awareness of staff and communities on the importance of biodiversity and forest conservation.

2. Reduced forest cover and degradation of the forest due to natural disasters and hazards such as flooding.

Flooding often happens in the rainy season from September to January. In the watershed area, the forest may be destroyed and soil eroded. Flooding can also destroy the road and bridge, and block access to the forest.

Increasing flooding events may cause a reduction in forest cover (trees falling or otherwise dying) that may reduce the carbon stock of the area. Excessive floods may also disturb biodiversity and destroy habitat.

The first threat will be mitigated by supporting livelihoods, for example by combining the activities of forest protection and sustainable management with other livelihood strategies such as improving home gardens and livestock development. The forest structure will be improved by enrichment planting with native trees, and planting rattan in order to strengthen the protection function of the forest. Fragile ecosystems such as riparian forest will be strictly protected.

The second threat is more difficult to mitigate as natural disasters are out of the control of the management. However, since 2013, there has been no harvest in the area and current management activities aim to preserve the forest cover, which should mitigate against the impact of natural hazards such as flooding.

5. Description of the methodology used to demonstrate the impact for each selected claim (including more information on baseline if necessary)

Biological diversity conservation

A forest inventory approach will be used to check the forest area (in HCV types 1, 3, and 4) in the future, whereas earth observation data was used to assess historical forest cover change. A rapid assessment of biodiversity will be integrated into the periodic inventory. The first rapid assessment was carried out 2015 in 20 transects (from 0.5 to 3 km long) distributed in the whole forest area to establish the baseline. Changes in forest cover,

fauna, and flora are monitored in those same 20 transects by monthly patrols. The forest protection unit – with the participation of relevant stakeholders such as representatives of communities, communes, border guard officials, and forest rangers – will patrol the area.

Watershed services

The relationship between land use and hydrology is complex, and established wisdom about their nature can also change over time. The following patterns are relatively well established (Asquith and Wunder, 2008; Bruijnzeel, 2004).

- Intact natural vegetation cover guarantees optimum stream flow under given geo-climatic conditions. It also affords maximum soil protection and therefore provides optimum regulation of seasonal flows while moderating erosion and stream sediment flows.
- Removal of old-growth forest on a large scale (> 10,000 km^2) in humid parts of the world reduces rainfall during the transition between rainy and dry seasons. Annual average effects are modest (5–10%), but are higher during the transition.

Thus, the planned HCV 4 area should have a positive impact on the watershed services if no deforestation or forest degradation occur.

Periodic inventories will be carried out to check forest cover (in HCV 4 area) and regular monitoring will be carried out by patrols. Monitoring indicators are natural forest cover, forest structure, and number of incidents of illegal hunting and harvesting.

Carbon sequestration and storage

The participatory carbon monitoring tool, developed by SNV, and forestry inventory are used to measure maintenance of carbon pools. Originally, sample plots were randomly assigned on the map. In all the plots, forest trees and biomass are measured. Detailed description of the methodology is given by Bao Huy et al. (2013).

6. Detailed results of impact assessment and monitoring

Biological diversity conservation

Although selective logging has occurred in the FMU, the unit is still largely unfragmented with only minor changes in forest cover between 2002 and 2012 within the Huong Son (ESA, 2013). The 2012 inventory of the natural forests of the Annamite recorded 1,381 species of vascular plants, 77 species of mammals, 217 species of birds, 24 species of amphibians and reptiles, 81 species of fish, 60 species of aquatic plants, and 545 species of insects. Many rare, threatened, and endangered species are recorded in the natural forest areas of the company, which should be protected. According to the biodiversity survey of the Forest Certification for Ecosystem Services (ForCES) project field teams and rapid assessment in 2015, the HCV 1, 3, and 4 of 7,926.03 ha are protected and habitat is kept in good condition, with no further fragmentation. There has been no negative change in flora and fauna composition.

Carbon sequestration and storage

The total area of the Huong Son State Forest Company is 19,745.6 ha. Historically, only minor changes in forest cover have occurred between 2002 and 2012 (ESA, 2013). Carbon monitoring in 2014 showed a total 967,575 tonnes of carbon reserves (3,550,999 tonnes of CO_2). This was made up of 13,555.3 ha of production forests (625,717 t C, 2.29638 Mt CO_2), and 6,190.3 ha of protection forest (341,858 t C, 1.254619 Mt CO_2). That can be used as baseline data for the next monitoring period. Absence of logging in the FMU and preventing illegal logging will maintain the forest carbon stock. In the management plan, the designed RIL and enrichment planting will help to ensure the carbon stock maintenance, in case harvesting permission is granted in the future Timber harvesting is very unlikely under current legislation of Vietnam (a ban on natural forest is established until 2020), but if harvesting is allowed, carbon monitoring will have to demonstrate maintenance of carbon stock at the surveillance following the first harvesting operations.

Watershed services

The Huong Son Forest provides protection for three of the six branch rivers of the Song Ngan Pho River, namely Con, Rao Mac, and Rao Qua rivers. Some 51% of the upper watershed area of the Con River is managed by Huong Son SFC, 100% of the natural forest still exists in this watershed. The HCV 4 is located in headwater area, with 2,236 ha of intact forest. The other 49% of the watershed area is in the watershed and downstream, in areas belonging to plantation companies and communes, where the natural forest has not been protected and is already degraded, converted to plantation or agriculture land (see Figures 1 and 2).

The main impact indicator is to ensure that there is no negative impact in the forest area (detail monitoring indicators are natural forest cover, structure, number of violations of illegal hunting and harvesting). Only minor changes in forest cover have occurred between 2002 and 2012 (ESA, 2013). Inventory and monitoring will be used to ensure no changes in forest cover, and 2,236 ha of HCV 4 will be kept intact.

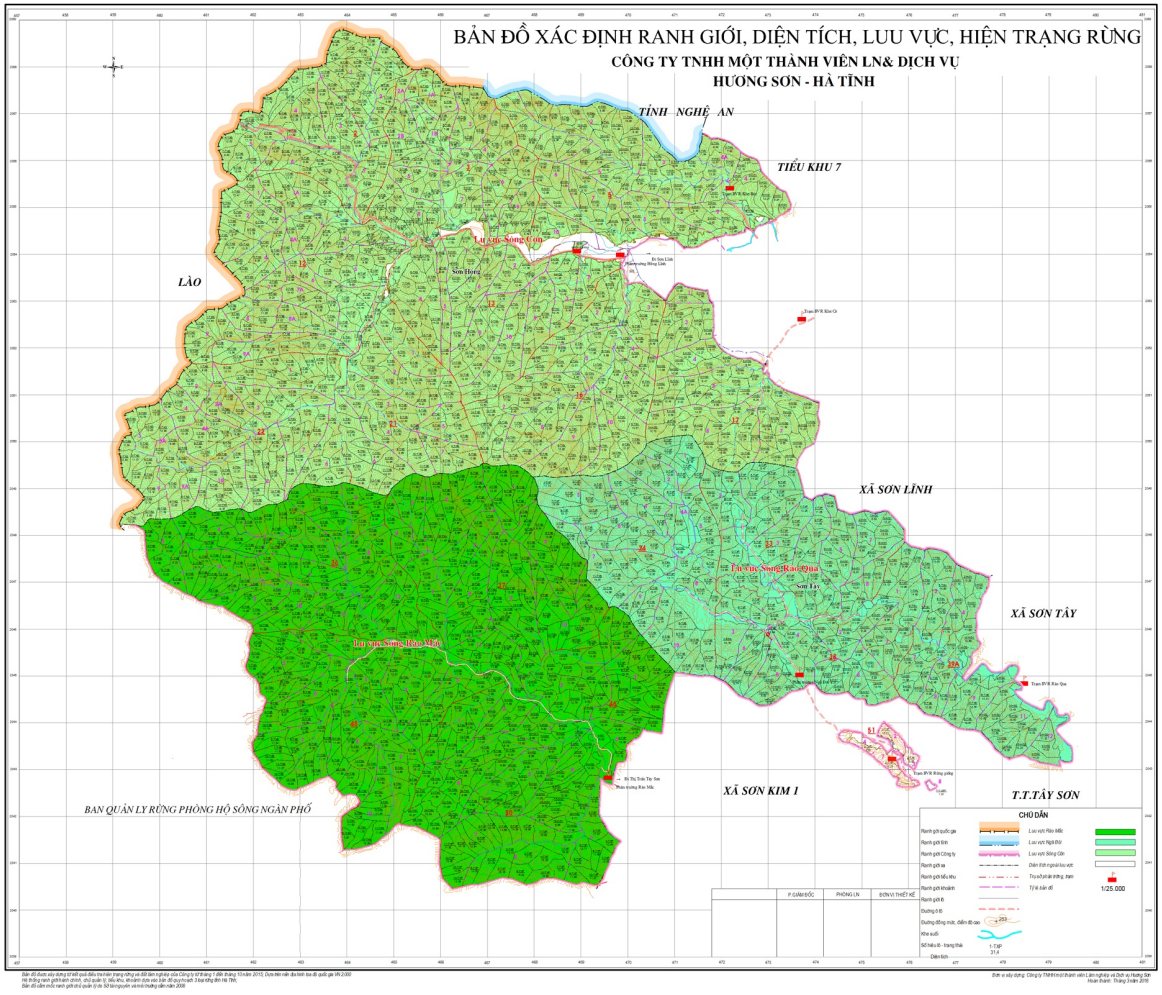


Figure 1. Huong Son watershed, Viet Nam

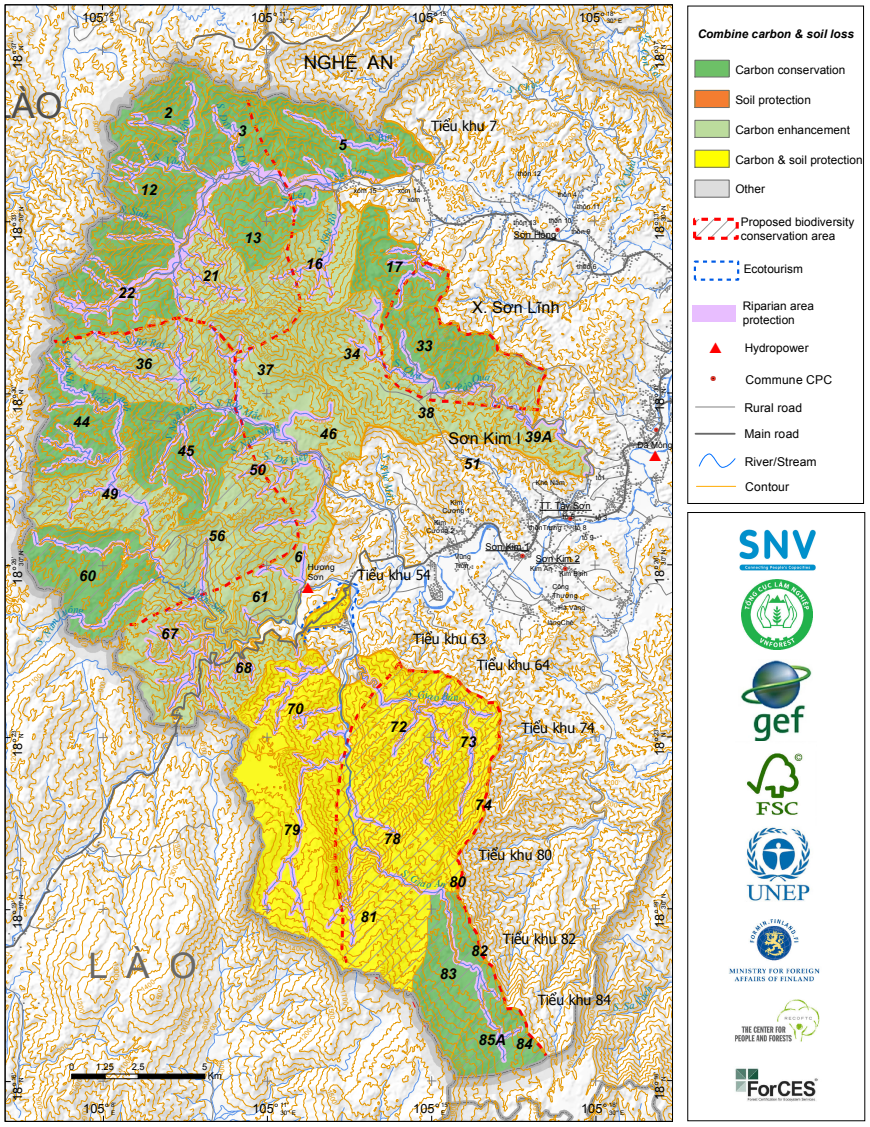


Figure 2. Ecosystem service map by compartment

Part 2: Management information

1. Name of the Organization

Huong Son State Forest Company

2. Location of the management unit

Tay Son town, Huong Son District, Ha Tinh Province, Viet Nam

Latitude: 18°27'35.20"N

Longtitude: 105°18'11.25"E

3. Type of certification

Please tick all the options that apply to the management unit:

Size:

☐ Large scale ☒ Conventional ☐ SLIMF (small and low-intensity managed forest)

Type of organization certified:

☐ Individual ☐ Private company ☒ Public organization ☐ Indigenous Peoples ☐ Local communities ☐ Management group

4. Characteristics of the certificate

Please give the following information:

Management unit area (in hectares): 19,903.69 ha

Number of members (if applicable): 1

FSC Certificate Code: GFA-FM/COC-002643

First issue date: 10 November 2016

Last issue date: 10 November 2016

Expiry date: 9 November 2021

5. Organization contact information

Please provide relevant contact information:

Email: Binhch9lnhs@yahoo.com

Postal address: Huong Son Forestry Company, Tay Son town, Huong Son District, Ha Tinh Province, Viet Nam

Telephone number: +84 91269691 or +84 982249195

Contact name: Pham Nguyen Binh

6. Legal tenure to manage and/or use the forest, or other legal right to receive payments for declared ecosystem services

Ownership as stated in the management plan: Huong Son company has a 'red book' issued by the responsible governmental institution to certify the management rights of the company.

Although carbon, water, and biodiversity are services mentioned in Degree No. 99/2006/TT-BNN, dated 6 November 2006, on guiding the implementation of a number of provisions of the Regulation on forest management, there is a detailed payment mechanism available that also applies.

The payment will be used for protecting the natural forest area and sustainable management of the forest, as well as improving the selected ecosystem services.

7. List of communities and other organizations involved in activities related to the declared ecosystem service(s)

Huong Son Company: has management right to utilize and manage the forest per the 'red book'. The company has seven protection units that patrol across the whole area to protect and conserve the forest.

Operational areas of the company are located on the administrative border of four communes and a town, but some villages and the town are located in the most distant areas of operation of the company. Only three villages of Son Kim 1 commune and one village of Son Hong commune are located near the company's management.

To manage forests to ensure economic, social, and environment sustainability, the company forest management plan includes support to planning of community-based forestry in the forest areas close to communities, especially for three villages in the commune of Son Kim 1 and one village in Son Hong commune.

Ngan Pho Watershed Protection Management Board: collaboration in forest protection activities in the upstream area and the protection of the forest area next to Huong Son Forest.

The forest rangers, border patrols (Vietnamese and Laotian): involved in forest protection and conservation. They are subcontracted by the company to make patrols per the sustainable forest management (SFM) plan based on needs and to cooperate with the company to handle violations.

8. Summary of culturally appropriate engagement with Indigenous Peoples and local communities, related to the declared ecosystem service(s) – including ecosystem services access and use, and benefit sharing – consistent with FSC Principles 3 and 4

The rights are held by Huong Son State Forest Company. Timber harvesting has been stopped since 2013 by decision of central government to suspend timber harvesting in natural forest. The company does not own any plantation area, only naturally regenerated young forest. It is now conducting the monitoring work, and protecting the natural forest; and does not have any activities that negatively affect the communities.

Communities living around the FMU: There are no Indigenous Peoples, but there are some communities living in the areas surrounding the company's forest area. They do not have legal right to access the forest. However, they sometimes collect NTFPs from the forest, and the company allows them to collect limited amounts. As yet, no payment for ecosystem services has been made and no mechanism has been developed to officially allow use of NTFPs and other ecosystem services.

Biodiversity: Local communities collect NTFPs (including medicinal plants) on a small scale for subsistence use.

Watershed service: The communities will benefit both from the water (for irrigation and drinking) and from the protection against flooding and natural disasters.

So far, there have been few conflicts with national laws regarding implementing free, prior, and informed consent (FPIC).

References

Asquith, N., and Wunder, S. (eds) (2008) *Payments for Watershed Services: The Bellagio Conversations*. Fundación Natura Bolivia, Santa Cruz de la Sierra, Bolivia. (Also available at http://www.cifor.org/pes/publications/pdf_files/Bellagio%20Conversations%20PWS%202008.pdf, accessed 1 May 2017).

Bao Huy, Nguyen Thi Thanh Huong, Benktesh D. Sharma and Nguyen Vinh Quang (2013) *Participatory Carbon Monitoring: Manual for Local Technical Staff*. SNV Netherlands Development Organisation, Ho Chi Minh City. (Also available at www.snv.org/public/cms/sites/default/files/explore/download/pcm_manual_for_technical_staff_final_en-1.pdf, accessed 1 March 2017).

Bruijnzeel, L.A. (2004) Hydrological functions of tropical forests: not seeing the soil for the trees? *Agriculture, Ecosystems and Environment* 104: 185–228.

ESA (2013) *Earth Observation for Ecosystem Services Valuation*. European Space Agency, Paris.

Timmins, R.J. and Viet Cuong, T. (1999) *An Assessment of the Conservation Importance of the Huong Son (Annamite) Forest, Ha Tinh Province, Vietnam, Based on the Results of a Field Survey for Large Mammals and Birds*. Center for Biodiversity and Conservation, American Museum of Natural History, New York, USA. (Also available at http://bulletinsdistribution.amnh.org/content/download/37586/555649/file/timmins.pdf, accessed 17 April 2017).

WRI (World Resources Institute) (nd-a) Aqueduct Water Risk Atlas – Overall water risk (current conditions). www.bit.ly/2hBriv8 (accessed 1 March 2017).

WRI (World Resources Institute) (nd-b) Aqueduct Water Risk Atlas – Regulatory & reputational risk (current conditions). www.bit.ly/2hBsKgO (accessed 1 March 2017).

The following referenced documents are relevant for the application of this document. For references without specific version number, the latest edition of the document (including any amendments) applies.

FSC-STD-01-001 V5-2 EN *FSC Principles and Criteria for Forest Stewardship*

FSC-STD-01-002 *Glossary of Terms*

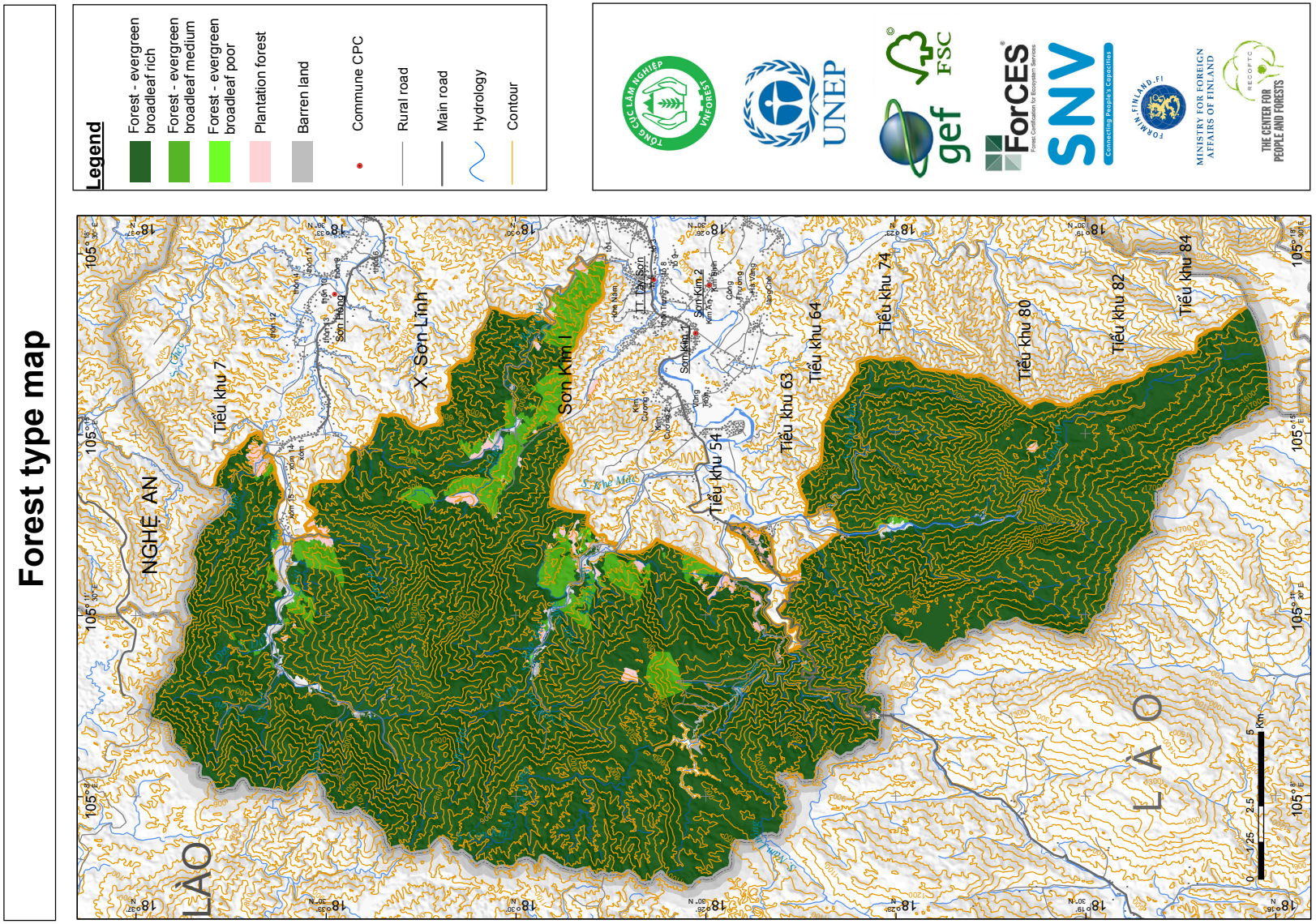
FSC-STD-50-001 *Requirements for Use of the FSC Trademarks by Certificate Holders*

FSC-STD-60-004 *International Generic Indicators*

FSC-PRO-30-002 *Demonstrating the Impact of Forest Stewardship on Ecosystem Services* (field testing draft)

FSC-PRO-60-006 *Development and Transfer of National Forest Stewardship Standards to the FSC Principles and Criteria Version 5-1*

Annex 1: Forest map of Huong Son



Annex 2: Sustainable Forest Management Plan, Huong Son Huong Son State Forest Company (2016–2050)

Socialist republic of Vietnam

Independence - Freedom – Happiness

Sustainable forest Management Plan

Huong Son Huong Son State Forest Company.

(Period of 2016 - 2050)

CONTENT

HA TINH PPC

HUONG SON FORESTRY & SERVICE COMPANY

SOCIALIST REPUBLIC OF VIETNAM
Freedoom – Freedoom – Happiness

NO.: BC/Cty-LN

Huong Son, March 29th, 2016

SUMMARY

Sustainable forest management plan of Huong Son Forestry & Service Company

(Period of 2016 - 2050)

Implementation of Circular No. 38 / TT-BNN isssued on March 11th, 2014 of the Ministry of Agriculture and Rural Development, guiding how to develope sustainable forest management plan;

Based on the ability on land; forest resources and the existing capabilities of the company, in order to support for effectively business and production activities, to promote comprehensively potentials of forests and forest land; Huong Son Forestry

and Service Company has developed the sustainable forest management with the following basic contents:

1. Brief about the Company .

- Huong Son Forestry and Service Company is located western of Huong Son Distict, Ha Tinh Province, belongs to administrative boundaries of the communes: Son Hong, Son Tay, Son Kim 1. The Company headquater is located on Tay Son Town, Huong Son District, Ha Tinh Province

2. Currently status about management and productive operation.

- The total areas of forest managed by Huong Son Company is 19.903,69 ha, with 19 compartments. The area of land types are following details:

* Toal forested land: 19.316,31 ha, with forest coverage is from 0,6-0,8. Total reserve of 1.972.070 m^3, with 10.854 thousand of bamboo trees

+ Natural forest 19.125,09 ha, account for 96,09 % of total area, with the reserve of 1.960.717 m^3 including:

Rich-timber forest: 1.174,69 ha, average reserve of 240 m^3/ha

Average- timber forest: 7.107,79 ha, average reserve of 137 m^3/ha

Poor - timber forest: 4.614,40 ha, average reserve of 84 m^3/ha

Very poor - timber forest: 226,08 ha, average reserve of 26,9 m^3/ha

Young - timber forest : 1.385,68 ha, average reserve of 90 m^3/ha

Mixed timber-bamboo forest 2.636,71 ha, average reserve of 55 m^3/ha, with 5.057 thousand of bamboo tree.

Mixed bamboo-timber forest 1.979,74 ha, average reserve of 22 m^3/ha, with 5.798 thousand of bamboo tree.

+ Planted forest 191,22 ha, account for 0,96 % of nature area

* Non-forested land – planned for forestry: 392,51 ha, account for 1,97 % of nature area.

* Other land: 194,88 ha, account for 0,98 % of nature area

3. Advantages, existing problems on management and productive oppertation.

3.1. General assessement and existing problems

In recent years, Huong Son Company has done the forest management, protection and use of forests well. The survey results show that forest coverage reached 96.1%, havesting reserves reached 174 m3/ ha. However, the current forest management is unsatisfactory as comparable as 10 principles of FSC^{TM}. Improvement needs to be done to ensure sustainable forest management on all 3 aspects: social, economic and environment. Specifically, the following shortfalls need to overcome in the next cycle:

- The Company do have Design Investigation Team to monitor, record and assess forest resources. However, this work was done once every 5 years only, so it is difficult to timely update the quality of forest resource;

- Some households living near the forests have low qualification, limited awareness of forest benefit; agricultural land per capita is low, life depends mostly on forest products, hence, illegal logging is still common; though such occurrence is at small scale but sophisticated, which makes it difficult to detect. Generally speaking, violations was strictly and promptly handled by the Company and relevant authorities;

- The demand of forest products for construction purpose, the benefits sharing between forest owners and local communities are still contradicted. Economic benefits from forests where workers and local communities should be entitled to is not commensurate with the labor intensity and investment to protect and develop the forests;

- The forest area put into exploitation is rich and well reserved, it is categorized as production forests. The logging follows the regulations as indicated in the Decision No. 40/2005/QD-BNN-LN dated 7/7/2005 of the Minister of MARD and the Circular No. 87/2009/TT-BNNPTNT dated 31/12/2009 of MARD relating to the guidance to design and exploit natural forest. However, rich, exploitable forest often locate in high, remote, uneasy conditions. It made it difficult for transportation and impede the efficiency of business;

- Due to the application of selective logging method, the quantity of high economic valued plants has been decreased, causing difficult for the subsequent rotation; As a result, an issue arisen is that even though forest has rich reserve, exploitation is not doable because of the fact that for plants with low commercial value, once exploited and shipped, the finished product would cost much higher than selling price;

- So far, management was only focused on economic benefits, but less on social and environmental protection objectives. This can be seen in the fact that when developing the plans for forest management, the social and environmental impact has yet been carefully evaluated, so the developer failed to recommend the most feasible measures for forest management.

- The effect of business on a unit of forest area is not high;

- The approach to sustainable forest management of Company staff members and residents in the area is limited.

- The above mentioned shortfalls has led to detrimental role of forest and environment protection; living standard of workers is not high, local socio-economic conditions are slowly developed, failing to keep up with the economy in the market and the region.

3.2. Identify the reasons of of shortcomings

Reasons for reducing forest area:

- The forest land area allocated to the Company was reduced due to the decision of People's Committee of Ha Tinh to withdraw some forest land to build hydroelectric power, to allocate to centres and households. The area managed and protected by the Company has been increasing by years because it always gives top priority on protection of forests and builds an effective system of forest protection. Also, each year, silvicultural solutions are applied such as forest enrichment, zoning and regeneration in poor quality areas.

Forest degradation is due to the following reasons:

- Due to the long application of selective logging method, trees of economic value become exhausted. In Huong Son Forest, valuable woods such as Lim Xanh, Gioi, Re, which were previously common, now however, almost no large-diameter trees can be found for logging;

- Life of people in the surrounding area is very difficult. Their attitude towards forest protection and development is poor. Illegal logging with sophisticated manipulation still exists. Timber and forestry products traders are found more in many localities while protection force of the Company is not strong enough. The terrain conditions, the lack of supporting instruments and powerful role makes it uneasy to work;

- There is high demand for timber, land for production and grazing areas from Company staff members and people in the area.

4. The necessity to developing the sustainable forest management plan (SFMP).

Judging from the situation described above, it is seen that a proper plan for sustainable forest management is essential. Successful development of "sustainable forest management" plan will contribute an important part to protect the forest, the environment, to conserve biodiversity, to create jobs and raise incomes for local people, leading to sustainable forest resources.

5. Objectives of SFMP.

5.1. Economic

To develop plans for sustainable forest management, to promote the growth and development of forest by applying appropriate silvicultural measures for each plot, sub-compartment, compartment. On that basis, to enhance the reserve and quality of forests, to stimulate forest growth, so as to supply more than 3.125 m3 of larger timber / year and 520 m3 of ultilized timber/ year. Non-timber products such as rattan, bamboo and medicinal plants will be consumed in the local area and for export, hence, it will generate higher economic efficiency while maintaining the stability and growth of the forest. Details including:

- Intensive plantation area, expected for the cycle is 2111.07 ha, the average productivity of plantation is expected to reach from 80 to 110 m3 / ha.

- Poor quality natural forest area will be regenerated by silvicultural measures. These are positive solutions to contribute to improve the vegetation coverage, to enhance forest reserves, to strengthen protection capacity, and to improve soil condition. These are solutions to the aim of sustainable land use.

- The Company's annual sustainable harvested product, estimated for the rotation of 35 years is 109.398,28 m3 large timber, 18.233,05 m3 utilized timber. Averagely for the whole rotation, each year around 3.125 m^3 of large timber and around 520 m^3 ultilized timber will be logged. This contributes to the basic needs for materials processing, construction and consumption in the area.

5.2. Social

- In reviewing the area managed by the Company, to accommodate the demand of agricultural and forestry production in the area in the form of forest contract to individual households.

- To meet a part of the demand of timber and forestry products for the residents living nearby, to solve the conflicts between the Company and local communities.

- Each year, to create sufficient jobs for 350 workers and employees of the Company, to attract about 300 workers in the area in the form of seasonal contracts. To contribute economically and socially to the local area, to increase income for people; to implement well the community forestry policy, to contribute to stabilize national defense and security;

- To train workers and communities on professional forest management, afforestation, tendering and harvesting.

- To develop infrastructure, inter-communal, village roads; to arrange good service to ensure convenient consumption of the products.

5.3. Environment

- To protect, develop forest, to increase forest coverage from 96,1 % đến 98 %.

- To focus on planting 2.111,07 hectares of forests, to improve poor forest by planting 905,38 ha of economic forest. To increase the protection capacity, to contribute to protect water resources, to prevent soil erosion and to minimize natural disasters in the area.

- To protect biological diversity, some rare and valuable species and endangered animals.

6. Clarify the high conservation value forest (HCVF)

6.1. Area of HCVF

Basic criteria to be considered when proposing the areas as: natural habitat or semi-natural habitat, a high diversity, focusing more valuable species or endangered species conservation, demand urgent or feasible in practice conservation. There are 4 areas proposed for conservation, that is:

** Area surrounding to communes: 3 Son Tay, Son Hong and Sơn Kim 1:*

The area covers 5896.1 hectares including secondary forest areas - photophilic and moisture on the hillsides on compartment No. 16, 17, 34, 37. Subjects of conservation: watersheds, habitat of animal, soil protection; Plants: Sen dua, Ma Nang (Cho water), De cuong dai; Asian Elephant; Bird: Ga loi lam duoi trang, Argus; Reptiles: Cobra Princess. This is area of the wild elephants in Huong Son has adapted and habitual residence for more than 10 years, have friendly relations with the community. This

relationship create conflicts because people from other places go to shoot elephants, and may create damage for the local community in the near future.

** Uptream area of river branch and long to Rao Mac river's banks:*

Foothills includes compartment No. 2, 12, 21, 22, 37 – small area of only 646,5 hectares. Habitat characteristics of secondary – closed forests, evergreen along the stream's blanks, the valley (protected forests along rivers and streams). Objects Conservation: Plants: Ma Nang (water carriers); Animal: striping-Rabbit; Birds: long-beak Babbler; Fish: Ca chinh hoa, Ca mat vang

** Dang Man mountainous area*

Including Compartment No. 10; sub-compartment No. 45 and sub-compartments No. 50 with the area of 1,580 ha. Conservation objects: tropical-rain- moist-evergreen on the flat valley - mountain region (protecting watersheds and biodiversity). The conservation value species: Plants: Sen dua; Animal: Bao gam, Mang lon; Birds: Ga loi trang, Ga loi lam duoi trang, Tri sao, Boi ca lon, Khuou mo dai; Ran ho mang chua; Fish: Ca lau, Chinh hoa, ...

** The western area of Son Hong commune which belong to upstream area of river branch to Viet-Lao border*

Total area: 1,907 ha belong to Compartment No. 3, 2, 12, 22 of Son Hong Commune (protecting HCVF). Conservation Objects: Evergreen-moist-subtropical broad-leaved dominant on the slopes and mountain thunderstorm, loamy; The main conservation value species: Plants: Ken ken, Sen dua, De cuong dai; Animal: Mang lon, Saola; Birds: Ga loi lam duoi trang, Tri sao; Fish: Ca mat vang; Reptiles (Gecko, o ro vay, Ran ho chua, Rua hop tran vang).

6.2. Area of business forest

Criteria to be applied when implementing the forest business planning are:

- Business forests which are protection forest;

- Forests which not belong to HCVF

- Fully meet technical standards (status quo, forest conditions, growth, production forest reserves ...) policy and legislation on forest protection and development planning at the moment;

- The forest business does not affect the hight conservation value, landscape and ecology of the surrounding area.

** Planned area for selected logging:*

On the basis of the legal basis and technical standards to determine the selected harvesting areas and planned-harvested areas of the Company with the scale of 5238.43 ha in the Compartment No. 2, 3, 12, 13 , 16, 21, 22, Son Hong commuen, and the area of Compartment No. 36, 45, 50 of Son Kim 1. Commune. The harverested production are: large timber 109,398.28 m3; ultilized timber 18233.05 m3; fuel wood 9116.52 (details expression: 08 - logging plan);

** Area for improvement of big timber forest for long term bussiness.*

Subjects to implement forest regeneration is poor natural forests and mixed forests which is highlyy degraded, or can not regenerated by other silvicultural measures. Subjects need to improve, to plan big-timber trees for long term business of the company with the area of 905.38 ha belong to Compartment No. 5, 13, 16, of Son Hong commune; Compartment No. 34, 38, 39A of Son Tay Commune; Compartment No. 45 , 46, 50 of Son Kim 1 (for details see the table No. 12 - forest improvement plan).

** Plantation forest (Semi –natural forest).*

Subjects to implement afforestation are bare land Subject 1, Subject 2 which have no inability to regenerate into forests, with suitable natural conditions for planting and replanting forests for ready-harvested forest. Bare-land for afforestation is 338.95 ha. Intensive forest plantation area in the cycle is: 2111.07 ha.

** Area for regenration of natural forest.*

Subjects for regeneration are natural-productive forests under state of poor forest wiht necessary requirements for forest regeneration according to procedures No.14-92. The area for regeneration are 5287.74 hectares of forest maintenance, details see the 10 - forest regeneration plan.

** Area for bussiness and supporting for communities on sustainable NTFPs harvesting.*

Đối tượng để thực hiện sản xuất kinh doanh và hỗ trợ cộng đồng khai thác bền vững lâm sản ngoài gỗ là rừng tự nhiên thuộc các trạng thái giàu, trung bình, nghèo và hỗn giao được quy hoạch cho sản xuất, tổng diện tích đưa vào quy hoạch khai thác lâm sản ngoài gỗ là 10.321,1 ha. (chi tiết xem biểu 15 - kế hoạch khai thác lâm sản ngoài gỗ).

** Area for the nursery for 2 sepcies: Cong Trang and De Khu from natural forest.*

Sbjects are productive-natural forest - restoration evergreen forests with the high rate of Cong Trang, De on the Stand. Subjects for planning of forest converting for seedling purposes complying with the conditions of normative No. 16-93 - technical normative to convert seeding forests. Area of seedlings are 100 hectares belong to Compartment No. 3, 12, 13, forest division: Hong Linh Hong Son.

** Agro-forestry area.*

Subjects in the planning of production agroforestry is an area of land pulses and deposition along streams, vacant land, land with poor natural forest severely degraded and no longer able to regenerate the forest. The planning for agroforestry does not affect the conservation area and the planning area and production. The area included in the planning of production agroforestry is 303.7 ha of production purposes agroforestry is growing medicinal plants and construction of large livestock farms, cows ...

Business producing area for timber, non-timber forest products and agroforestry production is organized every activity management, protection, development of forests and forest use of forest land in accordance with the principles and criteria of the FSC™ sustainable forest management, according to the current law of the State of Vietnam and the production plan of the company.

7. Planning for land use.

Based on the forest area, forest land and objectives and tasks of the Company. The plan is planned as follows:

Total nature area: 19.903,69 ha, including:

** Planned forestry area:* 19.600,0 ha;

- Planning protected areas13.017,2 ha;

+ Land protection: 4.567,2 ha;

+ Protecting watersheds: 3.549,0 ha;

+ Protection along rivers: 646,5 ha;

+ Protection of HCVF: 1.907,2 ha;

+ Protecting the habitat of animals: 2.347,4 ha;

- Planning the production areas:5.582,8 ha;

+ Area of natural forest logging: 5.238,4 ha;

+ Forest regeneration areas, intensive plantations: 1.244,3 ha;

+ area converted seeding forests: 100 ha;

+ Area for NTFP harvesting: the organization of production across the entire planning area for the production.

* *Planned agriculture area:* 303,7 ha

- Planned area for fruit trees, medicinal plants: 217,8 ha;

- Planned area for pig farms, cows: 86 ha.

8. Sustainable production and bussiness plan

8.1. Forest protection

* Protection plan to protecting rare specices

- Through surveys and consultation with stakeholders, reference documents by national and international experts, the Company have made a list of rare plant and animal species which need to be protected including 26 plant species and 22 animal species. The list is included on sustainabe forest management plan.

- Protection methods: Popularing the list of those species of rare plants, endangered which should be protected for the people, students at local schools in the area. These species are distributed mainly in the watershed areas, do not logging in these areas to advoid their habitat. Propagandaing and mobilizing local people to understand important issues about the animals and not killing them. Establishing boundary signs/markers which show clearly about the prohibited of hunting areas ...

* Preventing forest from illegal logging and invasion

The area is need to be protected in the whole cycle: Priority areas is bordering residential areas, near roads which is need to enhance patrol and protection. Through the survey, a total identified area of protection should be strengthened in the whole cycle: regularly protected area is 19903.67 ha; The area of HCVF is 13017.2 hectares; The planed area for forest production is 6582.8 hectares; the planned area for agroforestry production is 303.7 ha.

* *Implementation approaches:*

- Assigning the forest protection and management department to manage the whole Stand, control forest protection, forest fire prevention, pest control;

- Assigning to specific locations for each forest protection station; organizing the network for checking, monitoring to detect in time the incident occurred.

- There should be closely collaboration between the company and local authorities, border guard forces stationed in the locality;

- Implementation of forest allocation policy under the current regulations of the State;

- Organizing doorman station in the vital areas of forest.

8.2 Natural forest harvesting.

** Potentials for harvesting timber from natural forest:*

3,125.7 m^3/year; The annual-average harvested area is: 150 hectares. Harvesting production is averaged over 1 ha with area of 3,125.7 (m3/ year) /5,238.43 (ha) = 0.60 (m3/ ha/ year). Equivalent to biomass reserves is 1.0 m3/ ha/ year which is much lower than the average growth rate of harvested forest: 174m3/ ha * 1.5%/ year = 2.61 m3/ ha/ year.

* Species which be banned or limited to harvest:

Harvesting process shall be complied with the provisions of regulations on logging and forest products. Prohibitng to havest the endangered species, high conservation value species ... the species are listed in the Vietnam Red Book. Paying attention to leave the tree as seed trees, protected trees, zoning restrictions for timber production must be applied measures to limit the impact.

* Harvesting plan per year or per rotation

Basis to develop annual havested plan, and for rotation is to ensure sustainable, stable forest productivity, based on the following factors:

- Structural forest resources in area and volume;

- The situation of growth, forest cleaning, abundance of forest resources;

- Requirement about forest the business and take advantage of the wood;

On the basis of these identified criteria and the results of the actual survey in the locality; The plan has identified the area, volumn, the sequence of compartment into harvesting to ensure stability in the business cycle of 35 years with harvested area of

5238.43 hectares. The accessiable level is 0.75, so the actual harvested area is 3928.82 hectares, with production of 109 398 m3, the average annual harvested is 3.125 m3, lower than calculated above.

8.3. Forest regreration.

** Objective.*

- Excluding the trees with bad qualities, enabling for the remaining trees in favorable growing.

- Formation of forest structure which have enough generations: The Independent, adjacent, reserves, regeneration while utilizing forest products and forest sanitation improvements.

** Tree marker and adjusting forest structure:*

- Choose trees for nursering: A healthy plant, good qualities, belong to plants with every generation purposes.

- Choose the supporting trees: The species of low economic value, but healthy and effective support the targeted trees.

- Thinning/ cutting trees: Trees with bad qualities, crooked, diseased, tightening obstruction, necrosis, plant trees pinched purpose complex.

- Adjust the forest structure: The minimum diameter (D 1,3) of trees to regulate forest structure with matured generation should be carefully analyzed in the design process;

The forest structure after nursering time have to ensure reasonable proportion between the classes: Reserve (D = 8-35 cm) - Adjacent (D = 36-45 cm) - The Independent (D> 45 cm).

Oriented forest structure (distribution of trees as diameter-generation) after nurtured for large timber forests for achieved as the following:

Unit: Tree

Potential regeneration	Reserve generation	Next Generation	Mature generation	In which, the seeding tree	Total
600	220-250	80-100	25-30	25-30	325-380

** Regenaration plan per year and per rotation.*

The basis for planning the annual forest maintenance and for 1 cycle is to ensure sustainable, stable forest productivity, based on the following factors:

- Forest after selected harvesting with insufficient canopy structure generations;

- The trees of poor quality (quality c) accounting for high rate in forest stands;

- The situation of unequal growth between the generations;

- Requirement of the business and take advantage of the wood;

On the basis of these identified criteria, the results of the actual survey in the local area; the area is identified in the plan; the sequence of compartment into forest nursering to ensure forest resources are stable development in the business cycle of 35 years into. The area of maintaining is 5287.74 hectares, the average annual need nurturing conducted 151 ha.

8.4. Natural forest improvement

** Objective:* Converting degraded forest which are no longer effective to improve. The aim is to improve the function of forests by afforestation with long business cycles on the whole forest plot

** Application conditions and improvement methods:*

Based on the conditions applied in circular No. 23/2013/TT-BNN issued on May 4, 2013; application conditions to improve forest in the plan are:

- Impoverished-evergreen broadleaf natural forests, impoverished mixed forest timber-bamboo, which are planned for production forests under Decision No. 2380 /QD-UBND issued on June 23, 2015 of the People's Committee of Ha Tinh Province on adjusting 3 types of forest on forest hills area;

- There is forest improvemen plan which are stated detail in the plan and be approved by authority agencies;

- Natural forests into rehabilitation must be met the following criteria:

+ The plot can no longer be recovered into the forest status of high quality; The annual growth rate of<2m3/ha/year; composing to purpose tree species lower than 50% are distributed unevenly (locally, according to the group);

+ Forest canopy structure is broken; Coverage of tree has diameter of 1.3 m under ground from 8cm, smaller than 0.3 on the forest plot;

+ Site conditions is suitable with characteristics of plant species growth and development, which is choosen into rehabilitation; slope of forest plot<25^0; Improvement area <100ha/1 compartment/1 times improvement;

For evergreen broadleaf forests, improved objects are: Number of regenerated trees with height from 1m is <800 trees/ha, unevenly distributed over the plot area; Timber rervers of all trees with a diameter of 1.3 m is <$50m^3$/ha; For improved objects in the plan is <40m3/ha;

For mixed timber-bamboo fores: Improved subjects has timber reserves of all trees with a diameter of 1.3m, above on the ground from 8cm is <$25m^3$/ha, distributed unevenly on the forest plot; Number of bamboo trees with a diameter of 1.3 m above the ground from 5cm are <1500 trees/ha in a forest plot.

** Technical measure:*

Clear cutting for the total area of evergreen broadleaf forest and impoverished mixed timber-bamboo forest; clear vegetation, identifying soil type to determine the best alternative species; Applying technical meaure on afforestation for each species according to the afforestation process 04TCN 128-2006, issued with Decision No.4108QD/BNN-KHCN, dated 29/12/2006.

** Forest improvement plan per year and per rotation.*

The basis for developing annual forest improvement plan and for a roation is to ensure plantation have better quality, greater protection capacity and more efficiently business without affecting to the forest protection, environmental protection and biodiversity conservation:

- Forests are be improved, have to be met all the applicable conditions in section 4.2 of this section (forest regeneration);

- The selection of tree must be based on ecological characteristics of each species, natural conditions, socio-economic, sub-regional regional climate at the area;

- Meet requirements on plantations business;

On the basis of these identified criteria, and the results of the actual survey in the locality; the area is identified in the plan, orderring of compartments into practice of improvement, in order to improve protection and business efficiency is 905.38 ha. This area will be improved in the period from 2016 to 2027 of the plan, the average annual

improvement should proceed 75.45 ha; Forest tree species for improvement are defined as the indigenous species such as Cong, Lim xanh, Dổi, Re and some exotic species like Acacia, Cinnamon, Magnolia conifera ...

8.5. Afforestation

** Objective.*

- Improving vegetation coverage, enhancing protection capacity, improving soil and this is a reasonable solution towards the goal of sustainable land use.

- Improving the quantity and quality of forest products while strengthening the natural potential to improve the forest productivity.

** Applied objects:*

- Bare land, grass land; bare land with scrub.

- Plantations reached the age of harvesting

- Soil after improvement of poor natural forests following current regulations.

Non-forest land or not becoming forest yet, the only grass, bushes or bamboo with canopy cover is <0.1. Depending on the current status of vegetation and ecological characteristics to divide into the following categories:

+ Status- Subject1: This style is characterized by a vegetation layer of grass, reed or wild banana.

+ Status- Subject2: This style is characterized by shrub vegetation layer, may also have some wood tree, scattered bamboo.

Plantations reached the harvested age or low quality.

+ Acacia forest at the haveseted age.

+ Manglietia conifera forest- low quality.

- Planned land for forest planting in the plan belongs to production protection (for protection, planting protective forests, for production, planting production forest).

** Afforestation per year and per rotation.*

The basis for implementing the annual planting and for 1 cycle is current bare land of the Company through the results of survey on forest status for develoing this sustainable forest management plan;

- Bare land have to fulfill the applicable conditions are presented in the sustainable forest management plan;

- The selection of forest trees must be based on ecological characteristics of each species, natural conditions, socio-economic sub-regional climate of the area;

- To meet the requirements of the technical measures and plantation business;

On the basis of these identified criteria, and the results of the actual survey in the locality; the area is identified, orderring the compartments to afforestation to improve the protection capacity and business efficiency, which is 338.95 hectares. The area of intensive cultivation for whole cycle is 2111.07 ha, the average annual is 60,31 ha; Forest tree species for improvement is defined as the indigenous species such as Cồng, Lim xanh, Dổi, Re and some exotic species like Acacia, Cinnamon, Manglietia conifera...

8.6. Timber logging from semi-natural forest.

** Objective.*

- To meet the demand for raw materials for production and trading, processing and consumption of plantation timber products.

- Reforestation aims to intensive forest to get high yield.

** Forest objects for harvesting.*

- Plantation will be only harvested in area which is planed for production;

- Mature plantations regardinng to technology and economics will be harvested (depending on the species, the mature age in technology and growth peak will be different).

** Harvesting methods:*

- A comprehensive clear havesting: Apply for pure Acacia forests, Manglietia conifera, and Cong trang.

- Clear harvesting following in bands: Application to mixed-species plantations and other native species.

** Havesting plan for semi-natural forest per year and per rotation.*

The basis for developing annually logging plan and for 1 cycle is to ensure sustainable, stable forest productivity, based on the following factors:

- The area of plantation in mature age in technology and economics;

- Requirement of the business and take advantage of the wood;

On the basis of the plan for the whole rotation, which is raised in section 6, at mature age in technology and economics of each specice, plantation status quo before developing the plan. The plan has identified since 2018 with the plantation at the harvesting age. But in order to have annual stability and sustainability, the production area and forest yield will be stable harvested annually from 2028. Area, production, order harvesting of compartments for sustainable and stable business in the 35-years cycle is: 1789.1 ha area, volume: 125,181 m^3 average harvesting/ per is 4814.8 m^3.

8.7. NTFP harvesting.

** Objective.*

- To meet the demand for materials in place and to support **communities living near forests.**

- Sustainable management of non-timber resources in their assigned forest management company.

** Forest objects for harvesting.*

- Natural forests are planned for productive forests with NTFP species allowed to harvest;

** Harvesting methods:*

- Harvesting products from bamboo:

+ Harvesting bamboo shoot: Harvesting 50% of bamboo shoots/dust/ harvesting time; seasonal harvested from March to August every year;

+ Extraction material from bamboo: Maximum harvested reserves shall not exceed 70% of the bamboo trees/dust/a harvested time; Seasonal harvested from August last year to March next year, 2-year harvested cycle.

Rattan harvesting: only harvesting trees aged 5-7, Looking at the bush tree, trees with leaves surrounding the tree's body is green, leave's face has thorn. When the leave become old and fall down, the tree can be exploited. Body is longer than 9m (including tree top). The bush tree has under 6 trees, which are not allowed to harvest; Number of harvested trees/rotation will be depended on the level of growth and ecological conditions of each region. The harvested trees with enough length account for 1/5 to 2/3 of the trees in bush for production forests which are natural forests. Harvesting seasonal of rattan is from January-April and September-December; because natural conditions at the Company from May to September will be effected by Southwest wind (Laos wind) with dry heat, easy to forest fires.

- Harvesting Cay mau cho: These are plants with long vines body, big, brown bark, red resin as blood. According to the experience of local people, the trees can be regenerated very good "only after 1 harvesting year, the tree root could be growth and development normally". Hence, during harvesting, the plant operators should be leaved with a height of 20-50 cm above the ground for naturally regeneration. Harvested seasonal is from April to December in the year.

- Harvesting other forest products: Before harvesting, it is needed to understand the ecological characteristics of each species to have specific harvested plan for each type.

** NTFP harvested plan per year and per rotation.*

The basis for developing annually NTFP harvesting plan and for one cycle is to ensure sustainable, stable forest productivity, based on the following factors:

- The survey of NTFP species which are expected to harvest in 2015;

- The demand for non-timber products and bussiness capability of each each non-timber forest products;

Sustanable harvested NTFP plan is defined as:

- Bamboo harvesting: the harvested area of bammboo is 2237 ha, the average harvesting is 447 ha/year; expected yeild is 19078 tons, on average 545 tons/year.

- Rattan harvesting, Cay mau cho and other NTFP species: the harvested area is 8087 ha, the average is 1617 ha/year; yield: Rattan 1.750 tons, on average 50 tonnes/year; Cay mau cho: 5003500 ton, on average of 100 tons/year; Other forestry species: 700 tons, on average of 20 tons/year.

8.8. Agro-forestry production.

** Objective.*

- Diversification of production and business sectors of the company;

- Create jobs, increase incomes for labor (including labor of Company and local area);

- Create a budget to support for the forest protection and development;

- Building a pilot model to help the communities living near forests to study and follow, thereby contributing to reducing the pressure on natural forests;

- Take advantage of a bare land which can not likely reforested and other objects which is not planned for forestry purposes.

** Objects.*

- Land planning for agroforestry production belong to bared land, the land along streams, other land which not planned for forestry purposes.

** Identify the productive methods.*

- Construction farms for sow, pigs;

- Planting fooder grass and developing farm of cow

- Planting oranges

- Planting of industry plants, herbal plants.

** Agro-foresty productive plan per year and per rotation.*

The basis for annually agroforestry production plan and for 1 cycle based on the following factors:

- The results of the survey land status quo of forest resources on 2015;

- The survey on the situation of redundant workers, seasonal workers, idle workers on the communes belong to area No. 4 of Huong Son district;

- Findings on the research for market for all kinds of products in the recent years and the trend of the next year;

Agroforestry production plan are identified as:

- Construction farm of sow, pigs, cows with a scale of 40 ha, started since 2016, put, into stable production in 2017, estimated production of 1,000 tons/year.

- Planting fooder grass for raising cows: planning area of 14.6 ha; estimated production of 146 tonnes/year.

- Developing orange farm: planned area of 15 ha; estimated production of 75 tonnes/year.

- Developing the area for industrial crops, herbal tea: Area: 108.1 ha; estimated production (after going into stable production) 4,322 tons/year.

- Producting of other agricultural products: 16.4 ha area, estimated production is 163.8 tons/year.

8.9. Wood processing and sale

** Objective.*

Utilizing the volume of standing trees, save the forest resources. Facilitating business production for the Company, increasing revenue and profit operation, to create investment conditions back to forests, increasing accumulation submitting to the State budget;

** Objects.*

Round wood is harvested from natural forests and plantations, have been developing harvested plan as;

** Product processing, sale and equipment:* There are 2 types of saw good and plywood; Equipments are used for sawing round wood are Cua vong, Cua dia and other machines such as drills, planers, grinders, polishers ...

** Proccessing and product saling plan.*

Pursuant to the harvested plan of natural forest and the plantation, the plan for forest nursering plan, forest improvement plan are stated on above section of SFMP. Plan for processing and consumption of wood products is identified as:

- In the period from 2016 – 2027, it is only processed and consumpt of natural forest timber, utilizing harvesting during nursering period, forest regeneration;

Estimated volume of wood for processing and consumption is 53131 m^3, the average is 4427 m^3 of log/year, relevent to 2656 m^3 of sawn timber.

- In the period 2028 – 2050, processing and consumption of wood products both from natural forests and plantation; Estimated volume of wood for processing and comsuption is 217263 m^3, respectively to 130358 m^3 of sawn wood and artificial boards; the average annual for processing and consumption is 9446 m^3, respectively to 5667 m^3 of sawn timber and artificial boards.

8.10. Infrastructure development plan

** Developing new transportation roads and local roads.*

It is expected in rotation of implemting SFMP 14 kilometers of road transport and local roads will be developed in the period from 2016 to 2030 with a total budget of 15840 million dong.

** Maintenance transportation roads and local roads.*

The total maintenance length of roads is 100 km with a total cost of 7,000 million dong.

** Developing factory.*

Planning to build factories for processing artificial board with a total investment cost of 8.000 million dong

** Developing and maintaining forest protection stations.*

Planning to build a new 3 guard stations with a total investment cost of 500 million dong; Maintenance fee for guard stations is 2,070 million dong;

** Developing the farm area.*

Developing infrastructure to ensure better production and business in an area of 303 hectares of planning for agroforestry production, with a total cost estimated at 22 924 million dong.

** Maitaining the processing factory and the farm.*

Estimated investment costs for maintenance factories and farms is 3,330 million dong.

(Details in table 18 – Infracstruture development plan)

8.11. Forest environment service provision plan.

It is currently supported and funded by the SNV Vietnam to complete the initial assessment of the forest environmental services. However, the forest environmental services is only potential in technically, but in terms of mechanisms and policies and laws, the state has not been elevated to the goods for business purposes. In the coming time, when policy mechanism is completed, the company plans to provide a specific number of forest environmental services as follows:

- Services for biodiversity conservation;

- Services for Soil Conservation;

- Services for water conservation;

- Services for greenhouse gas emissions;

- Services for vulnerable habitats;

- Services for the genetic conservation of endangered species, rare;

- Eco-tourism services.

8.12. Community forestry

Operation areas of the company is located in the administrative boundaries of the three communes and 1 town, but most of villages are located far from the company area. There are only 2 villages of Son Kim 1 commune and 1 village of Hong Son commune located near the company area. Hence, for sustainable forest management to ensure 3 goals: economic, social and environment, the Company pays special attention to developing the plan supporting for community forestry in this village's area, especially focusing mainly for two villages in Son Kim 1 commune and 1 village on Hong Son Commune. In addition, the company also cooperate with the authorities of communes, towns and two border station located in the area. Pursuant to the production and business plans, the community forestry plan have been developed is determined as follows:

** Supporting, copperatiing with other partners to implement duties*.

- Allocating outside protection for groups and community:

+ Hong Son CPC;

+ Community of village No.11, Son Hong commune;

+ Hong Son border stations;

+ Son Tay CPC;

+ Son Kim CPC;

+ Community of Khe 5 village, in Son Kim 1 commune;

+ Community of Khe Dau village in Son Kim 1 commune;

+ Son Kim border stations.

- Allocating for forest rehabilitation, afforestation, tending plantation and developing the projects of agroforestry for communities:

+ Community of village 11, Son Hong commune;

+ Community of Ke Nam village, Son Kim 1 commune;

+ Community of Khe Dau village, Son Kim 1 commune.

** Supporting communities:*

Supporting and creating good conditions for communities: village 11, Hong Son commune; Khe Nam village, Kim Son commune; Khe Dau village, Kim Son commune; and some individual households residing in the area Commune belong to No. 4 area of Huong Son district to utilize some type of NTFPs such as: bamboo, rattan, hèo, day mau cho and some other forest products. However, the harvesting of non-timber forest products is striclty be complied with the need the plan and harvesting guideline of the company.

8.13. Monitoring and assessement forest resources of the Company.

- Documenting the forest management records according to Circular No. 25/2009/TT-BNN&PTNT, issued on May 5, 2009 of MARD guiding on forest statistics, inventory and profiling forest management record.

- Updating the forest annual changes, implementing forest inventory of area and reserves after 5 years.

- The system of forms prescribed in Circular No. 25/2009/TT-BNN.

8.14. Labor and investment attraction plan

** Abour labor*

Implemeting management tasks, production, business, harvesting, forest products processing, the silvicultural measures are calculated from the basic of the economic and technical norms and the actual needs of each task. Labor demand for production activities of the Company are expected to average about 350 workers long-term

employment. Currently staffs are 147 people, need to hire around 203 people; demand for seasonal workers in the province is 300 people.

** About production expenses and ability to create capital*

- Demand for capital costs for production include: Investment for silvicultural work and forest industry, which agroforestry production, capital cfor onstruction and other expenses include overhead expenses justice, tax, taxable income and costs incurred redundancy. Total demand and investment costs for the entire production and business cycle 2,993,499.824 million dong.

- The ability to generate capital including: capital to implement public tasks, from forest environmental services, forest products business capital, from processing and production of the proceeds from agroforestry. The ability to generate fund in the cycle is: 3,095,468.05 million.

9. Efficency of the SFMP.

9.1. Economic

** Identify the investment time.*

Based on the production and business plans defined and investment needs for each individual year, each stage, the plan identifies investment period starting from 2016 until synthetic production business profitable items.

According to calculations of capital demand at table 21 and the ability to generate capital at table 22, the investment period is determined to be from 2016 to 2025. In the 10 years if the investment is carried out for production business plans in accordance with the plan, the business will have started profitable from 2026 onwards and constantly increased in the following years. On 2026, profits is calculated as 2,640.205 million dong and will reach 8,336.903 million on 2050 (unit price of equipment, seed, seedling, wages, profits are calculated according to the current price at the time of the plan).

** Estimating the expense cost and pofits for rotation.*

- The production and business value for the cycle of 35 years is calculated as 3,095,468.0419 million dong.

- Expenses for production business for the whole cycle is: 2,993,499.823 million dong.

- Calculated profit for the cycle is 101,986.225 million dong, the average profit 2913.377 million dong/year.

9.2. Social efficiency

- Annually create enough jobs, guaranteed income for the 350 employees of the Company (the existing employees: 147 people, need to recruit 203 persons), 300 seasonal contracts workers;

- Through allocation of forest and forest land and other solutions to solve the conflict about benefit sharing from the forest, through which the forest management and forest protection will be more sustainable;

- Activities of the company is stable, the life of officials and employees, surrounding households have more jobs, their life is increased. Contribute to the economic stability of the region.

9.3. Environmental impact assessment/ projection

Most effective and most meaningful is to protect existing forests, raising forest coverage from 93.9% to 97-98% when forming. Regulating the flow of the Ngan Pho River, contribute to reducing the dangers of natural disasters, limited surface erosion. Ecological environment protection and biodiversity conservation in the region. Stabilize annual landings, ensuring raw material being processed

10. Organization for implementing.

10.1. Division of responsibility.

Based on the objectives, tasks and orientations stated in the plan, the company will assign responsibility for the provision of personal and specific tasks, in order to better implement the construction plan. Inside:

- Director Company: Operating activities planned in the plan approved by the State, to ensure economic efficiency, environmental stability and ensure benefits to the community and society.

- Forestry Department: Coordinate with Business plans to build the economic level - technique to apply to the production stage; Preparation of design work exploitation and silvicultural items for production plans of the Company; Applying the scientific work of the latest technology, the most suitable for production of the Company's

business; planning, directing investigations unit construction designing monitoring and evaluation of forests and forest development.;

- Personnel and Administrative Division: Attractive, employers, human resource training and civil service of the production and management of the Company; Regulations and check out the work of occupational safety ...

- Finance and Economics Department: Focus on the work of credit financing, guaranteed funding for production planning; Financial settlement under the regime of the state, analyzing the efficiency of production and business of the Company;

- Forest protection management sections: Focus for the management of forest protection; Forestry coordinated prevention, investigation unit for monitoring changes in forest resources; participate in the formulation of forests, agroforestry production.

Organizing the implementation plan for sustainable forest management must comply with current regulations of the law and the provisions of Option.

In details:

To adhere to and implement the standards and criteria of FSCTM.

Forest management activities must respect the laws of the country and expressed phuongphai address long-term commitment by the standards and criteria of FSCTM.

To promote the rights and responsibilities of land use.

There are adequate mechanisms for the benefits to the community.

Forest management must achieve economic sustainability, while still fully interested in environmental issues, social, production costs and maintain the necessary investment for the ecological productivity of the forest .

Forest management plans should include measures to minimize environmental impact. Implementing the guidelines to identify and protect rare animal species at risk of being threatened.

Management system to promote the development and adoption of pest management systems, chemical use environmentally friendly and avoid using chemicals IA, IB, the type contained in the category of carbon hydrates world health organization (WHO) ...

The management plan must be revised periodically, have to coordinate with the results of monitoring and evaluation or scientific information and new technologies, as well as adapt to changes in economic, environmental and social.

FOREST MANAGEMENT PLAN SHALL INCLUDE AND IMPLEMENT SPECIFIC MEASURES TO MAINTAIN AND ENHANCE THE CONSERVATION ATTRIBUTES CAN BE APPLIED DUOCPHU WITH THE PRECAUTIONARY APPROACH. THESE MEASURES MUST BE SPECIFIED IN THE PUBLIC SUMMARY OF THE PLAN AND MANAGEMENT.

DESIGN AND LAYOUT OF PLANTATIONS SHOULD BE DESIGNED TO PROMOTE THE PROTECTION, RESTORATION AND CONSERVATION OF NATURAL FORESTS, AND NOT INCREASE PRESSURES ON NATURAL FORESTS.

10.2. Checking, monitoring and evaluation.

Monitoring and evaluation (M & E) progress made in the planned activities for sustainable forest management (SFM) is firmly secured conditions effective sustainable forest management (SFM) of the Company.

10.2.1. Objective

Monitoring and evaluation of progress made in the planning of sustainable forest management activities of the company is to ensure that the activities are carried out according to plan was established and enforced. Typically, the activities are carried out slowlier than planned, even with some activities is not implemented due to lack of resources. Therefore, monitoring also aims to discover the difficulties and problems in the implementation, and since then promptly adjust plan to achieve sustainable forest management more feasible adjustment measures or implement existing plan has achieved the highest results compared to the plan made .

10.2.2. M & E indicators

M & E indicators must be quantifiable and measurable, countable and must include economic aspects, social and environmental. Business forest cycle is defined as 35 years, but the indicators for M & E will be determined for each 5-years period, because after every five years, the plan may have to be adjusted to suit the curent context. In every 5-years period, the indicators are subdivided per year and even per half of the year.

Target tracking can be an area, forest volume for harvest; The area of forest maintenance, reforestation, enrichment and protection of forests, protection of ecosystems; Length of road transport and extraction; Reserves of rattan, bamboo; The volume of wood supply for the local population; Income in cash to the Company and the locals; Jobs for local people; ...

10.2.3. Organization to implement

For the work performed by the Company, advising departmental leadership, responsible for tracking and monitoring the progress of implementation of the activities have been implemented in practice compared to the plans is already established . Upon detection of these difficulties should immediately report the board and find reasons to overcome;

For the work of the company, but in conjunction with the local community made, the test group must have the combination between the Company and the local population. Component test group, rated to compact, but fully capable to do the job, especially when examining the work done by local people. Monitoring Group could include representatives of districts, the Company, Chairman or Vice Chairman of the commune, village leaders, forestry ranges and police;

Check the progress of the plan is done on a quarterly basis . The first was conducted in the first week of April every year, to assess the results of implementation of the plan in the first 3 months. The second time is done in the first week of July, to check and evaluate the results of implementing the plan per six months. The third time was conducted in October to assess the results of implementing the plan of Q3 and the fourth was assessed in January of next year to evaluate the results of implementing the plan of the previous year.

Depending on the operating company will decide the appropriate evaluation period; Results of monitoring and evaluation is also used as a basis to adjust the SFM plan for the next year.

10.3. Conclusion, recommendation.

10.3.1. Conclusion.

The sustainable forest management plan of Huong Son State Forest Company has been developed based on basic inventory and thematic survey of social impact,

animal and plant diversity, forest resources. Map of forest status is based on the results of satellite image SPOT 5 shooting in 2008 by experts of Forest Inventory and Planning Institute. Surveys of forest reserves has been conducted, the mapping and zoning functions have been developed. The results of the evaluation are the leading experts in the implementation, ensure data fidelity and high reliability, enabling use to analyze building SFM plan.

Plan has been developed with reference to the criteria and indicators of International and national standards for sustainable forest management FSC™ . It also proposed a number of mechanisms and policies need to innovate to meet the requirements for sustainable forest management standard of FSC™.

The plan for sustainable forest management has been respective much participation of VNFOREST , forestry institutions in Vietnam, the local and international organizations (SNV , GFA , WWF), the local authorities, agencies you have experience in developing and implementing plans for sustainable forest management , households and rural communities and professional staffs in forestry sector , the armed forces play a role in the province built and implement the plan ...

10.3.2. Recommendation.

In order to implement sustainable forest management successfully, the Company would like to propose the following:

Department of Agriculture and Rural Development approves the SFM plan and allows the Company to implement plan for sustainable forest management in order to draw lessons for replication in other areas in the province.

Government provide the incentive credit, low-interest loans for a long time in line with the forestry production cycle.

Government revises some forestry policy towards strengthening right and proactive powers to forest owners and at the same time give right to have benefit from some forest services such as water, ecological environment...

Providing a part of local government budget from the tax of natural resources back to the Company to support expenses such as management and protection of protection forests, improvement of degraded forests, protection of the ecosystem ...

With that, the company can have suficient condition for implementatiing of sustainable forest management following the standards FSC^{TM}.

PPC and district committee support the establishment of group cooperating with the company the forest management plan and control of external .

When the plan is completed and the forest get FSC FM certified, propose the Ministry of Agriculture and Rural Development, PPC ... continue to support the company in the implementation process, such as : Support in designing Reduced-impact Harvesting, support to maintain the results of the SFM process, support for marketing forest products to abroad, post- project evaluation.

In order to implement the business plan to manage natural forest management, plantation in a sustainable way and suitable with the current context, the development of SFM plan is needed. Company respectfully requests that the Department of Agriculture and Rural Development to approve and support the implementation of this plan. / .

To:

- *DARD;*

- *Achieves Ad, SFC.*

Vice Director

Pham Nguyen Binh