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# REPORT

## STUDY ON DEVELOPMENT OF POTENTIAL PAYMENT FOR ENVIRONMENTAL SERVICES IN YEN BAI

**YEN BAI 12/2020**

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## TABLE OF CONTENTS

FOREWORD.....	5
MAIN CONTENT.....	7
I. BACKGROUND FOR PROPOSAL ON DEVELOPMENT OF FES.....	7
1. Scientific basis.....	7
2. Legal basis.....	10
3. Practical basis.....	13
4. Overview on natural and socio-economic conditions of yen Bai province.....	17
II. OVERVIEW OF THE PFES POLICY IMPLEMENTATION IN YEN BAI, THE PERIOD OF 2016-2020.....	21
1. Types of forest environmental services.....	21
2. The revenue from forest environmental services in the period of 2016-2019 (see the Annex 03).....	22
3. The user of forest environmental services.....	22
4. The providers of forest environmental services.....	23
5. Payment for forest environment services (see Annex 04).....	23
6. The rate of forest environmental service charge.....	24
7. The forest area of PFES.....	25
8. Form and method of payment for FES.....	25
9. Mechanism of PFES distribution of VNFF.....	27
10. Overall evaluation.....	30
III. PROPOSED SCENARIOS AND ROADMAP TO IMPLEMENT PFES IN YEN BAI, THE PERIOD OF 2021-2025.....	31
1. Orientation and targets.....	31
2. Proposal of expanding FES and FES payers in accordance with the Decree No.156 of the Government.....	32
2.1. Proposed scenarios and roadmaps to implement payment for the forest carbon absorption and storage service (service iii).....	32
2.2. Development of the expanded scenario for implementing the payment for services of i, ii, iv, v.....	38
2.3. Development of PFES payment scheme for FES services i, ii, iv and v.....	42
2.4. Total of potential PFES revenues between 2021 and 2025 and impacts of such revenues ...	46
CONCLUSION AND RECOMMENDATION.....	49

## LIST OF TABLES

Table 1: Summary of current legal documents relevant to PFES .....	11
Table 2. PFES charges distributed to providers in period 2011-2020.....	15
Table 3: Summary on the PFES implementation results in Yen Bai, the period of 2016-2020 .....	26
Table 4: The quantity and the paid amount of the FES providers.....	29
Table 5. The list of emission sources with great flow .....	32
Table 6: Summary of potential PFES revenue and its distribution .....	46

## LIST OF FIGURES

Figure 1: PFES progress from 2011 to 2020.....	14
Figure 2 : PFES charges proportion from 2011-2020.....	15
Figure 3: Distribution proportion of PFES paid to providers .....	17
Figure 4: Proportion of the revenue from FES in Yen Bai, the period of 2016-2019.....	22
Figure 5. The number of entities paying FES charges ( 10/2020) .....	23
Figure 6: Proportion of PFES for the FES providers in 2019 .....	24
Figure 7: Proportion of the forest area for PFES in 2019 .....	25
Figure 8: Expected additional PFES amount collected from hydropower plants compared with the year 2020 (billion VND).....	42
Figure 9. : Expected additional PFES amount collected from industrial facilities compared with the year 2020 (million VND).....	43
Figure 10: Expected additional PFES amount from aquaculture facilities compared to 2020 (million VND).....	45

# FOREWORD

## 1. Background

On April 10, 2008, the Prime Minister issued Decision 380/QĐ-TTg on PFES pilot implementation in Son La and Lam Dong provinces. After successfully piloting PFES in Son La and Lam Dong provinces, on September 24, 2010, the Government issued Decree 99/2010/ND-CP mandated the implementation of PFES nationwide from 1 January 2011. After 10 years of implementation, the PFES scheme has generated a sustainable financial source for FPD, linking forest environmental service providers and users; improving the livelihoods of households, individuals and communities engaged in forest development; contributing to FPD, biodiversity conservation and socio-economic development in rural mountainous areas.

PFES policy is one of the new policies in the forestry sector in Vietnam. This is a new step, demonstrating a strategic breakthrough, switching the approach from entire dependence on the state budget to increase of mobilization from social capital for FPD. It was the first time when a new forestry economic policy was introduced and regulated at a national scale, which were supported by all levels, sectors and local people; having a spillover effect, creating a close relationship between forest owners as being a role of service providers with organizations and individuals making benefit from forest environmental services.

- The Law on Forestry was promulgated by the National Assembly at the 4<sup>th</sup> meeting of the National Assembly session XIV on November 15, 2017 extending the types and beneficiaries of PFES. The law is a foundation for studies and proposals to finalize and extend the types and beneficiaries of PFES in accordance with the national socio-economic conditions, contributing to generating a new financial resource for direct investment into forest; supporting for the Vietnam's commitment in the implementation of the Paris Agreement on climate change.

Yen Bai is one of the provinces implementing the PFES policy since 2011 and has achieved specific results, contributing to additional funding for forest management, protection and development, biodiversity conservation; improving income for people engaging in forest development, especially ethnic minority households. However, up to now, 5 types of services and 6 forest environmental service payers as stipulated in the Law on Forestry have not been fully implemented due to many different reasons.

The brief assessment on opportunities and feasibilities to develop new payment options for forest environmental services in Lam Dong, Vietnam by Mr Fabien Monteils (06/2020) showed that PFES in Vietnam payment is made almost only by indirect methods; However, there is a tendency to take advantage of direct payments, increasing the sustainable financial resources for SUFMBs and PFMBs. The combination of direct and indirect PFES methods in Vietnam is a really crucial transition. Among the 5 types of environmental services described in the Law on Forestry, service 2 (clean water production and supply establishments), 4 (eco-tourism companies) and 5 (aquaculture service) should be given priority.

Therefore, it is necessary and on track to review and evaluate the potential PFES development under the current legal framework and in accordance with the conditions of Yen Bai province; as a premise to propose additional types of services and subjects have to pay for FES as well as mechanism on the additional revenue management and use in the coming time. This report was developed under the support of the project “Conservation and sustainable use of biodiversity and forest ecosystem services in Vietnam” (GIZ-Bio Project- Phase II) and Forest protection and development Fund of Yen Bai Province.

## **2. Objectives**

### a) Overall objective

Contribute to improving the financial sustainability for special-use and protection forests to ensure effective forest management and biodiversity conservation through extending PFES scheme by adding additional PFES in Yen Bai province.

### b) Specific objective:

- Propose to extend FES by adding additional types and service payer, clearly stating cases which direct payment is applicable.
- Develop an implementation mechanism for additional services, in which payment distribution plan is proposed.

## **3. Research methodology**

### a) Research, collect secondary data

- Collect, review documents, annual reports, 5-year summary report (2016-2020) on implementation of PFES scheme in Yen Bai province
- Collect, review legal documents on PFES scheme; on orientation and implementation of PFES scheme at central level and in Yen Bai province.
- Refer to research reports and documents on PFES payment in Vietnam, especially the draft report on 10 years of implementation of the PFES policy in period 2011-2020 and development orientation in period 2021-2030 by the FPDF.

### b) Research and collect primary data

- Discuss, consult with representatives of DARD; DoNRE, DoIT, People’s committee of districts, communes and city; Yen Bai industrial zone management board..
- Consult with FES providers in Yen Bai province: SUFMBs and PFMBs
- Survey and consult with FES users: hydropower production companies, industrial production facilities (using water from forests, large greenhouse gas emissions); aquaculture establishments; tourism companies.
- Circulate draft report to stakeholders for comments

### c) Organize technical meetings and seminars at provincial level

### d) Synthesize, analyze and write reports.

## MAIN CONTENT

### I. BACKGROUND FOR PROPOSAL ON DEVELOPMENT OF FES

#### 1. Scientific basis

##### 1.1. definitions of forest ecosystem services and forest environmental services

Many scholars (domestic and international) have introduced the definitions of forest ecosystem services, forest environmental services. Although these concepts are different, the main agreed points remain as following:

Forest ecosystem services is the benefit (directly or indirectly) provided to people from the forest ecosystem. Forest ecosystem services include:

- (i) Timber supply services;
- (ii) NTFPs supply services (firewood, food, medicinal herbs, etc.);
- (iii) Watershed protection services, water sources for hydropower, irrigation and domestic use. The volume and quality of water flows from the watershed forests play an important role in agriculture, hydropower, domestic water, habitat of aquatic species and other wildlife;
- (iv) Stabilizing and preventing soil erosion: forest plants help to stabilize soil and reduce erosion, wash out organic substances;
- (v) Services of forest carbon sequestration to reduce greenhouse effects to mitigate climate change. Forests have five carbon storage tanks (IPCC, 2006) to store and sequester CO<sub>2</sub>, which helps to reduce greenhouse gases in the atmosphere.
- (vi) Ecotourism, cultural and resort services.
- (vii) Biodiversity plays an important role in many aspects, including as a storage of genetic material and can be used to select and improve plant and animal species, and to manage harmful pests and diseases for the forest.

According to the above concept, services in category (i) and (ii) provide direct forest products (tangible products), while the remaining services are forest environmental services.

Therefore, *Forest environmental services is a part of the forest ecosystem services system, in which the forest environment services are forest products and services but not direct products such as wood, NTFPs.* However, not any forest provides all the above services and products, it depends on the forest natural and biological characteristics; exploitation abilities of benefits from forest; national and local policies. Analysis of FES needs to clarify what types of services, who benefit from services (buyers) and who are the service providers (sellers) and the need to develop a scheme to collect money from the buyers and pay to service providers.

The Law on Forestry (Clause 23 Article 2) apparently states, "*forest environment services*" are activities that provide value for the use of the forest environment".

##### 1.2. Concept on forest total economic value

In the past, the concept of total economic value (TEV) was very limited. Economists tend to only consider the forest value through tangible products that forests have created to serve needs of production and people's life. However, these tangible products only account for a small amount of the total forest value. In fact, forests have generated economic more benefits than the value of tangible products officially being sold in the market.

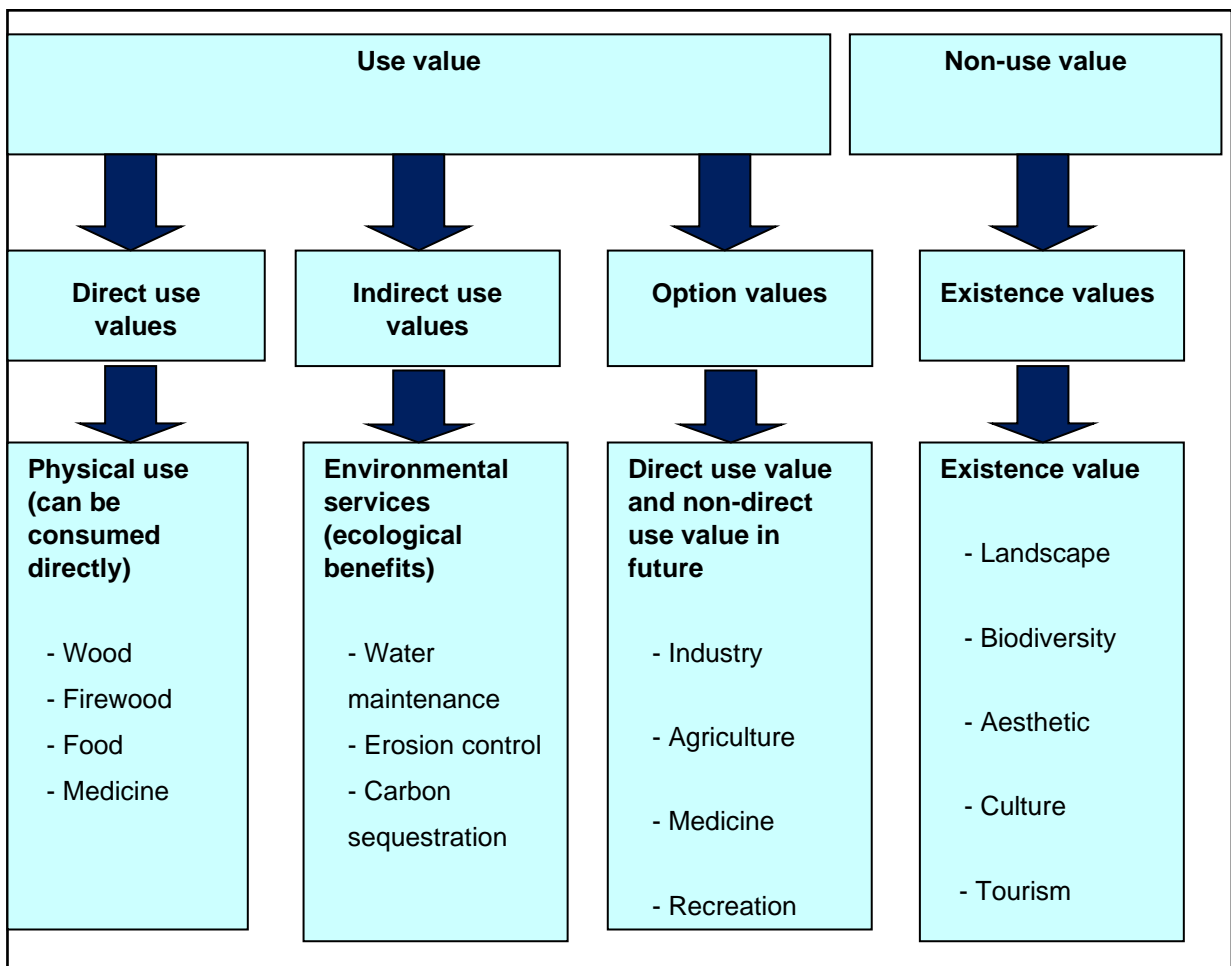
In recent decades, the definition of forest TEV has changed. The forest TEV includes: direct use value, indirect use value, option value, existence value and is shown in Figure<sup>1</sup>.

- Direct use value: is the value of raw materials and physical products obtained through when used directly in human production, consumption and trade such as wood, firewood, and NTFPs, medicinal plants, tourism, entertainment.
- Indirect use value: is the economic value of FES and ecological services obtained from forests such as water maintenance, flow retention, flooding regulation, erosion control, watershed protection, carbon sequestration and storage, forest landscape.
- Option value: is the unknown value of genetic resources, wildlife in the forest and forest ecological services being applied in future in field of recreation, pharmacy and agriculture.
- Existence value: is the value of direct or indirect use that the following generations have opportunities to use with cultural, aesthetic and biodiversity meanings.

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<sup>1</sup> Lucy Emerton: Economic evaluation to promote forest biodiversity preservation. Year 2005





**Figure 01: Total economic value of forest**

Source: [10]

### 1.3. FES valuation

FES valuation is to determine forest environmental values (indirect values) converted into money, to value and commercialize FES.

The concept of FES value is closely related to the value that forests provide to society and people. For a long time, FES were considered as public products, "gifts from nature" with "free of charge" and not valued in the market. Therefore, valuation of FES is to show the importance, value of forest ecosystems, benefits for production and social life; identifying the potential financial resources for forest management, protection and conservation; contributing the forestry outcomes into overall social products in a certain period; being an evidence of economic efficiency to compare with other products as well as consideration for to forests conversion into other farming types. Valuation methodology should be applied to indicate values of FES.

To sum up, total value of forest includes intrinsic value of the forest and the external values:

- Intrinsic value of a forest refers to the value which is generated from a forest area

The external value of a forest exceeds over the boundary and spatial dimension of the forest (such as water regulation and maintenance, soil protection, erosion prevention, carbon sequestration and retention...). In fact, FES providers have not yet enjoyed those benefits, while FES users have not yet paid for the used services.

## 1.4. Definition, principles and payment forms of PFES

### 1.4.1. Definition of PFES

PFES is an economic tool in which FES beneficiaries have to pay for those who contribute to forest ecosystem maintenance, protection and development. For instance, watershed forests are for water retention and quality maintenance, flood and landslide prevention for the downstream... Thus, downstream beneficiaries need to pay properly to people who directly involve in watershed forest protection. This is a new approach which has been applied in many countries around the world and considered as a sustainable financial mechanism for forest conservation, protection and development.

### 1.4.2. Basic principles

- Organizations and individuals that benefit from FES must pay to those who contribute to forest resources management in providing those environmental services; which means that anyone who benefits from the FES have to pay for those service benefits. This is the most basic principle. Users refer to FES buyers and providers refer to FES sellers.
- PFES made is based on voluntary agreement contracts between sellers (FES providers) and buyers (FES users); However, when these contracts have been finalized, there should be a binding mechanism between the two parties. The state involvement depends on the type of service.
- To ensure the effectiveness of PFES, payments must be made conditionally to the seller, meeting technical criteria in service provision.

### 1.4.3. Payment forms of FES

There are 2 payment forms of FES:

- Direct payment: FES users shall pay directly to FES providers.
- Indirect payment: FES users shall use entrusted payment method to pay to FES providers. In Vietnam, FPDF (at central and provincial level) is trusted for PFES.

## 2. Legal basis

- On April 10, 2008, the Prime Minister issued Decision 380/QD-TTg on pilot PFES implementation in Son La and Lam Dong provinces. After successfully piloting PFES, on September 24, 2010, the Government issued Decree 99/2010/ND-CP mandated the implementation of PFES nationwide from 1 January 2011.
- On November 15, 2017, the Law on Forestry was promulgated by the National Assembly at the 4<sup>th</sup> meeting of the National Assembly session XIV National Assembly, in which regulations on FES have stated from the Article 61 to Article 65 as following:
  - + 5 types of FES include: (i) Land protection, erosion and sedimentation limit of lakebeds, river beds and stream beds (ii) Regulating and maintaining water resources for production and social life;(iii) Absorbing and storing carbon of forests; reducing greenhouse gas emission by limiting forest loss and degradation; sustainable forest management and green growth;(iv) .

Protecting and maintaining natural landscape beauty, conserving biodiversity of forest ecosystems for trading in tourism services;(v) Providing spawning grounds, food sources, natural breeding stock, water resources from forests and environmental elements and forest ecosystems for aquaculture.

+ Rules for PFES: FES shall be paid when one of FES is provided; FES users shall pay relevant charges to their FES providers; Charges for FES shall be paid directly or indirectly; Charges for FES shall be added to costs of goods or services of PFES users.

+ 6 FES payees are: (i) Hydroelectric producers;(ii) Clean water supplies;(iii) Industrial producers;(iv) Entities trading in ecotourism, hospitality or entertainment services; (v) Producers or traders causing massive green gas emission; (vi) Producers of aquatic products.

+ Payment methods for FES include: direct payment and entrusted payment to FPDF (indirect payment).

+ Rights and obligations are prescribed for FES users and providers.

- Decree 156/2018/ND-CP dated 16/11/2018 of the Prime Minister on enforcement of a number of articles of the Law on Forestry include: regulations on payment rate, determination of forest area for service provision; management, use, exemption and reduction for FES charges; duties, organizational structures and mechanism for management and financial resource use of FPDF.

- Decree 40/2019/ND-CP dated 13/5/2019 of the Prime Minister on amendments to Decrees on guidelines for the Law on Environment Protection (Section III – amend and supplement the appendix of Decree 38/2015/ND-CP dated 24/2/2015 by the Government on management of waste and discarded materials) sets the list of massive industrial emission including coal thermal power, production of cement, steel production, which is subject to pay for carbon sequestration and storage.

- Decision 1775 / QD-TTg dated November 21, 2012 of the Prime Minister on approval of project of greenhouse gas emission management; management of carbon credit business activities to the world market assigns MARD to assume the prime responsibility and coordinate with the relevant ministries and sectors to study and develop and promulgate documents guiding the localities, agencies, organizations and enterprises associated to carry on business of carbon credits obtained from forest on the market outside the Kyoto Protocol (Clause 12 Appendix of the Decision).

- The Law on Tourism stipulates that “eco-tourism” means a form of tourism that is based on nature, connected with the local cultural identity and participated by local communities in combination with environmental education.

Regarding the international legal framework, in 2020 the Paris Agreement on Climate Change (adopted in 2015) replaced the Kyoto Protocol encourages countries to emission reduction credits trading (carbon credits).

**Table 1: Summary of current legal documents relevant to PFES**

No	Legal document	Content
1	Law on Forestry 2017 (valid from 01/01/2019)	From Article 61 to 65, the Law prescribes: 5 types of FES; payment rules; payment forms including direct payment or entrusted payment through FPDF (indirect); rights and obligations of FES users and providers.
2	Decree 156/2018/ND-CP dated 16/11/2018 of the Prime Minister on enforcement of a number of articles of the Law on Forestry	Regulations on rate, determination of forest area for service provision; management, use of FES charges; duties, organizational structures and mechanism for management and financial resource use of FPDF.
3	Decree 35/2019/ND-CP dated 25/4/2019 of the Prime Minister on penalties for administrative violations against regulations on forestry	Article 4: Penalties and remedial measures Article 9: Violations against regulations on payments for forest environments services
4	Decree 40/2019/ND-CP dated 13/5/2019 of the Prime Minister on amendments to Decrees on guidelines for the Law on Environment Protection	Section III – amend and supplement the appendix of Decree 38/2015/ND-CP dated 24/2/2015 by the Government on management of waste and discarded materials) sets the list of massive industrial emission including coal thermal power, production of cement, steel production, which is subject to pay for carbon sequestration and storage
5	Decision 1775 / QD-TTg dated November 21, 2012 of the Prime Minister on approval of project of greenhouse gas emission management; management of carbon credit business activities to the world market	assigns MARD to assume the prime responsibility and coordinate with the relevant ministries and sectors to study and develop and promulgate documents guiding the localities, agencies, organizations and enterprises associated to carry on business of carbon credits obtained from forest on the market outside the Kyoto Protocol. (Clause 12 Appendix of the Decision)
6	Law on tourism 2017	stipulates that “eco-tourism” means a form of tourism that is based on nature, connected with the local cultural identity

		and participated by local communities in combination with environmental education.
7	Paris Agreement on Climate Change	encourages countries to carbon credits trading

### 3. Practical basis

#### a) International

Developed countries in Latin America have been applied PFES the earliest. In Europe, some countries have invested in and implemented PFES programs and models. PFES has been developed and piloted in Asian countries such as Indonesia, the Philippines, China, India, and Nepal. Up to now, hundreds of initiatives on PFES have been introduced globally.

- Regarding the potential markets of watershed protection services: many case studies on PFES for watershed management have been conducted in Indonesia and the Philippines. Costa Rica, Mexico and China have developed big-scale PFES programs directly paying for landowners to apply measures enhancing water resource regulation and maintenance and preventing erosion. Watershed protection services have been piloted in most countries to generate sustainable financial resources and share benefits with communities in forest protection and development.

- Regarding the potential markets of carbon sequestration services: recently, many countries have paid attention to carbon sequestration under the United Nations framework convention on climate change. Since 1998, Australia has legalized carbon emission right allowing investors to register ownership of forest carbon sequestration. Some countries have applied CO2 emission pricing. CO2 emission pricing is a scheme in which companies shall pay charges equivalent to the amount of CO2 emission from their business. By 2018, fifty-five initiatives on CO2 emission pricing have been already implemented or going to be in forty-six countries. These initiatives are expected to counterweigh for eleven tons of CO2, accounting for 19,5% of global emission with total value of \$ 79.62 billion. Currently, there are two approaches in CO2 emission pricing such as carbon tax and carbon trading. The second mechanism is ideal for countries without carbon markets or having difficult access to carbon markets. Many measures have been taken to reduce greenhouse gas emission including application of science and technology in energy efficiency; increase of carbon sequestration and retention through forest protection, zoning for forest regeneration and afforestation.

- Regarding the potential markets of landscape/tourism services: market of landscape service is less developed than those of other FES. Up to date, countries have promoted landscape service through the establishment of protected areas or protection of natural or cultural heritage sites. However, landscape service is increasingly developed by contribution of local communities and indigenous people because landscape beauty can embrace cultural essence and architectural features; increasing and popular trend of ecotourism shall increase PFES from this service.

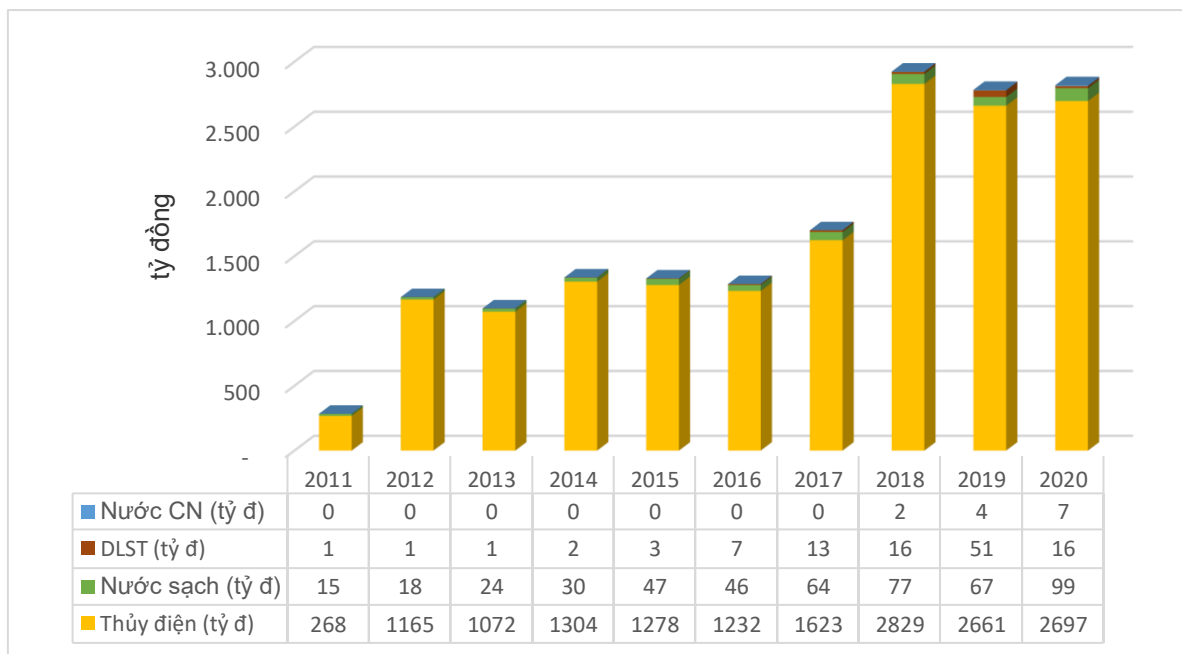
Therefore, though PFES has emerged as a new issue for a few recent decades, it has been

rapidly popular in some countries. Development of FES has been widely spread and institutionalized in legal documents in some countries.

b) In Vietnam

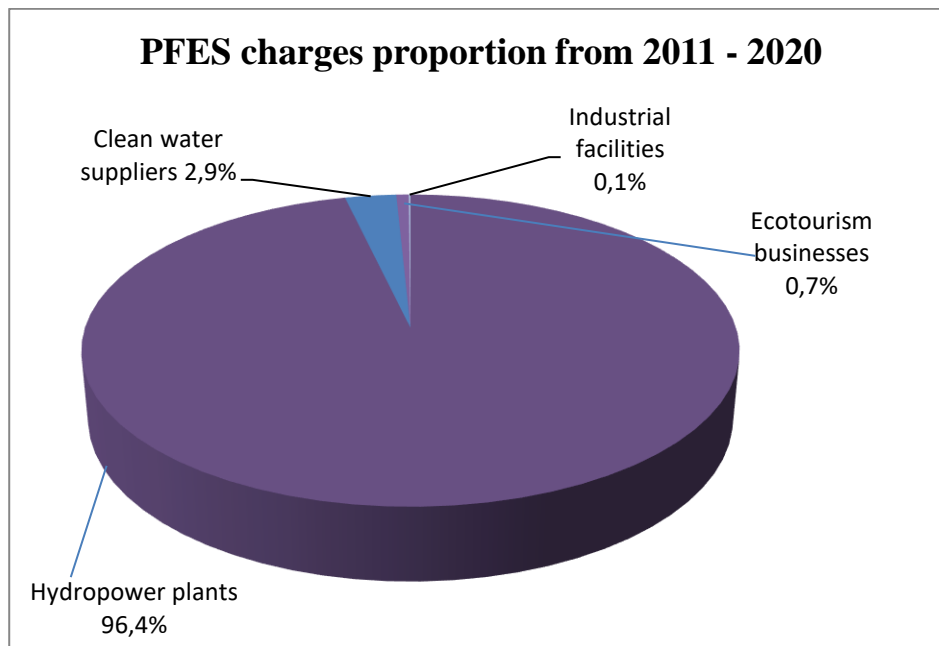
FES have been implemented in 45 provinces out of total 63 provinces nation-wide for the last 10 years (2011 – 2020). Up to date, PFES has not been applied in 15 provinces having forest because the forests of these provinces are not located in basins of hydropower plants. On another hand, these provinces have not yet taken advantages of FES such as ecotourism, clean and industrial water production, particularly carbon sequestration and retention services.

Total national FES charges from 2011 to 2020 is 16,746 billion VND with annual average of 1,600 billion VND; the figure in 2009 is 2,783 billion VND and it is expected to be 2,820 billion VND in 2020. PFES charges from hydropower plants makes up to 96.4% while only 2.9% from clean water suppliers, 0.7% from ecotourism businesses and 0.1%<sup>2</sup> from industrial facilities.



**Figure 1: PFES progress from 2011 to 2020**

<sup>2</sup> . Draft report:10-year summary on PFES implementation 2011 – 2020 and proposal for development phase 2021 – 2020. VNFF. 12/2020



**Figure 2 : PFES charges proportion from 2011-2020**

Up to now, forest carbon sequestration and retention services, greenhouse effect emission reducing services from limitation of deforestation and forest degradation for forest sustainable management have not been implemented. Under Clause 5 Article 57 for Decree 156 and Direction of the Prime Minister in Document 1586/VPCP-NN dated 26/02/2019 on formulation of the Prime Minister’s decision for pilot implementation of PFES in forest carbon sequestration and retention service in 4 provinces: Quang Ninh, Thanh Hoa, Quang Nam, Thua Thien Hua. MARD has surveyed and consulted with these four provinces, relevant ministries and has submitted to the Prime Minister since early 2020.

- 04 entities of FES payers have already made payment such as: 473 hydropower companies that are operating 478 hydropower plants have signed 478 entrusted contracts on PFES with VNFF (77 contracts) and provincial FPDFs (401 contracts); 151 clean water production and supply companies have signed 192 contracts; 73 ecotourism businesses have signed 73 contracts; 239 industrial water companies have signed 239 contracts. Two remaining entities who have not yet applied PFES are aquaculture facilities and individuals, organizations causing massive green gas emission from their production and business.

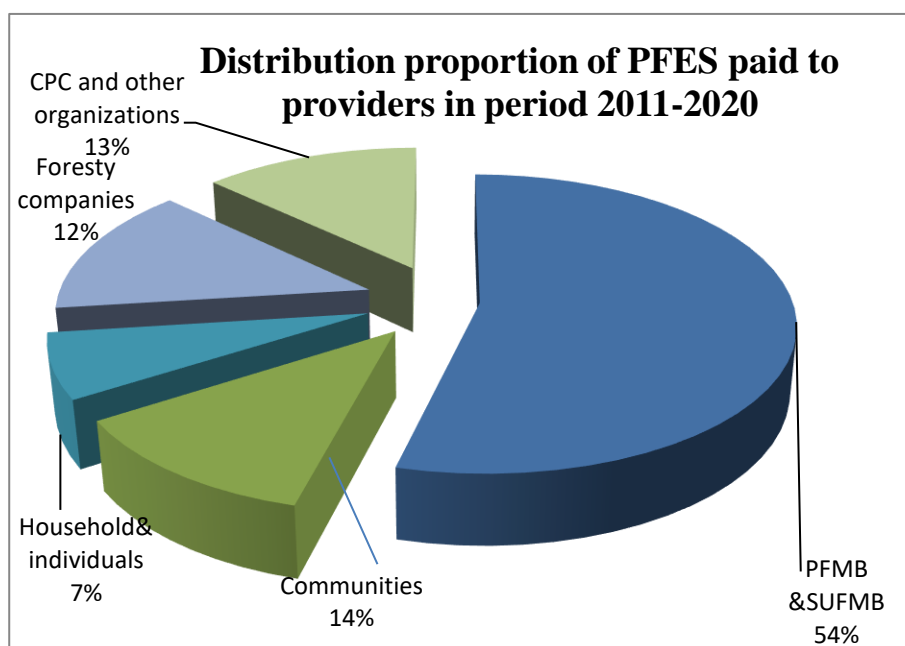
- FES providers received FES charges with amount of 13,764 billion VND including 215 PFMB and SUFMB got 9,046 billion VND, accounting for 54% of total FES charged paid to FES providers; 88 forestry companies got 1,617 billion VND, accounting for 12%; 170,089 forest owners who are households and individuals received 984 billion VND, accounting for 7%; 8,064 forest owners being communities received 1,920 billion VND, accounting for 14%; 1,432 communal people’s committee and other organizations which are not forest owners but allocated forests by the State for management received VND 1,837 billion, accounting for 13%. Thus, PFMB and SUDMB receive the most proportion, accounting for more than half of the total FES charges paid to FES providers.

**Table 2. PFES charges distributed to providers in period 2011-2020**

No	Item	Period			Amount (Billion VND)	Percentage %
		2011-2016	2017-2018	2019-6/2020		
<b>I</b>	<b>FES providers</b>					
1	PFMB and SUFMB (boards)	203	228	215		
1.1	Amount of charges (billion VND)	2.846	2.272	2.287	7.406	54%
2	Forestry companies (companies)	84	90	88		
2.1	Amount of charges (billion VND)	698	419	500	1.617	12%
3	Household/ individual forest owners (households)	133.434	159.608	170.089		
3.1	Amount of charges (billion VND)	365	280	339	984	7%
4	Community forest owners (community)	7.533	8.378	8.067		
4.1	Amount of charges (billion VND)	778	558	584	1.920	14%
5	Communal people's committee and other organizations allocated forest for management	678	1.082	1432		
5.1	Amount of charges (billion VND)	431	378	1.028	1.837	13%
<b>Total:</b>					<b>13.764</b>	<b>100 %</b>

Source: Draft report:10-year summary on PFES implementation 2011 – 2020 and proposal for development phase 2021 – 2020. VNFF. 12/2020





**Figure 3: Distribution proportion of PFES paid to providers**

#### **4. Overview on natural and socio-economic conditions of yen Bai province**

##### **4.1. Natural conditions**

##### **4. 1.1. Geographical location**

Yen Bai is a Northern mountainous province located in the center of northern midlands and mountain areas. Yen Bai shares the border with Lao Cai and Lai Chau provinces in the northwest, Ha Giang and Tuyen Quang provinces in the east and the northeast, Phu Tho province in the southeast, Son La province in the west. The total land area of the province is 688,767.3 km<sup>2</sup>.

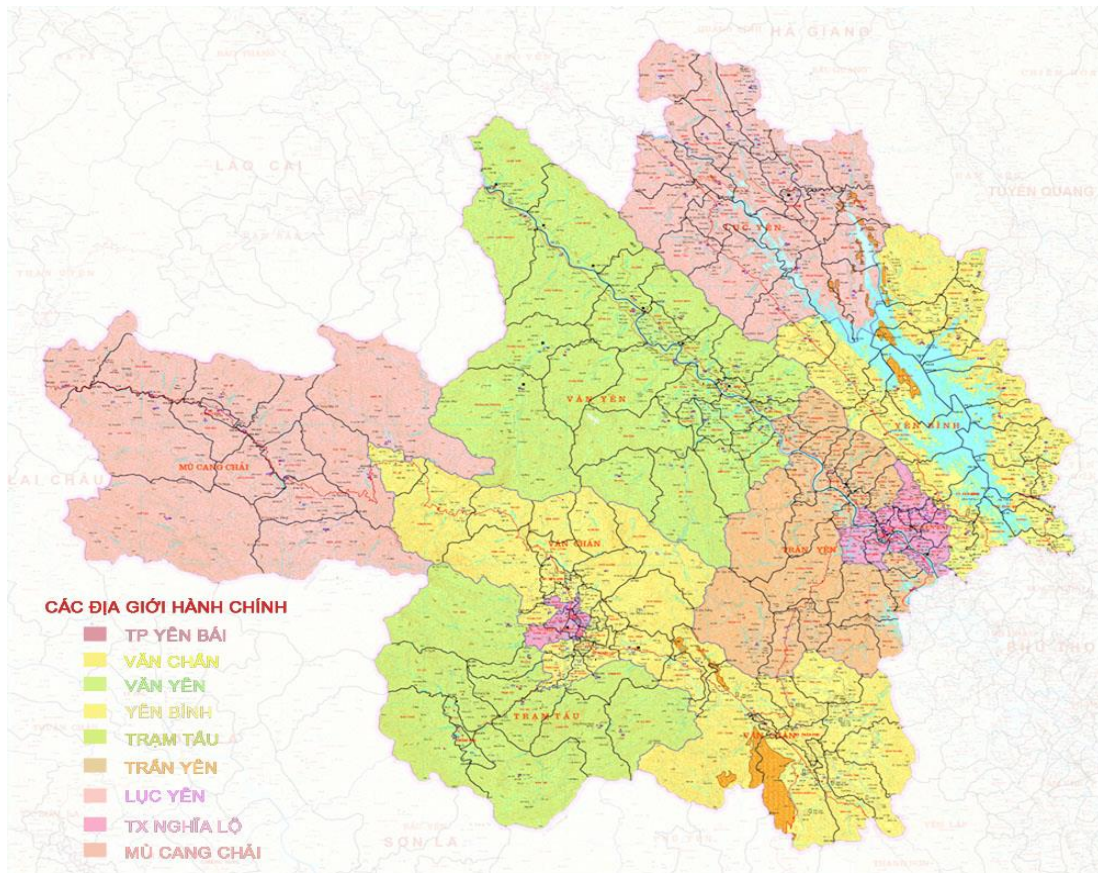
Yen Bai province has 9 administrative units, including: Yen Bai city, Tram Tau district, Mu Cang Chai district, Van Chan district, Van Yen district, Luc Yen district, Tran Yen district, Yen Binh district, Nghia Lo town; comprising of 180 communal administration units (of which 150 communes, 13 wards and 10 towns).

With the geographical location as the gateway of the northwest region, Yen Bai province is located on the midpoint of the key economic corridor of Kunming - Lao Cai - Ha Noi - Hai Phong. With the relatively diversified transport system, which has created favorable conditions and opportunities for Yen Bai to promote integration and economic and trade exchanges, cultural and social development... not only with the provinces in the region, the great economic centers in the country, but international economic exchanges.

##### **4.1.2. Terrain features**

Yen Bai is situated in the northern mountain, with the high terrain from the southeast to the northwest. Yen Bai's terrain is complicated and divided into 2 regions: the Highland and the Lowland. The Highland region with the average altitude of over 600m accounts for 67,56% of the province's total area. In this region the inhabitants are thinly populated. It has potentials of land, forest and mineral and capability of attracting investment for socio-economic

development. The Lowland region with the altitude of under 600m, formed mainly by low mountains, hills, and valleys, accounts for 32,44% of the province's total area.



Source: Yen Bai portal -2020

#### 4.1.3. Climate

Yen Bai has the tropical monsoon climate with the average temperature of 22°C - 23°C (highest temperature reaches 37°C - 39°C, and lowest ranges from 2°C - to 4°C), the average rainfall of 1,500 – 2,200 mm per year, and the average humidity of 83 – 87%, which are favorable for agriculture and forestry development. Luc Yen - Yen Binh region with the average altitude of under 300 m, the average temperature of 20°C- 23°C has the most water surface area of the province, like Thac Ba lake with the area of 19,050 hectares, which is favorable for food crops, forestry, aquaculture and tourism.

#### 4.2. Natural resources

##### 4.2.1. Land resources

Yen Bai has a total natural land area of 688,767.3 ha. Of which, the agricultural and non-agricultural land areas are 588,094 ha and 54,478 ha, making up 85.40% and 7.89% respectively. The unused land is 46,195 ha, equivalent to 6.71%. The forest coverage rate stands at over 63%.

The province has many types of soil suitable for growing paddy rice, crops, yearly and perennial industrial trees; afforestation for protection and economic development.

With more than 245,583.8 ha of natural forest and 188,002.4 ha of plantation forest, Yen Bai has strength to develop the industry of processing wood and forest products. The timber output reaches nearly 520,000 m<sup>3</sup>, including acacia, linden, eucalyptus, etc. Crataegus is planted and planned for expansion in Tram Tau and Mu Cang Chai – the two highland districts with area of 9,200 ha (output of 5,000tons/year) and over 120,000 tons of bamboo-family plants. Forest protection and development is oriented towards sustainable management (under FSC) to increase exporting timber value. By the end of 2019, the total provincial area of 4,037.5 ha of acacia mangium forest was awarded for forest sustainable management according to FSC. By 2025, the production of Acacia large timber forests is expected to reach 27,000ha. Yen Bai has total tea planting area of 7,655 ha, the largest cinnamon planting area and among the best quality with 78,000 ha.

With over 2,000 ha of pasture, and grass areas under forest canopy, the locality boasts a great advantage for breeding buffaloes, cows, goats and poultry.

#### 4.2.2. Water resources

Yen Bai has three major systems of rivers and streams, including the Hong (Red) River, the Chay River and the Nam Kim Stream with a total length of 320 km and a basin area of over 3,400 km<sup>2</sup>. The system of tributaries is fairly evenly distributed throughout the province. Because rivers and streams originate from high mountains, Yen Bai boasts great potential for supplying water for developing hydropower plants and people's daily activities. The Hong River section flowing through Yen Bai has a length of 100 km, with 48 tributaries (including four large canals: Thia, Hut, Lau and Lao), and a basin area of 2,700 km<sup>2</sup>. Meanwhile, the Chay River section running through the locality has a length of 95 km, with 32 tributaries and a catchment area of 2,200 km<sup>2</sup>. Thac Ba hydropower plant - the first of its kind in Vietnam was built in the downstream area of the Chay River. The Nam Kim Stream - a tributary of the Da River - has a total area of 600sq.km. It has great potential for developing hydropower plants. Yen Bai has 20,913ha of ponds and lakes. Covering over 19,500ha of water surface, the Thac Ba Lake has great potential for tourism development, and aquaculture.

#### 4.2.3. Forest resources

Forest and forest land are resources and potential for development of Yen Bai. Yen Bai's flora is very diverse, including many different species and families, with rare forest products, precious medicinal plants, and producing paper plants such as bamboo families. According to the 2019 land yearbook, Yen Bai had 523.021 ha of forest land, accounting for 75.93% of the natural land area, of which:

- 334,086.5 ha of production forest, making up 48.5% of the natural land area, mainly in areas growing material plants for producing paper and cinnamon planting areas
- 152,787.3 ha of protection forest, accounting for 22.18% of the natural land area, mainly in 3 areas: the Da River protection forest area, the Hong River protection forest area and the Chay River protection forest area.
- 36,147.3 ha of SUFs, equivalent to 5.24% of the natural land area, concentrating in Mu Cang Chai and Van Yen districts.

#### 4.2.4. Mineral resources

Yen Bai boasts many types of mineral resources which are distributed in 257 mines, mainly in the groups of energy, minerals for producing construction materials, industrial minerals, metal, and mineral water, etc. Construction material is great potential for cement production.

#### 4.3. Economic potential

##### 4.3.1. Economic advantageous sectors

- Yen Bai has advantages for agricultural - forestry development with raw material areas; afforestation and paper, artificial wooden board processing; cinnamon, tea and coffee planting and processing; cassava, fruit planting and processing; aquaculture. With diversified mineral resources, the province has favorable conditions in minerals exploiting and processing such as gemstones, kaolin, iron ... and construction materials production: cement, bricks, porcelains, sawn stone.

Yen Bai is not only located at the gateway to the Northwest of Vietnam, on the key economic corridor of Kunming - Lao Cai - Hanoi - Hai Phong, it is the center of traffic connection of northern mountainous provinces. In particular, the province has many unique cultural essences with strong national identity ... formulating an image of rich potentials, strengths, a new land promising for investment opportunities.

The completion and operation of Noi Bai - Lao Cai expressway has shortened the distance from Yen Bai to key economic regions such as to Hanoi capital to less than 120 km; Lao Cai border gate to less than 130 km; Hai Phong port to less than 190 km. At the same time, The expressway also helps more convenient goods exchange from Yen Bai to neighboring economic regions such as Ha Giang, Tuyen Quang, Phu Tho, Vinh Phuc, Son Tay, Hoa Binh, etc. The above conditions have been favorable for Yen Bai to enhance cooperation and economic development exchange with other provinces and cities domestically and internationally.

##### 4.3.2. Economic structure

The economic structure continues to shift towards a gradual decrease in proportion of the agricultural sector, a gradual decrease in proportion of industry-construction and service sectors: in 2019: the agricultural, forestry and fishery sectors account for 21.42. % (in 2018 it was 21.9%); industry - construction accounted for 26.63% (in 2018 it was 26.24%); services accounted for 47.15% (in 2018 it was 47.08%); subsidies products accounts for 4.79%. The growth rate of total provincial product (*compared with prices of 2010*) reached 7.03%; the total gross provincial product per capita reached over 38 million VND; total provincial budget revenue: 3,250 billion VND; Value of export goods: 170 million USD; total investment capital: 15,000 billion VND. The forestry proportion in structure of agriculture, forestry and fishery sector increases from 21.71% in 2015 to 26.07% in 2019 and is expected to reach 26.24% by 2020. The value of forestry production (*compared with prices of 2010*) in 2015 reached 1,223 billion VND, estimated to be 1,950 billion VND in 2020.

##### 4.3.3. Tourism resources

Yen Bai is a mountainous province with abundant of natural beautiful landscapes, which brought into potential for construction investment into ecotourism facilities and scientific research.

Thac Ba lake has an area of over 19,000 hectares with over 1300 islands and islets along with beautiful caves in the limestone mountains such as Thuy Tien cave, Xuan Long cave, Cao Bien mountain, Chang Re mountain. Thac Ba lake is called as "*In-land Ha Long Bay*". The lake is potential for big-scaled ecotourism development.

The provincial Western region (Van Chan and Nghia Lo town) has Muong Lo paddy field - the second largest rice bowl in the Northwest. Unique landscapes and tourist attractions such as Suoi Giang, located at an altitude of nearly 1,400 meters – are home to hundreds of years old Shan tea, Ban Bon hot spring - natural hot water with a temperature of 350C - 450C; Mu Cang Chai terraced field with 2,300 ha has been awarded as a National natural heritage; Na Hao nature reserve, Van Yen district; Dam Van Hoi lake in Tran Yen district; Species and habitat conservation area of Che Tao commune, Mu Cang Chai district, scenic landscapes at Thac Ba lake ... are very ideal for the development of eco-resorts, system of single-family motels with highland architecture.

Besides, Yen Bai also has many long-standing cultural and historical relics aiming at cultural and spiritual tourism such as Dong Cuong Temple, Nhuoc Son Temple, Tuan Quan Temple; Temple area - Dai Dai Temple (Hac Y Temple), Thac Ba Temple, Huong Thao Cave, Ngoc Am Pagoda, etc. Culinary cultures of the ethnic groups and rich intangible culture such as Khèn dancing, love song singing, etc. are factors to attract domestic and foreign tourists.

## II. OVERVIEW OF THE PFES POLICY IMPLEMENTATION IN YEN BAI, THE PERIOD OF 2016-2020

### 1. Types of forest environmental services

- Up to date, 2 types of environmental services those are (i) Soil protection, restriction of erosion and sedimentation of reservoirs, rivers and streams; and (ii) Regulation and maintenance of water sources for production and social life, have been deployed through operation of 27 hydropower plants, provision of input water for 8 clean water supply facilities, and provision of water for 23 industrial production facilities in the province.

- The service of protecting and maintaining natural landscape beauty, conserving biodiversity of forest ecosystems for trading in tourism services has not been implemented because the infrastructure in the potential areas is poor, and there is no plan of the tourism sites in the potential forests according to the Tourism Law. However, the tourism activity is also implemented at the small scale and spontaneously with little income in some areas of the province.

- The service of spawning grounds, food sources, natural breeding stock, water resources from forests and environmental elements and forest ecosystems for aquaculture is under the process of reviewing and identifying the service users and providers. Moreover, aquaculture facilities using water from the forest are mainly households, or business entities suffering loss

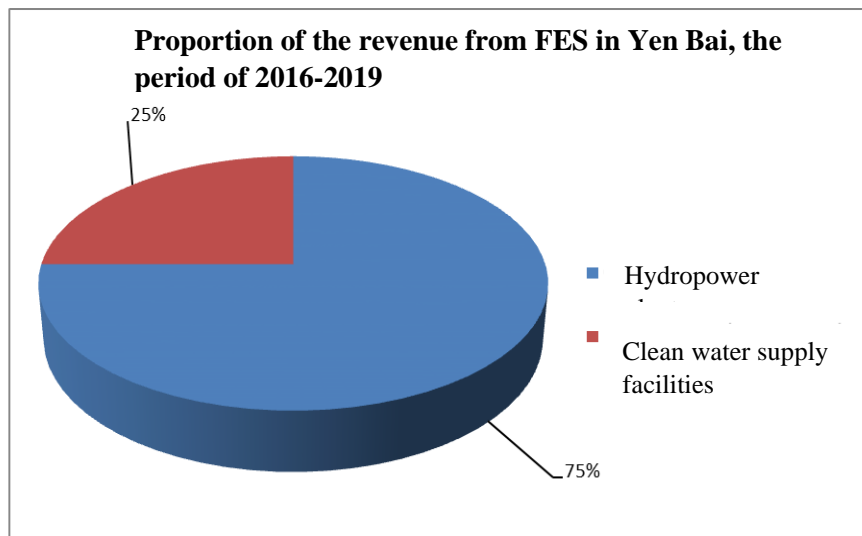
due to climate impacts. Their operation is at small scale and in the scattered manner. Additionally, it is very difficult to identify the enterprises entering into association contracts with households or individuals in aquatic product creation as specified in the Decree No. 156/2018/ND-CP.

- The service of absorbing and storing carbon of forests; reducing greenhouse gas emission by limiting forest loss and degradation; sustainable forest management and green growth has not been implemented because the Government has no legal document on this in accordance with the Forest Law.

## 2. The revenue from forest environmental services in the period of 2016-2019 (see the Annex 03)

- Total revenue from FES of the province from 2016 to 2019 was 390.05 billion dong, 97.51 billion dong/year on the average. Accordingly, the revenue from FES in 2018 and 2019 were 126.4 billion dong and 129.3 billion dong respectively. It is higher than the revenues of 2016 and 2017 because the payment rate for hydropower increased from 20 dong/kwh up to 36 dong/kwh), and for the clean water supply facilities increased from 40 dong/kwh up to 52 dong/kwh) as well as the FES payers are expanded.

- In terms of the revenue proportion: FES revenue from the hydropower accounts for 75% while from the clean water supply facilities accounts for only 25%.



*Figure 4: Proportion of the revenue from FES in Yen Bai, the period of 2016-2019*

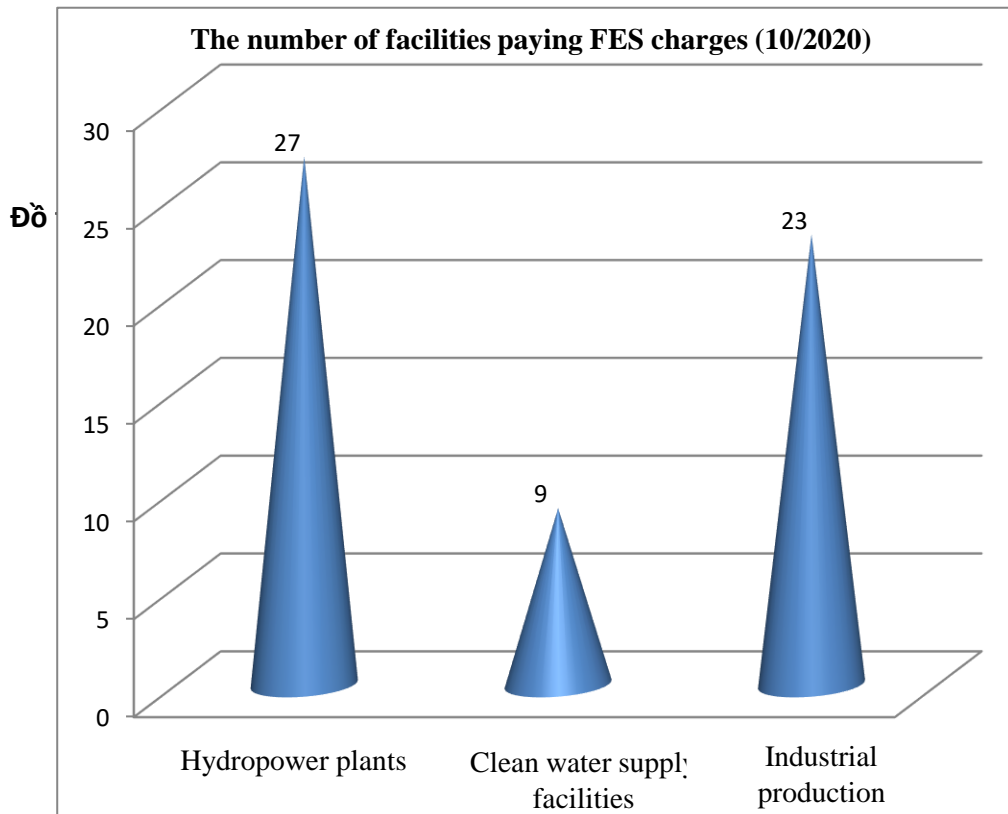
- The first half of 2019: the total revenue was 31.9 billion dong, of which the charges transferred through VNFF was 17.9 billion dong, collected by the province was 14 billion dong. In 2020, the industrial production facilities using water directly from the forest were added as a payer of FES with the collected amount of 52.8 billion dong.

## 3. The user of forest environmental services

By October 2020, VNFF has signed 47 contracts (with 59 entities) for entrusted payment of forest environmental services in the province, of which 23 contracts with 27 hydropower plants, 8 contracts with 09 clean water supply facilities, and 16 contracts with 23 industrial

production facilities. 03 entities, including aquaculture, eco-tourism business, and producers and traders causing massive greenhouse gas emission, have not entered into the contract.

There have been a total of 44 facilities of hydropower and clean water supply at central and provincial levels paying the FES charges for the Provincial FPDF, including 44 provincial facilities (23 hydropower plants and 8 clean water supply facilities), and 13 central facilities (12 hydropower plants and 01 clean water supply facilities).



*Figure 5. The number of entities paying FES charges (10/2020)*

#### **4. The providers of forest environmental services**

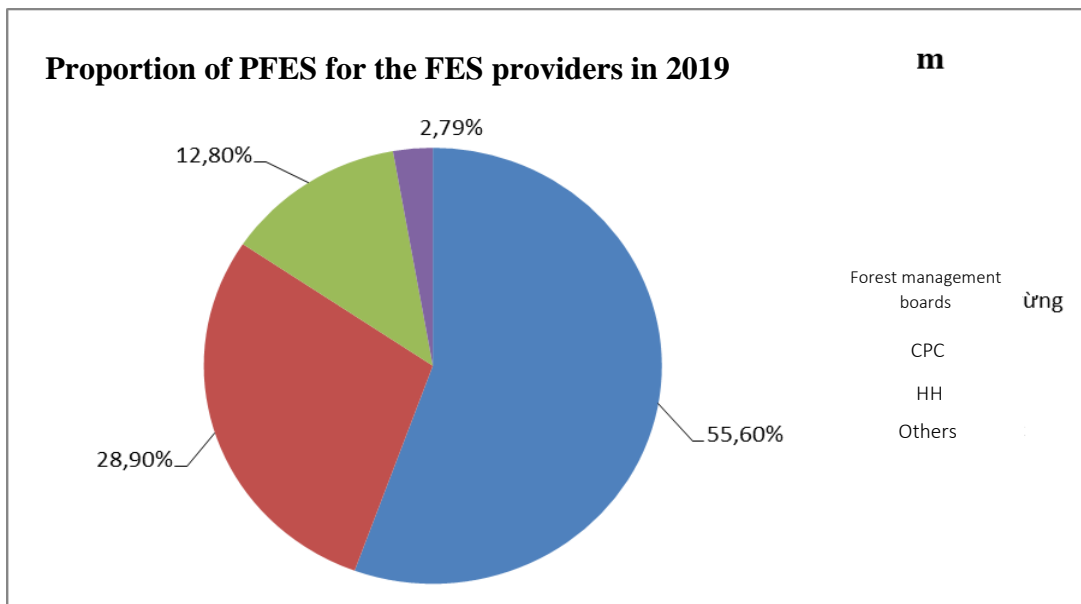
In the period of 2016-2020, there were 05 groups of FES providers receiving the FES charges, including (i) forest management boards, (ii) forest companies, (iii) forest owners as households, individuals, (iv) commune people committees, (v) others. Basically, such groups have not changed over the years, except the household, individual forest owners.

By October 2020, the providers, including 4 forest management boards, 5 forest companies, 19,530 household forest owners and 84 commune people committees, have received the FES charges.

#### **5. Payment for forest environment services (see Annex 04)**

In 2018, 115.4 billion dong was paid to the providers, of which 71.61 billion dong for the forest management boards, accounting for 62%; 33.37 billion dong for CPCs, accounting for 28.4%; 8.79 billion dong for individuals and households, accounting for 7.6%; and 2% for others.

In 2019, 121.7 billion dong was paid to the providers, of which 67.71 billion dong for the forest management boards, accounting for 55.6%; 35.29 billion dong for CPCs, accounting for 28.9%; 15.68 billion dong for individuals and households, accounting for 12.8%; and 2.7% for others.



**Figure 6: Proportion of PFES for the FES providers in 2019**

In general, the amount of money that VNFF has paid to FMBs and CPCs accounts for 80-90% of the total amount of FES charge. Then, FMBs and CPCs contracted with households, individuals and communities for forest protection. In 2019, they contracted with 22,217 households and individuals, 2 communities for protection of an average of 15.5 ha per households. According to the survey and consultation with forest owners, the amount of FES charge that the forest owner as state organizations (e.g. Tram Tau Protection Forest Management Board, and Mu Cang Chai species – landscape Conservation Area Management Board) paid for contracted households, individuals, household groups and communities accounts for 80-100% of the total amount they received.

**6. The rate of forest environmental service charge**

- The rate of FES charge per ha of forest is identified by merging the amounts of FES charge of all hydropower plants, clean water supply facilities, and industrial production facilities which are located in the same river or stream and use the FES of the neighboring areas, then averaging out per ha of such forest. This also takes into account the PPC’s decision to be in line with the province’s socio-economic, political and security conditions but it is not allowed to exceed the ceiling rate regulated by the Government.

In 2019, Yen Bai applied 3 FES charge rates, in particular:

Rate 1: 800,000 dong/ha/year, applying for Tram Tau and Mu Cang Chai districts.

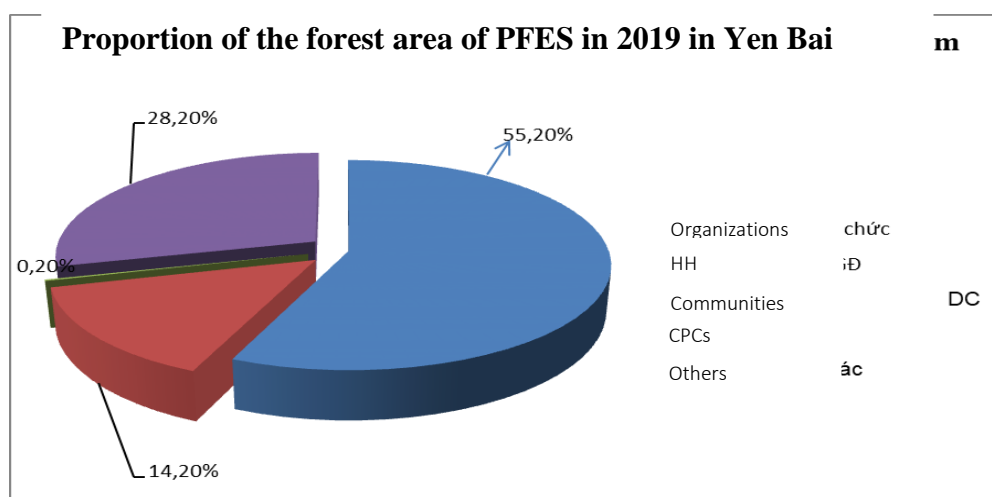


Rate 2: 677,000 dong/ha/year, applying for Na Hau Nature Conservation Area; the forest areas of Mu Cang Chai District Protection Forest Management Board located in Van Chan district; and the forest areas managed by CPCs in the region II and III.

Rate 3: 600,000 dong/ha/year, applying for the forest areas managed by CPCs in the region I; households, individuals and village communities; forest companies; and others.

**7. The forest area of PFES**

In 2019, total area of forest eligible for PFES was 199,496.86 ha, of which 110,270.14 ha (accounting for 55.2%) of the forest owners as organizations and enterprises; 28,341.96 ha (accounting for 14.2%) of the forest owners as households, individuals; 82.84 ha (accounting for 0.2%) of the forest owners as communities; 56,349.92 ha (accounting for 28.2%) of the forest managed by CPC; and 4,452 ha (accounting for 2.2%) of the forest planted by households, individuals and communities plant for a long time without conflicts or encroachment but not officially assigned by the State (Table 05).



*Figure 7: Proportion of the forest area for PFES in 2019*

**8. Form and method of payment for FES**

Up to now, Yen Bai has just applied the indirect payment form for environmental services, such as: the provincial FPDF has signed 22 contracts with the hydropower plants, 8 contracts with the clean water production and supply entities, 15 contracts with the industrial production facilities. The Decree No. 156/2018/ND-CP specifies that the direct payment form is only applied for the ecotourism business entities and the aquaculture entities. However, Yen Bai has not yet deployed two these types of service so that the direct payment has not been applied.

The FES charge is paid for the forest management boards, forest companies, CPCs and other organizations via bank transfer. Since 2018, the FES charge has been paid for households, individuals, and communities in cash, or via the provincial post, bank transfer or Viettel Pay. The FPDF’s Steering Committee in collaboration with CPC and district Forest Protection

Development has closely monitored the payment by the provincial post, Vietinbank, and Viettel Yen Bai in order to ensure that the FES charge is paid publicly, transparently and sufficiently for the right beneficiaries.

**Table 3: Summary on the PFES implementation results in Yen Bai, the period of 2016-2020**

No.	Items	Results
1	<b>Types of FES</b>	<ul style="list-style-type: none"> <li>- 2 types of services have been deploying, including: (i) Soil protection, restriction of erosion and sedimentation of reservoirs, rivers, and streams; and (ii) Regulation and maintenance of water sources for production and social life.</li> <li>- The type of service of ecotourism business has not been implemented because: (i) the infrastructure in the potential areas is poor, (ii) there is no planning for the tourism sites in the potential forests.</li> <li>- The type of service for aquaculture is under the process of reviewing and identifying the service users and providers because: (i) the aquaculture are at small scale, scattered, mainly are households with little income; (ii) the aquaculture business entities suffering loss due to the climate impacts; (iii) it is very difficult to identify the enterprises entering into association contracts with family households or individuals in aquatic product creation; (iv) it only applies the direct payment form that takes time for negotiation and agreement.</li> <li>- The type of environmental service of forest carbon sequestration and retention has not been implemented because the Government has not had a legal document stipulating this.</li> </ul>
2	<b>FES charge rate</b>	<p>Rate 1: 800,000 dong/ha/year, applying for Tram Tau and Mu Cang Chai districts.</p> <p>Rate 2: 677,000 dong/ha/year, applying for Na Hau Nature Conservation Area; the forest areas of Mu Cang Chai District Protection Forest Management Board located in Van Chan district; and the forest areas managed by CPCs in the region II and III.</p> <p>Rate 3: 600,000 dong/ha/year, applying for the forest areas managed by CPCs in the region I; households, individuals, and village communities; forest companies; and others.</p>

3	<b>Revenue from PFES in the period of 2016-2019</b>	<p>+ Total revenue from PFES of the whole province from 2016 to 2019 was 390.05 billion dong, on average of 97.51 billion dong per year. The revenue from PFES in 2018 and 2019 were respectively 126.4 billion dong and 129.3 billion dong.</p> <p>+ In terms of proportion: PFES from the hydropower plants accounts for up to 75% of the total revenue, while from the water production and supply entities accounts for only 25%.</p>
4	<b>The forest area of PFES</b>	<p>In 2019, total area of forest eligible for PFES was 199,496.86 ha, of which 110,270.14 ha (accounting for 55.2%) of the forest owners as organizations and enterprises; 28,341.96 ha (accounting for 14.2%) of the forest owners as households, individuals; 82.84 ha (accounting for 0.2%) of the forest owners as communities; 56,349.92 ha (accounting for 28.2%) of the forest managed by CPC;</p>
5	<b>Forms and methods of PFES</b>	<p>- The provincial FPDF has signed 22 contracts with the hydropower plants, 8 contracts with the clean water production and supply entities, 15 contracts with the industrial production facilities. The direct payment is not applicable.</p> <p>- The FES charge is paid for the entities as organizations via bank transfer. Since 2018, the FES charge has been paid to households, individuals, and communities in cash, or via the provincial post, bank transfer or Viettel Pay.</p>

#### 9. Mechanism of PFES distribution of VNFF

In implementation of the Decree No.99/2010/ND-CP and the Decree No. 156/2018/ND-CP, total revenue from the forest environmental services users is deducted 10% for management fee and 5% for the contingency fund. The remaining amount is distributed for the forest management boards, forest companies, households, individuals and organizations who are assigned for forest management by the State. The table 04 shows that the revenue from FES providers in 2016 was 74 billion dong, in 2019 was 121.7 billion dong and in 2020 was 96.7 billion dong.

Management fee of 10% covers costs such as salary, allowance and contributions for the members of the Fund Administration Board; management allowance for the members of the Fund Management Council and the Fund Control Board; wage; payment for the public services, stationaries, communication; fees for meetings, workshops; per diem; fees for supporting development of sustainable forest management plans and forest certification; payment for reviewing and identifying the forest areas providing the environmental services, technical activities to monitor and assess the quality of the forest environmental services; fees for supporting activities relating to PFES at district and commune levels; workshops and

training; procurement and repairing of the assets for the Fund's operation, etc.

The contingency fund is mainly used to support the areas that have the low FES charge rate (dong/ha/year) and will be refund to the FES providers in accordance with the regulation at point d, clause 2, article 70 of the Decree No. 156/2008/ND-CP.

**Table 4: The quantity and the paid amount of the FES providers**

The FES providers	2016		2017		2018		2019		2020	
	Q'ty	Paid amount (billion dong)	Q'ty	Paid amount (billion dong)	Q'ty	Paid amount (billion dong)	Q'ty	Paid amount (billion dong)	Q'ty	Paid amount (billion dong)
I. Total amount		74		66.7		115.4		121.7		96.7
Of which:										
1.Forest Management Boards (Boards)	4	63.93	4	50.26	4	71.61	4	69.71	4	69.75
2. Forest companies (companies)	3	0.05	3	0.15	6	0.71	5	0.44	7	0.50
3.Other organizations (organizations)	2	1.23	2	1.30	1	0.19	1	0.53	1	0.16
4. Forest owners as households, individuals (households)	21,847	3.49	23,253	6.20	14,414	8.79	17,538	15.68	19,530	6.82
5. CPCs		5.25		10.25	93	33.37	84	35.29	84.00	19.32

Source: Yen Bai FPDF, 2020

## 10. Overall evaluation

### a) Advantages

- PFES has quickly and effectively come to the life, creating a new stable and sustainable financial source besides the state budget to support the forest management, protection and development; the quality of the forest has been improved remarkably.
- Contributing to mobilize the social resources for the forest protection and development; increasing income of the foresters, especially in the rural, ethnic minority areas; resolving difficulties in capital for the forest management boards and forest companies, and decreasing pressure on the state budget to cover the forest protection.
- Contributing to raise awareness of and responsibility for the forest protection and development of local people; restricting the legal violations of forestry.
- Utilizing the service potentiality of the forest ecosystem, especially water sources regulation and maintenance; soil protection and restriction of erosion and sedimentation of reservoirs, rivers and streams.

### b) Shortcomings, limitations and difficulties

- According to the Report No.92/BC-QBV&PTR Yen Bai on 16 October 2020, some entities have still owed the FES charge with a total of 2,686 million dong.
- It is difficult to review and identify the forest area of the forest owners providing the forest environmental services, especially of the forest owners as households and individuals. This is because there are few technical officers, the forest areas are located in the whole province; there is a large number of the forest owners as households, individuals; capacity of the commune-level officers is limited; engagement of the commune-level government is insufficient; and monitoring of the forest changes is irregular, therefore, the data of the forest area and the forest owners as households, individual is not sufficiently updated into the annual and quarterly forest changes at commune, district and provincial levels.
- The Fund Administration Committee has actively developed and submitted the plan of financial autonomy to Department of Finance, Department of Home Affairs, and Department of Agriculture and Rural Development for appraisal and submission to PPC to give the Fund the right to financial autonomy in the period of 2019 – 2020; however, this plan has not yet approved.
- Some households, who are paid a small amount of FES charge from thousands dong to tens of thousands dong, are not happy to receive the money that makes difficult for the units (banks, posts) to support the payment; encouragement and awareness raising of opening the bank account also face the challenges.
- The total number of the Fund's employees is 15 ones, however, the Fund now has only 12 staff with an overwhelming workload that makes difficult to implement the assigned tasks.

- The contract for direct payment between the aquaculture enterprises and the forest owners has not been implemented in accordance with the Decision No. 1566/QĐ-UBND of the PPC.

- The water use of the industrial production facilities have not been monitored and inspected but is mainly self-declared by the facilities, thus it does not ensure the right and sufficient amount of the real payment.

The reasons:

- Over the past years, Yen Bai has undergone flood and landside, etc. every year. The natural disaster has adversely damaged some hydropower plants in the province, thus collection of the FES charge from them also meet difficulties.

- Collaboration between the VNFF and the state management agencies in inspecting the implementation of the PFES policy of the service users is not close and synchronous; involvement of the state management agencies in handling the users in debts for PFES has not been paid attention; therefore, some entities and companies intentionally do not pay the FES charge.

- The guiding documents issued by the ministries and sectors are not sufficient, updated and synchronous that partially affects the implementation of the organizational apparatus and the financial mechanism for the activities of the provincial FPDF.

- The administration penalty at the rate of from 500,00 dong to 50 million dong applicable for the users who do not pay or pay inadequately the FES charge under the entrustment contract is too light and unable to deter them. The users can appropriate the FES charge-to-be-paid for other purposes to make the higher profits than the amount they are fined.

- The forest owners (the protection forest management board) and enterprises have not agreed on the contract in case of the direct payment applicable.

- Some industrial production facilities have not invested in the equipment (meters) to measure the used water volume but mainly taken and used water directly from reservoirs, rivers, streams and underground water.

### III. PROPOSED SCENARIOS AND ROADMAP TO IMPLEMENT PFES IN YEN BAI, THE PERIOD OF 2021-2025.

#### 1. Orientation and targets

- FES shall be a stable and sustainable financial source mobilized from the society with the additional revenue of 116.881 billion dong from 2021 to 2025, and 42.533 billion dong per year by 2025 that significantly contributes to the successful implementation of the province's forestry development target.

- To establish the sustainable economic relationship between the FES providers and users; to support protection of the forest area of more than 200,000 ha of the province and other necessary forestry-related activities.

- To contribute significantly to poverty reduction, livelihood improvement, and rural development in the mountainous area where the majority of its population are ethnic minorities.

**2. Proposal of expanding FES and FES payers in accordance with the Decree No.156 of the Government**

**2.1. Proposed scenarios and roadmaps to implement payment for the forest carbon absorption and storage service (service iii)<sup>3</sup>**

There are now no legal document guiding the implementation of the service of forest carbon absorption and storage; reduction of greenhouse gas emissions by measures of preventing deforestation and forest degradation. However, it can be implemented by 3 ways as below:

2.1.1. Proposing the scenario to implement payment for the forest carbon absorption and storage service (service iii);

2.1.1.1. Collecting the service charge of forest carbon absorption and storage from domestic organizations and individuals causing the large-flow emission sources;

- The Law on Forestry 2017 (clause 2, Article 63) stipulates that producers or traders causing massive green gas emission have to pay service charges for absorbing and storing carbon in forests.

- The Decree No.40/2019/ND-CP dated 13 May 2019 of the Government on amendment to decrees on guidelines for the Law on Environment Protection (Article 3 Amendments to Government's Decree No. 38/2015/ND-CP dated April 24, 2015 on management of waste and scrap (hereinafter referred to as Decree No. 38/2015/ND-CP) specifies the list of emission sources with great flow of which the fields of coal-fired power plants, cement and steel producers are subject to payment for the forest carbon absorption and storage service.

**Table 5. The list of emission sources with great flow**

No	Types	Characteristics
1	Steel production	At least 200,000 tons/year
2	Thermoelectric	All, except for thermal power plants entirely using gas fuel
3	Manufacture of clinkers and cements	All
4	Manufacture of chemicals and chemical fertilizers	At least 10,000 tons/year
5	Refining and petro-chemistry	All
6	Facilities using steam boiler	At least 20 tons/hour (for total capacity of boilers), unless entirely using gases and diesel oil
7	Manufacture of glass	At least 10,000 tons of product/year, unless entirely using gas fuel

<sup>3</sup> The service of forest carbon absorption and storage; reduction of greenhouse gas emissions by measures of preventing deforestation and forest degradation, sustainable forest management



8	Manufacture of bricks, roofing tiles	Total capacity of at least 100 million of bricks, roofing tiles, unless entirely using gas fuel
9	Incineration of domestic solid waste, conventional industrial solid waste	At least 3 tons/hour
10	Incineration of hazardous waste; healthcare waste	At least 0,5 tons/hour
11	Facilities using thermal oil heater	At least 3,5 million kcal/hour (for total capacity of heaters), except for entirely using gas fuel

- MARD submitted to the Prime Minister the draft Decision on pilot PFES for the forest carbon absorption and storage service in January 2020 that proposed to pilot in 4 provinces of Quang Ninh, Thanh Hoa, Quang Nam and Thua Thien Hue; 2 fields of coal-fired power and cement production are subject to payment for the forest carbon absorption and storage service. The expected payment rate for this service is 2100 dong/ton of Clinker (equivalent to 1.35 USD/ton of CO<sub>2</sub>.)

The assumption is that Yen Bai province has 2 cement plants of which their production output is not more than 1.5 million tons of clinkers per year. The emission factor is 0.85 tons of CO<sub>2</sub> per ton of clinker (source: the Vietnam Forests and Deltas Project)<sup>4</sup>. The total of CO<sub>2</sub> emission of 2 plants shall be: 1.5 tons of Clinker x 0.85 tons of CO<sub>2</sub>/ton of Clinker = 1,275,000 tons of CO<sub>2</sub> per year. The plants which invest in new technologies to reduce emission and are recognized by the functional agencies shall be eligible for remission of the service charge. The payment rate proposed by MARD is 2,100 dong/ton of Clinker.

The amount collected from such entities is 3.15 billion dong per year.

1.5 tons of Clinker/year x 2,100đ/ton of Clinker = 3.15 billion dong/year.

#### 2.1.1.2. Carbon credit business to the world market

The Decision No. 1775/QĐ-TTg dated 21 November 2012 of the Prime Minister approving Project of greenhouse gas emission management; management of carbon credit business activities to the world market assigns MARD to assume the prime responsibility and coordinate with the relevant ministries and sectors to study and develop and promulgate documents guiding the localities, agencies, organizations and enterprises associated to carry on business of carbon credits obtained from forest on the market outside the Kyoto Protocol (clause 12, Appendix of the Decision). Recently, the Paris Agreement on Climate Change (2015) which replaced the Kyoto Protocol in 2020 encourages countries to trade the carbon credit. This is a potential income source of forest environmental services.

Carbon credit trading can be implemented by 2 ways:

<sup>4</sup> Research report on pilot payment for the forest carbon absorption and storage service in Quang Ninh and Thanh Hoa - 2019 - MARD.

(i) Participation in the regulated market of carbon credit trading (official). Yen Bai PPC on behalf of the forest owner can sell the carbon credit to the foreign buyers under the framework of Paris Agreement on climate change.

MARD signed the Emissions Reductions Payment Agreement (ERPA) with the World Bank (the trustee of the Forest Carbon Partnership Facility), accordingly, MARD on behalf of the forest owners of 6 North Central provinces (Thanh Hoa, Nghe An, Ha Tinh, Quang Ninh, Quang Tri, Thua Thien Hue) shall sell 10.3 million tons of CO<sub>2</sub> (from 2018-2024) at the price of USD 5/ton of CO<sub>2</sub>. Total agreement value shall be USD 51.5 million (equivalent to 1,194 billion dong with the exchange rate of 23,200 dong/USD).

(ii) Participation in the voluntary carbon market to sell the carbon credit by projects that means the forest owners as organizations, enterprises, households and individuals can sell the carbon credit from their forest areas to the foreign investors.

a) The estimated capacity of the forest carbon absorption and storage of Yen Bai province.

- The method of determining the capacity of the forest carbon absorption and storage is below:

The method mentioned in the “*Research report on pilot PFES for the forest carbon absorption and storage service*” of MARD (2019) is used to measure the forest carbon stock.

The reference level (RL) of the forest types is determined by their wood reserve (m<sup>3</sup>/ha). From that, we can measure the amount of biomass (ton/ha), then the carbon and carbon dioxide (CO<sub>2</sub>) stocks. *The forest carbon stock is the amount of carbon that has been sequestered from the forest* and measured by the following steps:

**The forest reserve → Biomass → Carbon → CO<sub>2</sub>**  
**m<sup>3</sup>/ha                      ton/ha                      ton/ha                      ton/ha**

This research focuses on 2 main forest carbon storage tanks which are the aboveground biomass and underground biomass but does not include other 4 carbon storage tanks related to the forest, namely dead wood, dead foliage, carbon stored in forest soils, exploited timber and forestry products. This method is applied by World Bank for the Emission Reduction Program in 6 north-central provinces (WB-ERPD). The CO<sub>2</sub> absorption capacity of each forest type is measured on the basis of its average annual volume growth (m<sup>3</sup>/ha/year) as follows:

**Volume growth → Biomass growth → Carbon growth → CO<sub>2</sub> growth (m<sup>3</sup>/ha/year) (tons of biomass/ha/yea) (tons of C/ha/year) (ton of CO<sub>2</sub>/ha/year)**

Application of 2006 IPCC guideline for measurement of the forest CO<sub>2</sub> absorption capacity (Annex 08) shows that:

One m<sup>3</sup> of the natural forest timber is able to absorb **1.48 (tCO<sub>2</sub>e)** and one m<sup>3</sup> of plantation forest is able to absorb **1.24 (tCO<sub>2</sub>e)**

The estimated forest carbon absorption capacity of Yen Bai as below:

By 2019, the forest area of the province was 433,586.2 ha, including 245,583 ha of natural forest; 188,002.4 ha of plantation forest; and 184,120.8 ha of natural forest as timber forest. According to the survey in Tram Tau Protection Forest Management Board in October 2020 and other areas, the average annual forest growth of the natural forest and the plantation forest were respectively 4.5 m<sup>3</sup>/ha/year and 15m<sup>3</sup>/ha/year.

Measurement of the carbon absorption capacity of the timber forest as natural forest: the majority of natural forest is the secondary forest with normal development if it is not negatively impacted by natural disaster, pests, deforestation, forest fire, etc. Total amount of the natural timber forest growth of the whole province (with the average annual growth of 4.5 m<sup>3</sup>/ha/year) is calculated as follows:

$$184,120.8 \text{ ha} \times 4.5 \text{ m}^3/\text{ha}/\text{year} = 828,543 \text{ m}^3/\text{year}.$$

1 m<sup>3</sup> of the natural forest timber absorbs: 1.48 tCO<sub>2</sub>

Total amount of CO<sub>2</sub> absorption of the natural timber forest is:

$$828,543 \text{ m}^3/\text{year} \times 1.48 \text{ tCO}_2 = \mathbf{1,226,244 \text{ tCO}_2/\text{year}}$$

The carbon absorption capacity of the plantation forest is:

$$188,002.4 \text{ ha} \times 15 \text{ m}^3/\text{ha}/\text{year} = 2,820,036 \text{ m}^3$$

$$2,820,036 \text{ m}^3 \times 1.24 \text{ tons of CO}_2 = \mathbf{3,496,844.64 \text{ tCO}_2/\text{year}}$$

*Total amount of CO<sub>2</sub> absorbed by the natural timber forest and the plantation forest in the whole province is: 1,226,244+3,496,844.64= 4,723,088.64tCO<sub>2</sub>/year. Additionally, other forest types such as the mixed forest, bamboo forest are also able to absorb carbon.*

b) Requirements of participation in the carbon credit trading in the world market

So far, there has been no international legal regulations on the forest carbon credit trading in general; however, some international carbon credit traders have given requirements for the sellers, which can be reflected as below:

- PPC has to develop the action plan on REDD+

The Prime Minister issued the Decision No. 419/QĐ-TTg dated on 5 April 2017 approving the national program on reduction of greenhouse gas emissions through the mitigation of deforestation and forest degradation, conservation and enhancement of forest carbon stocks and sustainable management of forest resources (REDD+) through 2030. The Decision specifies responsibilities of PPCs for disseminating information about REDD+ activities in their localities; adding REDD+ tasks to their existing provincial-level State Steering Committees for Forest Protection and Development; preparing provincial-level action plans for REDD+ to implement the REDD+ Program in their localities; and integrating provincial-level action plans for REDD+ with forest protection and development plans in their localities.

- Development of the emission baseline:

It means to develop the forest reference level – to be a benchmark for measuring the increased amount of carbon dioxide absorbed through forest conservation and development efforts (stipulated in clause 5, Article 3 of the Circular No. 33/2018/TT-BNNPTNT dated on 16 November 2018 of MARD prescribing forest survey, inventory and forest transition monitoring).

- Establishment of the measurement, reporting and verification (MRV) system:

It refers to organize a survey of biomass and carbon stock: reporting on biomass and carbon stock survey and assessment results; measuring the increased forest carbon stock over the

time. This content is prescribed in Article 22 of the Circular No. 33/2018/TT-BNNPTNT dated on 16 November 2018 of MARD

- Development of the plan on safety, the inverse risk management mechanism for emission reduction, the plan on benefit sharing from the carbon credit trading.

2.1.1.3. The estimated potential revenue of the forest carbon absorption and storage service

The potential revenue of the forest carbon absorption and storage service in Yen Bai can be generated from 2 sources:

a) Payment by the producers and traders causing massive greenhouse gas emission is in accordance with the regulations in the Law on Forestry and the Decree No.40 of the Government.

Yen Bai has 2 cement plants with the production output of 1.5 million tons of clinker per year. If the province applies the payment rate proposed to pilot in 4 provinces of Quang Ninh, Thanh Hoa, Quang Nam and Thua Thien Hue by MARD, the annual revenue shall be 3.15 billion.

$$1.5 \text{ million tons of clinker} \times 2100 \text{ dong/ton} = 3.15 \text{ billion dong/year}$$

b) Selling the carbon credit to the world market

Assuming that the entire natural forest area is well protected (no conversion of forest use purposes, no forest fire or pests, diseases, etc.), the annual amount of carbon absorbed by the natural timber forest is the increase amount of carbon eligible for the credit trading to the world market. The annual increase amount of carbon can be preliminarily measured on the basis of the annual growth of the forest.

Yen Bai can sell up to 70% of its annual increase amount of carbon (30% of its, equivalent to 1,416,926 tons of CO<sub>2</sub> is used for contingency) at the price of USD 5/ton (the same price of CO<sub>2</sub> that MARD sells to WB in the North-Central region). Thus, the annual revenue from carbon credit trading will be 383.26 billion dong.

$4,723,088.64 \text{ tCO}_2 \times \text{USD } 5 \times 70\% = \text{USD } 16.52 \text{ million}$ , equivalent to 383.26 billion dong per year (at the exchange rate: 1 USD = 23200 dong). This amount is 3 times higher than the total revenue from the hydropower plants, the clean water suppliers and the industrial production facilities in the province.

Carbon credit trading can be implemented for the large tree forest, because one of its requirements is that forest must be sustainably maintained for a long time (over 10 years), not be converted the forest use purposes or exploited during carbon credit trading period. Basically, the sustainable forest management will meet a number of requirements of the forest carbon credit trading.

In case that the province collects the forest carbon absorption and storage service charge from 2 cement plants, it is considered as the contribution of the FES users to support the forest protection and development in Vietnam but the carbon credit trading. Therefore, it is not required to measure and deduct the equivalent forest area in case of selling the carbon credit to the foreign countries to avoid of overlapping the forest area. Currently, as Vietnam has no legal document prescribing the emission quota for the industrial production facilities causing GHG emission, they are not required to buy the carbon credit (in case of exceeding the quota).

2.1.1.4. Proposed distribution of the revenue from the forest carbon absorption and storage service

In principle, distribution of this revenue shall be implemented in accordance with the Decree No.156 of the Government and the international practices (which are reflected in the contract of the carbon credit trading). As carbon is the intangible gasiform product, it is difficult to determine the direct payers; therefore, the payment should be entrusted to the VNFF.

The potential revenue from the carbon absorption and storage is 3.15 billion dong/year + 383.26 dong/year = 386.41 billion dong/year.

In terms of the revenue from the cement plants: as the direct receivers cannot be identified, after deducting 10% of management fee and 5% of contingency fund, the remaining amount of money will be used to support the mountainous districts, the special use and protection forests in the province. Most of these forests are located in remote areas with difficult or extremely difficult socio-economic conditions; areas where the majority of their population are ethnic minorities. Specifically:

- Supporting the areas with the lowest rate of FES charge per ha;
- Supporting protection and development of the protection and special use forests; plantation of trees in a scattered manner and forests for scenery purpose in the zone of forest environmental service provision.
- Disseminating policies on improvement of capacity to implement the policy on payment for forest environmental services in the province.
- Regarding the revenue from the carbon credit trading to the world market: after deducting 10% of management fee and 5% of contingency fund, the remaining amount of money will be paid to the forest owners who sell the carbon credit and related organizations, individual in line with requirements of the credit buyer.

#### 2.1.2. Proposed roadmap for deployment of the service iii

This is a potential forest environmental service which has not been specified under any legal documents. Thus, the province can prepare some following tasks after 2020:

##### 2.1.2.1. Development of the provincial Project of carbon credit trading to the world market

As there are no legal documents prescribing carbon credit trading to the world market, provisions under clause 3, Article 61 of the Law on Forestry and the Decision No. 1775/QĐ-TTg dated 21 November 2012 of the Prime Minister approving Project of greenhouse gas emission management; management of carbon credit business activities to the world market can be utilized to develop the provincial Project of carbon credit trading to the world market. To do that, the following activities should be done:

Reviewing and assessing the forest status in Yen Bai province, especially the natural forest;

- a) Assessing the capacity of the forest carbon absorption and storage of Yen Bai province;
- b) Determining scope, scale, types and status of forests; the forest owners able to sell the carbon credit to the world market;
- c) Developing the scenarios of the carbon credit trading to the world market and estimating the respective revenue;
- d) Preparing the solutions to support implementation of the Project (including safety measures; the inverse risk management mechanism for emission reduction, etc.)
- e) Evaluating the impacts of the carbon credit trading to the world market.

The province should collaborate with foreign investors, who wish to buy the carbon credit, to develop this Project.

##### 2.1.2.2. Preparation of procedures to submit Yen Bai PPC for consideration and response

The following documents should be prepared:

- Draft submission to PPC
- Draft Project of pilot carbon credit trading to the world market
- Aggregation of, explanation of and response to comments of the provincial related departments.

#### 2.1.2.3. Preparation of procedures to submit the Prime Minister for consideration and approval

- The following documents should be prepared:
- Draft Submission to the Prime Minister that allows Yen Bai to (i) develop and organize implementation of the pilot Project, (ii) directly sign the contract of carbon credit trading to the world market; (iii) distribute the revenue from carbon credit trading in accordance with the Decree 156 and international practices (requirements of the carbon credit buyers).
- The draft Project of pilot carbon credit trading to the world market
- Other related documents

#### 2.1.2.4. Organization of the pilot Project implementation

It is expected to submit the Project of pilot carbon credit trading to the world market to the Prime Minister for consideration and approval prior to 2023.

#### 2.1.2.5. Collection of the carbon absorption and storage service charge from 2 cement plants

MARD submitted to the Prime Minister the draft Decision on pilot PFES for the forest carbon absorption and storage service in 4 provinces of Quang Ninh, Thanh Hoa, Quang Nam and Thua Thien Hue but has not yet received the feedback. This pilot is only conducted when it is specified under the legal document.

### **2.2. Development of the expanded scenario for implementing the payment for services of i, ii, iv, v<sup>5</sup>**

#### 2.2.1. The hydropower plants (for the service i and ii<sup>6</sup>)

According to the review, besides 26 hydropower plants paying the FES charge (Table 02), there will be 26 projects of hydropower plant development in the coming time. This is a potential revenue from FES, in particular:

- 03 hydropower plants are expected to generate electricity in 2021 (Dong Sung, Thac Ca 1 and Thac Ca 2) with the installed capacity of 61.5 MW.
- 14 hydropower plants are expected to be completed in 2022 – 2023 with the installed capacity of 150.7 MW.
- 9 hydropower plants are expected to be completed in 2025 with the installed capacity of 114.7 MW.

**Thus, by 2025, the total capacity of the newly developed hydropower plants is 326.9 MW (Table 08).**

\* Additionally, from 2021 onwards, VNFF will regulate an additional budget from the hydropower projects of Minh Luong, Nam Xay Luong 3, Nam Xay Luong 4,5 in Lao Cai; Muong

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<sup>6</sup> Article 61, the Law on Forestry:

-Service i: Land protection, erosion and sedimentation limit of lakebeds, river beds and stream beds.

-Service ii: Regulating and maintaining water resources for production and social life.

Kim in Lai Chau; Nam Trai 4, Pa Chien in Son La for Yen Bai province. The Prime Minister approved the investment policy decision for expansion of Hoa Binh hydropower plant in 2018 (under the Decision No. 389/QD-TTg dated 11 April 2018). The expanded plant was commenced in Quarter IV of 2020 and is expected to operate in 2024 with the capacity of 480 MW. However, there are not data on the additional budget regulated for Yen Bai in 2021.

#### 2.2.2. The clean water supply facilities (for the service ii)

By 2020, 9 clean water supply facilities have been paying the FES charge. According to the review, no new facilities are developed in the coming time.

#### 2.2.3. The industrial production facilities using water from forest (for the service ii)

- By 2020, 23 industrial production facilities have been paying the FES charge. After reviewing, 48 additional industrial facilities using water from forest (Annex 7) are subject to PFES. Most of them are the mineral exploitation and processing enterprises that were operated before 01 January 2019 (the effective date of the Decree 156 to supplement the payers of FES as the industrial production facilities using water from reservoirs, rivers, streams and underground water for their production activities).

48 industrial production facilities will use an estimated amount of water of 9,885,189 m<sup>3</sup>/year.

#### 2.2.4. The aquaculture facilities (for the service v7)

By 2020, there have been no aquaculture facilities paying for FES. After reviewing, 06 aquaculture facilities (mainly farming salmon, sturgeon, and some freshwater fishes) are subject to PFES (Annex 10).

#### 2.2.5. Eco-tourism, recreation and entertainment service providers (type of service iv8)

a) Pursuant to the Law on Forestry (Article 77, 78), Decree 156 (Article 23, 24 and 25), organizations, individuals doing their business on eco-tourism, recreation and entertainment services (travel agents, tourist transport, tourist accommodation, catering services, entertainment, sight seeing etc.) within the forest area of forest owner is obligated to pay FES service charges. The forest management board can either self organize or seek a business partnership or lease out their forest environment in order to do their business on ecotourism, recreational and entertainment services. If the Management Board wishes to lease out forest environment, it shall have to develop a sustainable forest management plan (SFMP) and a ecotourism, recreational and entertainment scheme and submit them to the Provincial People's Committee for review and approval. Upon on the approval, forest owner shall collaborate with organizations and individuals to develop a investment project on ecotourism, recreational and entertainment services. The lease duration shall not exceed 30 years. The lease price is mutually agreed upon by the parties but not less than 1% of the total annual revenue of the lessee within the area permitted for lease

b) The survey findings shows that Yen Bai province has not had any organizations or individuals who are doing business on ecotourism within the forest area of the forest

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<sup>7</sup> Providing spawning grounds, food sources, natural breeding stock, water resources from forests and environmental elements and forest ecosystems for aquaculture.

<sup>8</sup> Service of natural landscape protection, biodiversity and forest ecosystem conservation for tourism business operation

management board or forestry companies; However, eco-tourism activities are being operated by households in the buffer zone, and utilizing forest landscape and forest environment services, specifically:

- In Mu Cang Chai district:

+ Mu Cang Chai PFMB: organizations and individuals are running their ecotourism business adjacent to the PFMB's forest (paragliding, catering, relaxing services in Khau Pha Pass ....). Aiming to have income from ecotourism services, under current situation, Mu Cang Chai PFMB can decide to lease out forest environment, because: (i) PFMB is a public non-business entity which has major mandates of forest management, protection and development; (ii) they have limited ability to invest in infrastructure for ecotourism business, no investment capital to provide tourism services; (iii) they have no experience in ecotourism service business ... Organizations and individuals can sign a lease contract with PFMB in order to run their ecotourism, recreation and entertainment business after the proposal on ecotourism, recreation and entertainment is approved.

As stipulated by prevailing laws, forest owners are only permitted to sign contracts with organizations and individuals that lease the forest environment for ecotourism, recreation and entertainment business. Specific ecotourism activities are prescribed in the Law on Tourism. However, ecotourism business activities herein are typical because it is related to the use of protection forest land, lawful provisions in the case of forest environment lease can be specifically comply with as follows:

- in case where infrastructural works are constructed for the purpose of ecotourism, recreational and entertainment business, certain rules shall be followed such as non-destroy of environmental landscape, zero deforestation or constructional structures only on bare land, grassland, or shrubland which cannot be self-restored ect.

- Agro-forest production is not carried out in watershed protection forests with a slope of over 300. Under the mature protection forest canopy, intercropping with cash crops, non-timber forest products, animal husbandry and aquaculture are permitted. However, it is not allowed to reduce the forest area and its protection functions, ensuring at least 80% of the forested area of the watershed protection forest plot

Tourism travel agents in Cao Pha and Mu Cang Chai are being operated by households who registered their business on catering and homestay services within the two districts just adjacent to Cao Pha Pass. They have not yet organized sightseeing tours. Such households wish to rent more than 20 hectares of forest from the Mu Cang Chai PFMB adjacent to the place of paragliding take-off (Highway 32, Cao Pha Pass) for the purpose of community tourism development. It is planned to construct the road from Khau Pha (paragliding take-off place) to Ta sung - Lap Mong - Lam Thai hamlets. This road will go through Mu Cang Chai PFMB's land area (bare land shall be utilized for road construction), helping visitors to have great view of terraced rice fields in Tu Le district. Flowers (rose, buckwheat flowers) and fruit trees will be planted on bare land areas. Recreational and entertainment services, including paragliding introduction campaigns, watch towers are to be launched. 2 months of tourism can be organized during a year. These tourism activities are permitted in accordance with the



legal provisions on protection forest land use as above-mentioned. However, before signing a forest environment lease contract, the forest owner must conduct a forest resource inventory on the leased land as a basis for lease and for monitoring and evaluation of the contract performance.

+ Mu Cang Chai habitat reserve is located in Che Tao commune and 4 other communes with an area of 20,108.2 ha. The Reserve's core area is 15 km bird-flight and 35 km car drive away from the center of Mu Cang Chai district. The latest report recognized 812 flora species from 518 genera and 142 families of 5 high vascular flora species. Of which, 48 species are listed in Vietnam's Red Book. The Reserve's fauna is also very rich and highly endemic. The latest inventory shows that that Reserve has 241 species, 74 families, and 24 sets of vertebrate animals, including 54 species of mammals, 132 species of birds, 26 species of reptiles, 26 species of amphibians, 42 species of rare and precious to Vietnam and 28 globally threatened species. Of

which, four species of animals that need to be highly protected include Rufous-necked hornbill (*Aceros nipalensis*); Siamese fireback (*Tragopan temminckii*), Black Crested Gibbon (*Nomascus concolor*) and Phayre's leaf monkey (*Trachypithecus phayrei*). Four flora species *Calocedrus macrolepis*, *Alseodaphne hainanensis*, *Schefflera palmiformis*; and *Phoebe poilanei* also need to be highly protected. 423 Mong ethnic minority households are living in the National Reserve. On March 27, 2020, the People's Committee of Yen Bai province issued Official Letter No. 698/QBND-NLN on researching and proposing to develop a scheme for a World Biosphere Reserve in Mu Cang Chai habitat reserve. If it is recognized as a World Biosphere Reserve, it will attract more domestic and foreign tourists.

+ Mu Cang Chai habitat reserve has a potential to develop types of experimental tourism (adventure tourism) and community ecotourism because the Reserve has many beautiful natural landscapes and many ethnic minority communities.

+ Na Hao Nature Reserve's location covers 4 communes including Na Hao, Mo Vang, Dai Son and Phong Du Thuong of Van Yen district on a total planned area of 16,039 ha, including 7,250 hectare of highly-protected forest stand, 8,790 ha of ecologically rehabilitable stand. At present, 93 households are living and cultivating in the core of the strictly protected area. The Reserve has many rare and precious flora species such as *Dicksoniaceae*, *Cibotium barometz*, *Terminalia myriocarpa* and fauna species such as Leopard (*Panthera pardus*), Asian Golden Cat (*Catopuma temminckii*), Indochinese rhesus macaque (*Macaca mulatta*), Bald uakari (*Cacajao calvus*), Silver pheasant (*Lophura nycthemera*) and *Arborophila chloropus*

This Reserve has a potential to develop types of experimental tourism (adventure tourism) and community ecotourism

+ Tram Tau PFMB was established in 2006 with the key mandates of forest management, protection and development, especially protection forests. Total forest area managed by Tram Ta PFMB is 35,441,18 ha, including 27,622.93 ha of protection forest and 7,818.25ha of production forest. This area has the advantage of hydropower project development. However, the development of adventurous tours (mountain trekking), sightseeing tours and community based tours is potential in Ta Su village of Ban Cau commune of Tram Tau district

10 km away from the center of Tram Tau district where the pathway to the foot of Ta Sua Mountain was opened. This tourist attraction was included in the ecotourism development program of Tram

Yen Bai province has great potential for ecotourism development. Firstly the province can develop type of adventure tourism, community-based tourism, recreation and entertainment services; forest owners can use lease out forest environment to do business on eco-tourism, recreation and entertainment.

**2.3. Development of PFES payment scheme for FES services i, ii, iv and v**

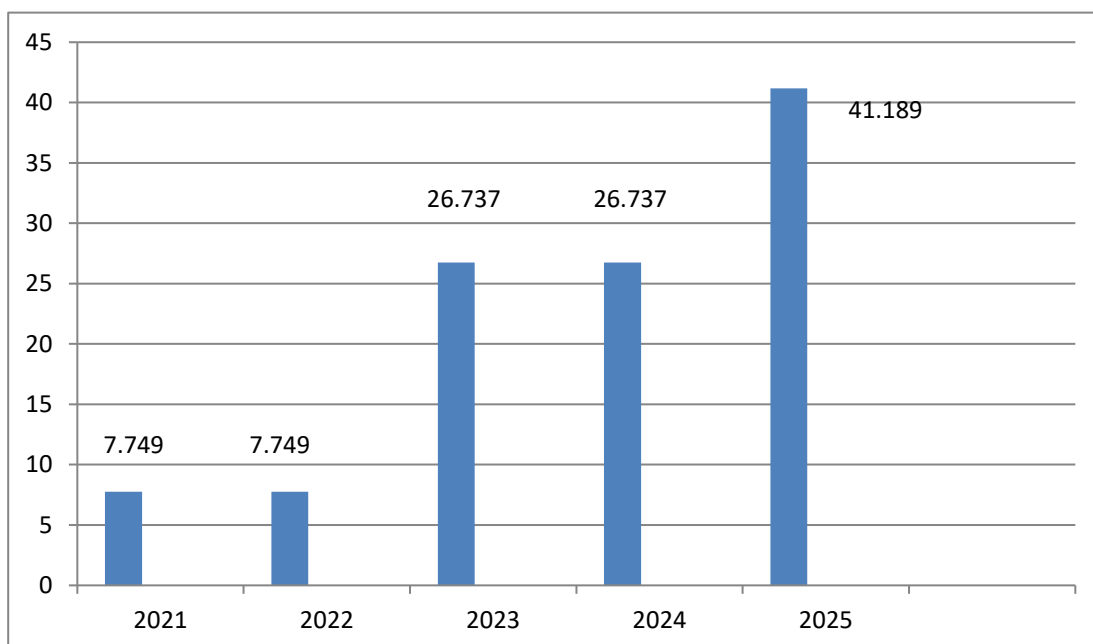
**2.3.1. Expected PFES revenue and distribution from service (i) and (ii) (see Annex 10)**

**a) Expected PFES revenue from hydropower plants in 2025**

it is assumed that the annual electricity output does not fluctuate and the service charge rate is 36vnd/kwh commercial electricity (Clause 1, Article 56 of Decree 156/ND-CP dated 16 November, 2018). The calculation method and and evaluation findings of the PFES collection from 26 hydropower plants between 2017 and 2019 shows that each hydropower plant can generate on average 3,500 hours/1MW/year, equivalent to KW = 326,9MW x 1000 = 326,900 kw

The total of amount which is expected to be additionally collected in 2025 is 326,900 kw x 3,500 hours/year x 36đ/kwh = VND41,189 billion/year (round figure) compared to 2020

Similar to other years, this figure is estimated to be an additional VND7,749 billion, VND7,749 billion, VND7,749 billion, VND26,737 billion and VND26,737 billion in 2021, 2022, 2023 and 2024 respectively.



**Figure 8: Expected additional PFES amount collected from hydropower plants compared with the year 2020 (billion VND)**

**b) Distribution of expected PFES amount collected from hydropower plants**

In the principle, the distribution of this amount shall be in accordance with the Article 70 of the Decree 165 by the Government, which is applicable to the method of entrusted payment through FPDF. The total additional amount after being deducted 10% of the total amount of entrustment for management fee and 5% as a provision for provincial-level FPDF shall be merged into the total amount received from hydropower plants which is to be paid for FES providers corresponding to the calculated forest area eligible for PFES

Thus, PFES revenue from hydropower plants is expected to increase on annual basis from the year 2020 onwards thanks to a number of additional hydropower plants will come into operation and has their electricity output to be sold to EVN. By 2025, the additional PFES amount from hydropower plants is expected to be VND41,189 billion/year.

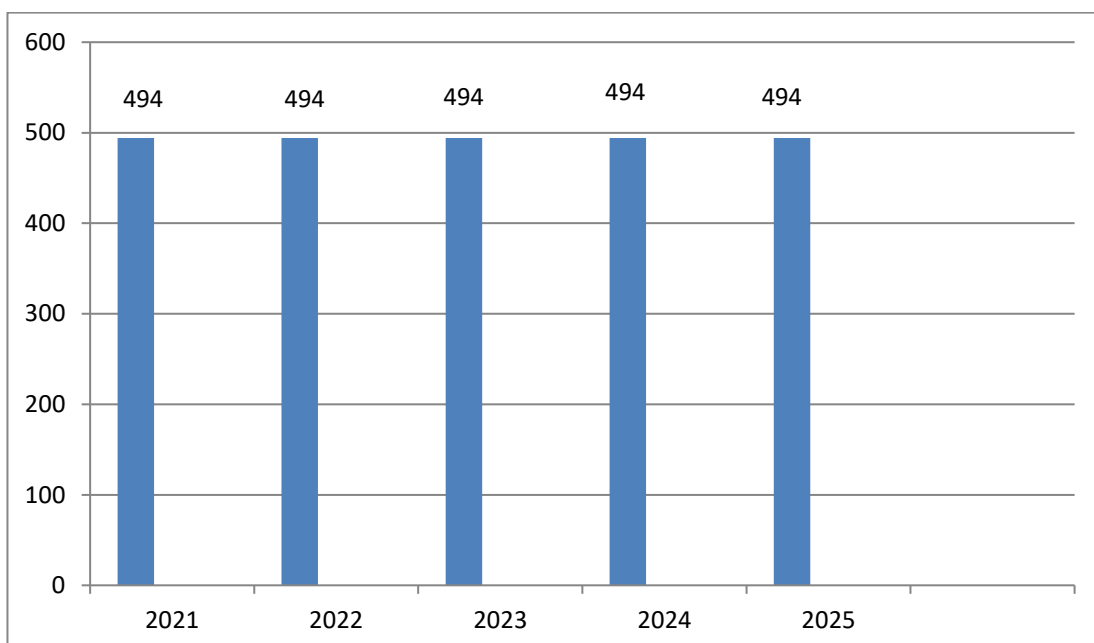
### 2.3.2. Development of PFES payment scheme for service (ii)

#### a) Expected PFES revenue from industrial facilities after 2020

As prescribed by Article 59 of the Decree 156/2018/ND-CP, water volume used for calculation of forest environmental service charges is the volume of water used by the industrial producer measured by the water meter or volume of water permitted for use by a competent authority or the one specified under sale document between the industrial producer and water trader

it is assumed that the volume of water used does not change on annual basis, the service charge rate is as prescribed in Article 59 of the Decree 156. The PFES amount received from industrial facilities is VND494,259 million/year (494 million dong)

$$9.885.189 \text{ m}^3/\text{year} \times 50\text{đ}/\text{m}^3 = 494.259 \text{ million/year}$$



**Figure 9. : Expected additional PFES amount collected from industrial facilities compared with the year 2020 (million VND)**

As stipulated by the Decree 156, PFES amount must have been collected from industrial facilities using water resource since 1 January 2019. In the principle, all 48 industrial facilities shall have to pay FES service charge from 1 January 2019. However, it is possible to consider

the proposal to start collecting this service charge from 2021 because (i) average annual FES amount paid by industrial facilities is relatively small (on average 10.2 million VND/facility/year), (ii) FES money is an element of the production cost of the production year, the retroactive payment might cause troubles to industrial facilities (iii) This is a new target group of FES payers, it is difficult to review and identify whether industrial facilities are using water resource from forests or not, then it takes a lot of time to identify and make a list of industrial facilities. This means more time is needed for preparation. Therefore, it is reasonable to start to collect FES service charge for this type of service from 2021 onwards.

b) Distribution of expected PFES amount collected from industrial facilities

The distribution of this amount is stipulated in the Decree 156/2018/ND-CP (Article 69,70). FES service users shall transfer money to the forest protection and development funds (only entrusted payment is applicable). The additional amount received shall be merged into the total amount collected from industrial facilities. After deducting maximum 10% for the FPDF's overhead costs and 5% as a provision for the provincial-level FPDF, FPDF will distribute the remaining amount for FES service providers corresponding to the calculated forest area eligible for PFES.

With regard to the forest environmental service charge paid industrial facilities whose receiver either has not yet or cannot be identified, Yen Bai FPDF shall have to submit a proposal to Provincial People's Committee to distribute this amount to mountainous districts, special-use and protection forest areas within the province, specifically order to:

- Support to the service providers having the minimum average rate for service charge per hectare;
- Support in forest protection and development (protection and special-use forests), disperse plantation, afforestation for landscape development in the PFES eligible forest area
- Support in PFES policy dissemination and capacity building for PFES policy enforcement

2.3.3. Development of PFES payment scheme for service (v)

a) Expected additional PFES revenue from aquaculture facilities

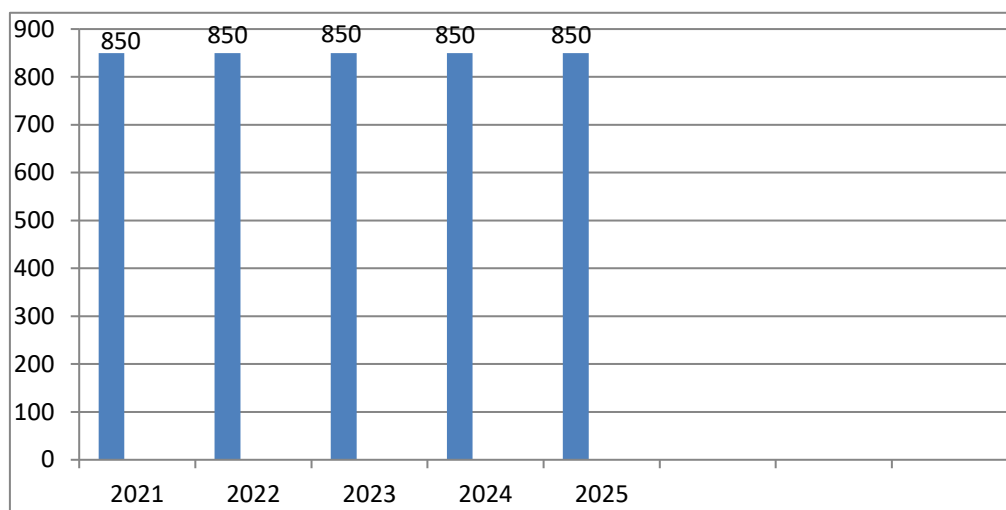
The survey findings indicated that 6 aquaculture facilities (mainly salmon, sturgeon and some other kinds of freshwater fishes) shall have to pay forest environmental service charges (see Diagram 9). The total revenue of such 6 aquaculture facilities is VND85 billion billion/year

The total annual PFES payables is VND85 billion x 1%= VND0.85 billion; on average each aquaculture facility shall have to pay VND141.6 million/year (0.85 billion:6) = 141.6 million dong/1 facility/year). However, this service charge is not stable because: (i) For cold water fish farming, due to climate change leading to increased temperature, very low volume of water sources in the dry season months and disease outbreak, commercial fish production is significantly affected, even entirely lost; (ii) For freshwater fish farming on Thac Ba Lake, the commercial fish production is better, but in the rainy season, it is also significantly affected by diseases.

b) Distribution of expected PFES amount collected from aquaculture facilities

The PFES amount can be distributed in 2 ways:

- Direct payment: aquaculture facilities shall sign direct contracts with the Forest Management Board who is the forest owner of PFES eligible forest areas. The direct payment method is adopted when both FES service providers and users are able to identify the origins of water resources from the forest area of 01 Forest Management Board,



**Figure 10: Expected additional PFES amount from aquaculture facilities compared to 2020 (million VND)**

and there exist no disputes between neighboring forest owners and forest management board. The PFES amount received by the Forest Management Board shall be merged into the total revenue of the Forest Management Board to use for the course of forest management, protection and development in accordance with the Decree 141/2016/ND-CP, dated 10 /10/2016 by the Government regulating on the autonomy mechanism of non-business public agencies in the economic sector and others

- Indirect payment: aquaculture facilities shall make entrusted payment through FPDF. This indirect payment is applied in case where PFES receivers are impossible to be defined or in case where aquaculture facility and forest owner user fail to mutually enter into a contract for direct payment of forest environmental services. The FPDF shall submit proposals to the provincial People's Committee for approving the distribution of such charge either to the service providers having the minimum average rate for service charge per hectare; or to the support in forest protection and development, disperse plantation, PFES policy dissemination and capacity building for PFES policy enforcement.

Majority of such aquaculture facilities have been running their business since 2018 – 2019. In the principle, such facilities shall have to pay FES service charge since 1 January, 2019 (the effective date of the Decree 156)

The following solutions are proposed:

- Option 1: FPDF is proposed to directly work with aquaculture facilities who must have paid FES service charges as prescribed by the Decision 1566/QD-UBND dated 21 August 2019 by

Yen Bai PPC. As stipulated by Clause 2 of Article 58 of the Decree 156, the user of forest environmental services shall make payment to the provider by transferring the service charge to the forest protection and development fund in case the service provider and user fail to mutually enter into a contract for direct payment of forest environmental services. PFES payment amount shall be calculated based on their annual revenues (2019, 2020) which is served as basis for tax payment to the provincial tax bureau. The PFES payment rate is 1% of the revenue of the year. In case where aquaculture facility is entitled to an exemption, it shall comply with the Clause 5 (PFES remission, exemption) of the Decree 156. The retroactive payment needs to be considered based on actual conditions, not causing negative effects to their business operation

- Option 2: submit a proposal Yen Bai PPC for approval on starting to collect FES service charge from 6 aquaculture facilities from 2021.

**2.4. Total of potential PFES revenues between 2021 and 2025 and impacts of such revenues**

- Hydropower plant: VND110.161 billion;
- Industrial facilities: VND2.470 billion;
- Aquaculture facilities: VND4.250 billion.

(See Annex 11 for more details)

However, starting from 2021, FES service charges can be additionally collected from some hydro power plants, industrial facilities, aquaculture facilities. By 2025, the total PFES additional amount is expected to be VND116.881 billion.

**Table 6: Summary of potential PFES revenue and its distribution**

<b>TT</b>	<b>Expected FES service charges</b>	<b>Estimated PFES amount</b>
<b>I</b>	<b>Potential service charges to be additionally collected by 2025</b>	<b>VND116.881 billion</b>
1	Hydro power plants: VND110.161 billion	The additional amount to be collected per year 2021: VND7.749 billion 2022: VND 7.749 billion 2023: VND 26.37 billion 2024: VND 26.737 billion 2025: VND 41.189 billion The total additional amount expected between 2021 and 2025: VND110.161 billion
2	Industrial facilities	The additional amount to be collected per year: 2021: VND494 million 2022: VND 494 million 2023: VND 494 million 2024: VND 494 million 2025: VND 494 million

		The total additional amount expected between 2021 and 2025: VND2,470 million
3	Aquaculture facilities: VND4,250 million	The additional amount to be collected per year: 2021: VND850 million 2022: 850 million 2023: 850 million 2024: 850 million 2025: 850 million  The total additional amount expected between 2021 and 2025: 4,250 billion
4	Proposed distribution of additional FES service charges collected between 2021 and 2025	
	a) Hydro power plants: VND110. 161 billion	As prescribed in the Decree 156 (Article 69, 70), After deducting payables (10% for management fee and 5% as a provision for FPDF), FPDF shall pay FES providers corresponding to the calculated forest area eligible for PFES. Organizations being state-owned entities are permitted to use the amount for paying households, individuals, local communities for the contracted forest protection service as well as cover the costs of their own forest protection activities In case where FES service charges are collected from industrial facilities but PFES receivers have not yet identified, FPDF shall have to submit a proposal to Provincial People’s Committee to distribute this amount to mountainous districts, special-use and protection forest areas within the province, specifically order to: - Support to the service providers having the minimum average rate for service charge per hectare; - Support in forest protection and development (protection and special-use forests), disperse plantation, afforestation for landscape development in the PFES eligible forest area - Support in PFES policy dissemination and capacity building for PFES policy enforcement
	b) Industrial facilities: VND2,470 million	
	c) Aquaculture facilities: VND4,250 billion	This amount is suggested to be distributed in 2 ways: - Direct payment: aquaculture facilities shall directly sign contracts with the Forest Management Board who is a forest owner of PFES eligible forest areas, the amount collected shall be merged into the FPDF’s total revenue to use for their forest management, protection and development in accordance with laws; - indirect payment: aquaculture facilities shall make entrusted payment through FPDF. The FPDF shall

		submit proposals to the provincial People’s Committee for approving the distribution of such charge either to the service providers having the minimum average rate for service charge per hectare; or to the support in forest protection and development, disperse plantation, PFES policy dissemination and capacity building for PFES policy enforcement.
<b>II</b>	<b>Proposed distribution of potential FES service charges</b>	
a	FES charges on carbon sequestration and retention paid by production and business entities that cause high GHG emission	<p>Charges on carbon sequestration and retention services paid by 2 cement factories  1.5 million ton clinker x 21,00vnd/ton clinker = 3.15 billion vnd/year</p> <p>Since PFES receivers have not yet been identified, the remaining PFES amount after deducted 10% for management fee and 5% as a provision to FPDF (contingency) will distributed to mountainous districts, special-use and protection forests within the province, specifically:</p> <ul style="list-style-type: none"> <li>- Support to the service providers having the minimum average rate for service charge per hectare;</li> <li>- Support in forest protection and development (protection and special-use forests), disperse plantation, afforestation for landscape development in the PFES eligible forest area</li> <li>- Support in PFES policy dissemination and capacity building for PFES policy enforcement</li> </ul>
b	Carbon credit trading in international markets	<p>It is assumed that 70% of carbon is sequestered by natural forests is to be sold abroad: 4,723,088.64tCO2 x USD x70% =16.52 million USD; equivalent to VND383.26 billion/year (exchange rate: US\$1=VND23,200), which triples the aggregated amount collected from hydropower plants, clean water suppliers and industrial facilities</p> <p>In case where carbon credits from plantations, the PFES revenue shall be higher</p> <p>This amount after deducted 10% for management fee and 5% as a provision to FPDF shall be distributed to forest owners who sell their carbon stocks and organizations, individuals who meet requirements from carbon credit buyers</p>
c	Lease out forest environment for eco-tourism, recreation and entertainment business operations	<p>This service charge can be paid in 2 ways: eco-tourism, recreational and entertainment entities can directly sign contract with the Forest Management Board being forest owner of PFES eligible forest area. The amount that the Forest Management Board receives shall be merged into the total revenue of the Forest Management Board to use for their forest</p>



		management, protection and development in accordance with legal provisions on use of finance beyond the State Budget
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## 2.5. Assessment of impacts from potential forest environmental service charges

### a) Economic impacts

Between 2021 and 2025, the forest environmental service charges which are expected to be additionally collected is VND116.881 billion. The remaining amount after deducted management fee (10%) and provision to FPDF as contingency (5%) shall be distributed to forest owners. This considerable additional financing is expected to support forest management boards, forestry companies, forest owners being households, individuals in their forest management and protection under the context where the State Budget for natural forest protection remains very limited, especially in remote, mountainous and ethnic minority areas within the province. Furthermore, FPDF has an additional financing source to cover their overhead costs as well as further financial support to households, individuals and local communities whose forest areas are allocated for contracted protection in case of natural disasters, droughts or those who receive low PFES amount.

### b) Social impacts

- The additional PFES amount between 2021 and 2025 after deducted for management fee and for provision as a contingency to FPDF shall be used for expanding the forest area to be allocated for forest management and protection in the province. With the average payment rate of VND677,000/ha/year, in case where each household have about 15 hectares contacted for forest protection on average, employment will be created for nearly 10,000 households, contributing to improve their incomes. Some households shall use this money for investing in agricultural production, raising and schooling children, stable livelihoods and living standard improvement, especially in mountainous, remote and ethnic minority areas. Since local people are entitled to enjoy benefits from PFES, they are aware of their responsibilities for better forest protection and forest ecosystem conservation, which helps to reduce the case of illegal actions against the Law on Forestry.

### c) Environmental impacts

The additional PFES amount paid for forest management and protection contributes to maintenance and development of existing forest areas and supplementary plantation, contributing to strengthen the protection functions and ecological environmental conservation of forests

## CONCLUSION AND RECOMMENDATION

### I. CONCLUSION

1. Yen Bai province has great potential development of forest environmental services. In a short-term, the province is proposed to review and make a list of additional hydropower plants, industrial facilities and aquaculture facilities using water resources from forests who shall have to pay FES charges after 2020. In the principle, the PFES amount shall be distributed

as regulated in Article 69, 70 of the Decree 156 and in accordance with current situation of Yen Bai province. The additional PFES amount shall contribute to increase the revenue of forest owners being forest management boards, forestry companies; households, individuals in order to invest in forest management and protection; to expand the forest areas to be allocated local people for contracted forest protection; to create employment; to increase income for nearly 10,000 households

2. Yen Bai province has 433,586.2 ha forest, including 245,583.82 ha natural forests; 188,002.4 plantations. This is a great potential for carbon credit trading in international markets (formal carbon market or voluntary carbon market), especially in case of natural forests and large timber forests. Paris Agreement on Climate Change which replaces the Kyoto Protocol in 2020 has encouraged countries joining carbon credit trading activities. This is a chance to attract foreign investors to buy credit stock of Yen Bai province.

3. Yen Bai province has big potential for eco-tourism. However, due to limited eco-tourism infrastructure and some other reasons, so far the province has not yet had any organizations, individuals who are operating their eco-tourism business in the forest areas managed by Forest Management Board or forestry companies eco-tourism operations has been taking place in the buffer zone of the forests, adjacent to forest areas managed by forest management boards and using forest landscapes and forest environmental services generated by forests. Thus, it is proposed to collect forest environmental services charged on eco-tourism operation mainly through the method of forest environment lease-out. Aiming to do this, the Forest Management Board is required to develop a sustainable forest management plan (SFSM) and a business plan on eco-tourism, recreation and entertainment services which are to be submitted to PPC for review and approval. Based on these, forest owner in collaboration with organization, individual develop an investment project for eco-tourism, recreation and entertainment services by leasing out forest environment within their forest area as managed

## **II. RECOMMENDATION**

### **1. For FPDF**

After the Workshop “*Study on the development of potential forest environmental services in Yen Bai province*” dated 19 November 2020, FPDF is proposed to follow up:

- Continue working with industrial facilities and aquaculture establishments in the province to review and make the list of additional FES service payers in 2021 as stipulated by prevailing laws; directly work with FES payers to agree upon on the starting time of collecting FES service charges and upon on PFES calculation methods (industrial facilities, aquaculture facilities); provide answers to questions by service users; submit the question to DARD and PPC for guidance in case of beyond their competence (written official letter); ensure that service users are willing to pay forest environmental service charges
- Completely settle down with aquacultural establishments who must have paid FES service charges as stipulated by the Decision 1566/QĐ-UBND dated 21 August, 2019 by Yen Bai PPC. PFES payment amount shall be calculated based on their annual revenues which is served as

basis for tax payment to the provincial tax bureau. In case where aquaculture facility is entitled to an exemption, it shall comply with the Clause 5 (PFES remission, exemption) of the Decree 156. The retroactive payment needs to be considered based on actual conditions, not causing negative effects to their business operation. Or it is advised to submit a proposal requesting to start collecting PFES in 2021

- Propose solutions to resolve with some FES payers who are still in debt (total debt is VND2.686 billion). FPDF shall report competent agencies to collect PFES money from those who are in debt. In case where those who are in debt are entitled to a remission or exemption from PFES as regulated by Clause 5 (PFES remission, exemption) of the Decree 156, they are requested to prepare a profile and submit a request for remission, exemption to competent agencies for decision as prescribed in Article 75 of Decree 156
- Act as a focal point between FES service users and providers in case of direct payment form.
- Finalize and submit reports to DARD on the list of additional PFES payers starting from 2021, and then submit them to PPC for approval (enclosed with the PFES distribution scheme)
- Entrusted payment is made by aquaculture facilities in case where FES service providers and users fail to agree on PFES contract or where PFES receivers cannot or difficult to be identified
- Seek partners to support in research and development of Yen Bai province's proposal on pilot carbon credit trading in international markets, then submit the proposal to DARD, PPC for review and to the Prime Minister for appraisal and approval, which is served as a basis for attracting foreign investors in forest carbon credit trading. The following activities are proposed:
  - + Review, assess the current status of forest resources in Yen Bai province
  - + Assess the carbon sequestration and retention of Yen Bai forests
  - + Identify location, size, type and status of forests, potential carbon sellers
  - + Develop scenarios for carbon credit trading abroad and estimation of carbon stock
  - + Solutions to support in implementing the Proposal (safeguard measures, management of risks of inverse carbon emission reduction etc.)
  - + Assess expected impacts from carbon credit trading abroad

## **2. For DARD**

- DARD is proposed to steer Sub-Department of Forest Protection, Forest Protection and Development Fund (FPDF) in collaboration with other relevant agencies to develop a proposal on pilot carbon credit trading in international markets and prepare necessary documents to be submitted to all levels of competent agencies, consisting of DARD, PPC, and to the Prime Minister for consideration and approval.

In case where foreign investors wish to buy credit stock, they are encouraged to work together to jointly develop the proposal

## **3. Distribution of PFES amount collected from industrial facilities, aquaculture facilities**

Apart from the distribution payment scheme proposed for some activities as specified herein, this amount is permitted to use for subsidizing the plantation of protection, special-use forests./.

