MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT

MINISTRY OF EDUCATION AND TRAINING

VIETNAM NATIONAL UNIVERSITY OF FORESTRY

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RESEARCH TO ESTABLISH A MONITORING AND EVALUATION SYSTEM FOR THE PAMENT OF FOREST ENVIRONMENTAL SERVICES IN VIETNAM

Major in: Forest Resources Management

Code: 9620211

FORESTRY DOCTORAL DISSERTATION SUMMARY

HÀ NỘI - 2020

The Dissertation is accomplished at: **Vietnam National University of Forestry**

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Reviewer 1: .....

Reviewer 2: .....

Reviewer 3: .....

The dissertation will be defensed before
the University Assessment Board at:
Vietnam National University of Forestry
on ……/……/2020

The dissertation might be found at:

- The Library of Vietnam National University of Forestry
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LIST OF ARTICLES
AND PUBLISHED SCIENTIFIC WORKS

1. Nguyễn Khắc Lâm, Vương Văn Quỳnh, Lã Nguyên Khang, Lê Sỹ Doanh (2019), *Proposing a set of indicators for monitoring and evaluation of payment for forest environmental services in Vietnam*, Journal of Science and Technology of Agriculture and Rural Development, No. 14/2019, Ministry of Agriculture and Rural Development, Hanoi, Pg. 63-74;

2. Nguyễn Khắc Lâm, Vương Văn Quỳnh, Nguyễn Hải Hòa, Lê Sỹ Doanh (2020), *Application of information technology in Monitoring and Evaluation of Payment for Forest Environmental Services in Nghe An province*, Journal of Forestry Science and Technology, No. 2/2020, Vietnam National University of Forestry, Hanoi, Pg. 58-67;

3. Nguyễn Khắc Lâm, Vương Văn Quỳnh, Nguyễn Hải Hòa (2020), *Proposing the application of multi-criteria analysis method in selecting and completing the model of Monitoring and Evaluation for Payment for Forest Environment Services, Journal of Forestry Science and Technology, No. 4/2020, Vietnam National University of Forestry, Hanoi, Pg. 108-117*.

PREFACE

1. The necessity of the research

The PFES policy has been achieving undeniable results, but there are still some shortcomings. Many studies have shown that the lack of an effective Monitoring and Evaluation (M&E) system is a major negative point, which can lead to risks and adversely affect the performance of this policy in the long term. Up to now, there have been a number of studies to develop M&E indicators for PFES, supported by VNFF and other organizations such as ADB, FORLAND, PanNature, and CIFOR. However, the current sets of indicators still has some limitations, there is no complete M&E system approved and applied for PFES in Vietnam. Given the situation, this thesis has analyzed the PFES in policy and practice in Vietnam (VN). Then, the thesis chooses appropriate standards, criteria for M&E and to propose a set of M&E indicators for PFES. The thesis also determines weight for M&E criteria, build an operational process and integrate the software into the PFES M&E system.

2. Objectives of the research

2.1 Overall Objective

The dissertation contributes to strengthening the theoretical and practical basis of the M&E of Forest Environmental Services Payment in Vietnam to ensure equity, transparency and efficiency.

2.2 Specific Objectives

Research the PFES policy and current situation of PFES implementation in VN to clarify the rationale and requirements of the M&E; developing indicators to ensure evaluation of the equity, transparency and efficiency of the policy; proposing technical tools and processes to effectively operate the M&E system of PFES in VN.

3. Object and scope of the study

3.1 Object of the study

The main research object is the regulations, requirements, practice of M&E of PFES; the organization and operation of the FPDF is associated with the M&E activities of PFES.

3.2. The scope of the study

Researching domestic and international PFES documents, analyzing the current situation of PFES in VN; pilot running PFES M&E system in Nghe An province.

4. New contributions of the thesis

The thesis contributes to the formation of view and methodology on M&E for PFES; guides methods for selecting indicators and calculating weight of M&E criteria; sets up tools and procedures, integrates online software to support PFES M&E.

5. The scientific and practical significance of the thesis

5.1 Scientific significance

The thesis is a thorough research on PFES and PFES M&E, contributing to clarify the theoretical basis, practice and method of developing a PFES M&E system. The thesis builds a scientific basis for the selecting M&E indicators, weighted analysis for the M&E criteria.

5.2 Practical significance

The thesis has built up a set of criteria and indicators for M&E linking the reality of PFES in VN; This might be reference document for FPDF and relevant agencies on PFES and PFES M&E. The thesis has also built online software, which helps to make M&E of PFES public, convenient and accessible to all interested parties.

CHAPTER 1: OVERVIEW OF RESEARCH TOPIC

1.1 Study Internationally

1.1.1 Study on M&E

1.1.1.1 Concept and relationship between monitoring and evaluation

It can be generalized that M&E is an integral component in any policy implementation process, a management tool that helps to regularly collect information, monitor activities to review compliance with regulations, and follow up the plan, the direction and the ability to achieve the goal.

Studies show that monitoring and evaluation are two different concepts but are two parallel processes, not separate in a unified system. PFES necessarily has M&E activities conducted in parallel and it is necessary to develop a M&E system in a unified system.

1.1.1.2 The development of M&E through periods

The history of assessment has been basically developed through four stages. The methods, techniques and approaches of later stage monitoring were developed and expanded on the basis of inheriting the results of the previous period. The PFES monitoring system in VN needs to inherit the principles of participation, result-based M&E.

1.1.2 Study on PFES and PFES M&E

1.1.2.1 On PFES

A number of countries have had certain success in implementing PFES, but all face challenges such as: (i) difficulties in M&E; (ii) limited contribution to poverty reduction; (iii) The participation of the private sector is not much; (iv) Regulations and guidelines are limited.

1.1.2.2 On PFES M&E

In developed countries, M&E is a must when implementing policies, including PFES. Therefore, few studies have focused on M&E for PFES. Nevertheless, M&E is always recommended as an indispensable component when designing and implementing policies.

1.2 Study in Vietnam

1.2.1 Study on M&E

The research and application of M&E is still limited, and theoretical inconsistency. In terms of structure, the current M&E indicator sets may have 2 levels: Criteria, Indicators or 3 levels: Standards, Criteria, Indicators. The thesis recommends indicators for PFES M&E is designed according to 3 levels: Standards, Criterias, and Indicators. On assessment scale, many organizations apply 5 rating levels (very good, good, average, poor, very poor) with max point of 100, 10 or 5. Given the scale and nature of the M&E for PFES, using a 5-point max scale is appropriate. In terms of the principle of selecting monitoring indicators, the OECD SMART principles are optimal and recommended for application.

1.2.2 Study on PFES and PFES M&E

1.2.2.1 PFES policy in Vietnam

The basic concept of PFES was first detailed in Decree 99/2010/ND-CP, including the concepts of: Forest environment, Forest environment use value, FES, FES supply and use, PFES method, PFES rate. This is the legal basis for the organization of M&E of PFES.

1.2.2.2 Studies on PFES and PFES M&E

Researches over the past time all have the same perception on the success of PFES. In addition, studies also point out limitations on M&E. From 2015 up to now, there have been a number of in-depth studies analyzing the current situation, shortcomings and proposing a number of monitoring solutions for PFES in VN.

1.3 Assessment summary of studies on PFES M&E

In many countries, M&E is mandatory when implementing policies,

including PFES. M&E is established throughout the preparation, planning and implementation phases of policies. In terms of approach, M&E around the world has evolved from a simple to a logical framework (LFA) approach, to a participatory approach (PA) and a results-based approach (RB). The M&E for PFES in Vietnam can selectively inherit international experiences and adjust to suit the domestic context.

CHAPTER 2: CONTENTS AND METHODOLOGY

2.1 Research content

2.1.1 Research on PFES policy and its current situation

Review and analyze regulations, requirements and conditions for implementation of the policy; Evaluate the results of the implementation of the policy and analyze the gaps between the policy and the reality of PFES to guide the requirements set out for the PFES assessment.

2.1.2 Research on the theory and practice of PFES M&E

Analysis of theoretical basis; clarifying the practice of M&E for PFES; to propose the structure of the M&E system of PFES.

2.1.3 Research to propose a set of indicators for PFES M&E

Identifing the M&E standards and criteria; Selection of monitoring indicators; Weighting standards and criteria; Proposing evaluation and scoring method for M&E of PFES.

2.1.4 Researching tools to support PFES M&E

Building data collection forms; Development of online and field monitoring software: M&E website and MobilApp; Proposing tools and equipment to support implementation of M&E for PFES.

2.1.5 Running test of the PFES M&E system

Developing a mechanism for assigning, decentralizing the use of software, steps to operate the M&E system; Try out the questionnaires, data collection forms; extracting data, reporting; Proposal of operating process for the M&E system.

2.2 Research Methods

2.2.1 Viewpoint and Methodology

2.2.1.1 The system approach point of view

Research on PFES M&E must take into account the impact of natural, economic and social factors, must collect relevant information and analyze them in an integrated relationship.

2.2.1.2 Sustainable Development Approach

PFES must have a better impact on the environment, economy and society, and there should be M&E criteria reflecting these aspects.

2.2.1.4 Evidence-based and Performance-based Approach

PFES M&E indicators built based on the evidence and achievements of the policy. The logical framework for researching and building the FES payment monitoring system of the thesis is as follows:

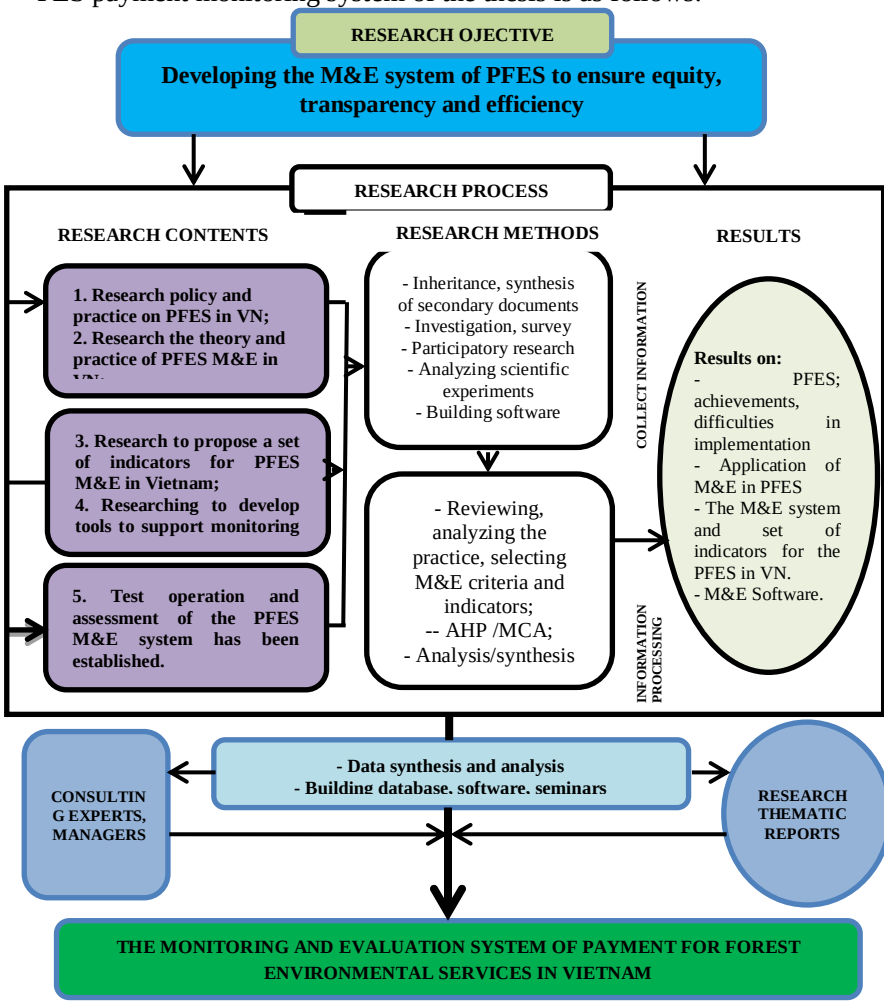

Figure 2.1: LogFrame of building the M&E system of PFES in Vietnam

2.2.2 Methods of studies

2.2.2.1 Research on the theoretical and practical basis of PFES M&E

a) The inheritance of secondary document: Subject inheritance, review and analysis of documents: policy documents, regulations on FES and PPFES; documents, data on PFES implementation; Typical PFES studies on PFES such as indicators supported by ADB, VNFF, FORLAND, PanNature and CIFOR.

b) Descriptive statistical method: The document and data are screened, arranged in the form of tables or presented in the form of charts to find out the rules of evolution, set M&E criteria, standards to be monitored.

2.2.2.2 Research to propose a set of M&E indicators for PFES

a) Expert consultation method: consulted with experts on principles of selecting the criteria and indicators of M&E; The opinion of pairing the M&E standards and criteria in AHP/MCA. Experts have also been consulted on quantifying the value of the M&E indicators.

From the OECD principles (SMART), experts are invited to select and identify M&E standards, criteria and indicators;

b) Multi-criteria analytic hierarchy process: AHP/MCA analysis is used to calculate weights and check the advantages of the M&E indicator sets.

2.2.2.3 Developing tools for PFES M&E

Two products found by the thesis: (i) NgheAnPFES mobile software for Android and (ii) Website application integrating WebGIS technology in the PFES M&E. From inputed data, the software automatically calculates and gives the evaluation results of the M&E system.

CHAPTER 3: RESEARCH RESULTS AND DISCUSSION

3.1 Policy and reality of PFES in Vietnam

3.1.1 Identifying PFES objectives need M&E

The PFES policy objective is to strengthen forest protection through: (i) socialization of forest protection resources; (ii) create livelihoods for people involved in forest protection and (iii) reduce the burden of the state budget on forest protection. Therefore, the construction of the M&E system for PFES must measure the policy on: forest protection, mobilizing social resources to participate in forest protection, improving livelihoods compared to the main goal of the policy.

3.1.2 Characteristics and principles of PFES need M&E

3.1.2.1 Characteristics of PFES

Firstly, in the relationship of FES trading, there is an unequal

knowledge level of the parties, the number of buyers and sellers is limited. Therefore, the policy implementation tents to low transparency, so it is necessary to conduct M&E on transparency.

Second, due to the free-access of FES even without the consensus of the supplier, which easily leads to inequity, there should monitor the fairness in policy implementation.

Third, due to the specific characteristics of this service, the payment for FES is basically through the FPDF. Therefore, the current PFES M&E system needs to be linked to the structure and operation of the FPDF.

3.1.2.2 Principles of PFES

The important principles of FES in the Law on Forestry 2017, which are considered as standards of M&E, are: "to ensure publicity, democracy, objectivity and equity". Thus, the M&E of PFES needs to indicate the level of the response to the three standards of Equity, Transparency and Efficiency.

3.1.3 The contents PFES need M&E

3.1.3.1 PFES amount to pay and get paid

a) Payment level and amount payable by FES users: The amount of FES using payment is not fixed, depending on the users' declared data, it is necessary to monitor these data.

b) Unit price and amount received by FES providers

The PFES amount to be paid is regulated as follows:

$$\left|\begin{matrix}\textit{Amount paid to FES}\\ \textit{providers (VND)}\end{matrix}\right| = \left|\begin{matrix}\textit{Amount paid for 01}\\ \textit{ha of forest (VND)}\end{matrix}\right| \times \left|\begin{matrix}\textit{Forest area providing FES of owners}\\ \textit{converted by coefficient K (ha)}\end{matrix}\right|$$

(Source: Decree No. 156/2018 / ND-CP)

The data on unit price, rate, total PFES amount paid should have a M&E on compliance, transparency and fairness.

3.1.3.2 Management mechanism and use of FES money

a) PFES trust mechanism: The positions and responsibilities between VNFF, Provincial FPDFs, FES users and providers under the mandate mechanism are the basis for monitoring stakeholders in PFES.

b) Management and use of FES money: In fact, FPDFs have different rates of using and distributing money, it is necessary to have compliance indicators for monitoring the rate of PFES money compared to the total PFES budget, total family income or the rate of PFES money spent on community welfare to evaluate the equity and socioeconomic efficiency of PFES.

3.1.3.3 PFES procedure preparation

The PFES profile is the legal basis containing information that the related parties must comply with content, form and method of payment, management and use. These are the elements that need to have an assessment of compliance, completeness and transparency of the PFES records and information.

3.1.3.4 Annual PFES planning and implementation

The revenue and expenditure plan is the basis of the annual operational orientation of the FPDF. This document contains information that needs to be monitored on operational content, progress and quality of PFES activities.

3.1.3.5 Regulation and status of PFES reporting

The reporting of PFES related agencies is now basically sufficient in quantity and in time according to the regulations. However, the content of the report is mainly on achievements, listed activities, and lacks of monitoring tool between periods. It is necessary to design M&E indicators, information collection forms, and M&E report templates that improve existing types of progress reports.

3.1.3.6 Regulation and status of PFES M&E

The M&E of PFES is regulated in the Law on Forestry 2017. Responsibility for monitoring PFES is also stated in Decree No. 156/2018/ND-CP, but these documents do not specify the concept, content and M&E implementation process. On that basis, VNFF has developed a manual on inspection and supervision of PFES, but implementation is still difficult. On the other hand, VNFF guidelines are following the inspection approach, not yet a comprehensive PFES monitoring system has been developed.

3.1.4 Orientation of M&E for PFES operated by FPDF

3.1.4.1 Parties participating in PFES implementation

The FPDF system plays a central role in the entire PFES policy implementation process. Therefore, when building the PFES M&E system, it is necessary to have an implementation process associated with the FPDF organization in the relationship with the parties as described in the following diagram.

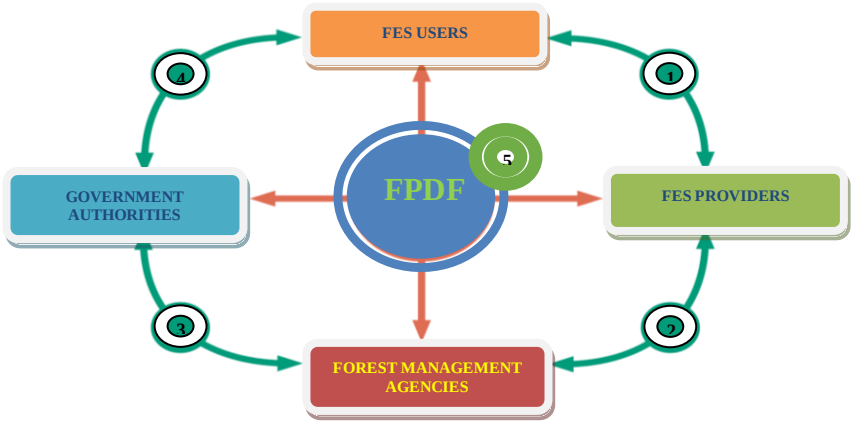

Figure 3.1: Diagram of related parties in PFES

3.1.4.2 Regulation on the policy implementing organization

The current implementing organization of PFES policy in VN is linked with the organization and operation of the FPDF system. Operational principles of the FPDF also need to ensure "fairness, transparency and efficiency" - similar to the principles when implementing the PFES policy. Therefore, when building the M&E system for PFES in VN, we must aim to evaluate the equity, transparency and effectiveness of the policy.

3.1.4.3 The state of the PFES implementing organization

Depending on the province, the FPDF may be under the Provincial People's Committee or under the Department of Agriculture and Rural Development. However, the operating mechanism and professional procedures are basically unified nationwide. A good PFES monitoring system in one province will also be essentially relevant to other provinces.

3.1.5 M&E on results of PFES policy implementation

3.1.5.1 Types of FES have been paid

The current PFES in VN mainly comes from hydroelectricity, accounting for nearly 97%. From that fact, in the immediate future, the construction of an indicator set on PFES of FES only needs to focus on the first type of FES, for revenue from hydroelectric plants.

3.1.5.2 FES payment volume conducted

As of December 31, 2018, the PFES debt amount nationwide was VND 79,325 billion, accounting for 0.8% of the total PFES amount

receivable during the whole period or 2.7% of the receivable amount in 2018. To improve efficiency and transparency in policy implementation, "outstanding debt" is an important monitoring indicator. Regarding revenue distribution, although the amount collected from VNFF accounts for nearly 72%, then 99.5% is coordinated to provinces to pay forest owners. Therefore, the monitoring of PFES should design the main criteria for the implementation at the provincial level.

The total money for policy implementation management is VND 790,128 billion, accounting for 7.7% of FES money. The operational spending level of 7.7% nationwide reflects the financial efficiency of the current FPDF system, but it should be defined as a criterion for regular monitoring. The rate of PFES money paid to forest owners, households and communities shows the fairness and effectiveness of policies that need to be assessed for monitoring.

Currently, the PFES still uses a lot of cash, potentially lack of transparency and risks. This should have tracking indicators to evaluate the transparency and effectiveness of the system.

3.1.5.3 Efficiency of PFES policy

The PFES policy has many advantages. The effects brought from FES is difficult to deny, but still lacks scientific and professional proof. In fact, due to the lack of methodical monitoring, it not only affects the reliability of the report but also reduces the accountability of whether the policy implementation process ensures the principles of fairness and transparency and effectiveness as proposed.

3.2 Theory and practice of M&E on PFES in Vietnam

3.2.1 Theoretical basis for M&E on PFES

3.2.1.1 Contents, purpose and requirements of the M&E on PFES

a) Contents of monitoring of PFES: PFES monitoring is a system that includes indicators, tools and processes to continuously monitor the implementation situation, serving as a basis for systematically evaluating the level of compliance with regulations, ability to achieve and meet the policy objectives, thereby timely proposing solutions. In other words, the PFES M&E is a system that continuously collects information on PFES implementation, processes information according to a predetermined process, evaluates policy implementation status and proposes solutions to improve PFES.

b) The purpose of PFES M&E: The M&E of PFES aims to continuously monitor the implementation of the policy, assess the

current situation, identify the causes, and serve as a basis for proposing solutions to continuously improve and overcome the shortcomings in policy implementation.

c) Requests for PFES M&E system: PFES M&E system needs to ensure the feasibility, reliability, cost savings and reflect the equity, transparency and efficiency of PFES policy according to law. In addition, the M&E indicator set of the system must be developed to ensure the SMART principles, established support tools and have a technical process to manage and operate the M&E system effectively.

3.2.1.2 The principles of PFES M&E

PFES M&E needs to ensure: Right object, scope and content of PFES need monitoring; Do not interfere with the work of stakeholders; There must be standards, criteria and indicators that are well established and approved for use; To consider comprehensively and synchronously issues related to the PFES implementation process; Solutions and proposals must be practical, specific and feasible; M&E results must be processed, responded to positively and systematically archived.

3.2.2. Practice of PFES M&E

3.2.2.1 Data groups providing information for PFES M&E

There are 5 main data groups on PFES: (i) forest and forest owners, (ii) FES users, (iii) PFES situation, (iv) PFES effectiveness, and (v) PFES policy. PFES monitoring system must be designed compatible with the structure, content and types of PFES information data.

3.2.2.2 Data types of PFES M&E

Data in PPFES is mainly in 3 main forms: document format, numerical form and map format. Based on the form of data to design an appropriate tool to collect and analyze M&E information.

3.2.2.3 Sources of information for PFES M&E

According to regulations, the sources of data on PFES are mainly forest owners, FES users, CPCs of communes that provide FES, FPD, FPDF, and relevant sectors. Capture the source of the data to define the responsibility for collection and where to collect the information for the M&E on PFES.

3.2.3.4 Management and use information for PFES M&E

Current situation of managing the database (database) on FES is the foundation to decide the ability to provide input information for the monitoring of PFES (Details of statistical results are in the thesis Annex).

3.2.3 Progress in developing M&E indicators for PFES

Up to now, there are 5 objectively methodical studies building sets of indicators for PFES M&E. The M&E indicator set financed by ADB in cooperation with VNFF, led by Angus McEwin and Nguyen Manh Ha (2015) (referred to as ADB's set of M&E indicators) has 43 monitoring indicators. This is considered as one of the earliest researches on M&E for PFES in VN. This work is the premise for further studies on PFES M&E. However, this indicator set does not have tools to collect information, lack of technical guidance, so its applicability is low.

According to the order of the VNFF, Vuong Van Quynh and Nguyen Khac Lam (2016) have consulted the ADB indicator set, the study proposed the VNFF indicator set including 22 monitoring indicators and 13 evaluation indicators. The purpose of M&E is to verify the transparency, equity and effectiveness of PFES implementation. M&E information is collected regularly according to the reporting period of the FPDF system and can be used for periodic evaluation quarterly, annually or for a 5-year period.

From the two indicator sets above, Nguyen Viet Dung et al (2017) of the Forest Land Coalition (FORLAND) research group inherited and added the evaluation content about answering questions and complaints related to expenditures and develop with a set of questions to collect information for indicators. This indicator set is divided into 13 monitoring indicators and 10 indicators for evaluating the transparency, fairness and efficiency of the PFES.

Meanwhile, PanNature, combined with WWF support, also selectively inherits two sets of indicators from ADB and VNFF has selected a number of FPDFs to test in the field, at the same time develop WebGIS tools and integrate integration into the monitoring process to increase usability. This set of indicators uses 18 monitoring indicators and 9 evaluation indicators according to 4 groups (1) Institution, policy and executive direction, (2) Economy, (3) Society, (4) Environment.

Next, Pham Thu Thuy et al (2018) developed the CIFOR indicator set based on the VNFF's M&E framework and financial support from the VFD project. This set of M&E indicators includes 31 indicators, divided into 4 groups: (1) Institution, organization, policy, direction, administration, (2) Environment, (3) Finance/economy, (4) Social. CIFOR's indicators have a methodical academic assessment method, but may require high costs, a lot of time and manpower to conduct.

3.2.4 Comment on the state of PFES M&E

PFES M&E in VN is mainly in the way of traditional reporting and assessment, sometimes inconsistent between periods, focusing in qualitative terms, lack of background database and scientific analysis. Currently, out of the 44 Provincial Forest Protection and Development Funds, some have not paid attention to M&E, some provinces are interested but have not implemented M&E or are applying different sets of indicators, lack of uniformity in approaches, methods and the content among provinces. On the other hand, scratching by the importance of the criteria (due to lack of weights) shows that these M&E indicators themselves are not really fair.

3.3 Proposing an indicator set for PFES M&E in Vietnam

3.3.1 Structure of the M&E indicator set for PFES

Proposing that the M&E set of indicators for PFES includes 3 layers as follows.

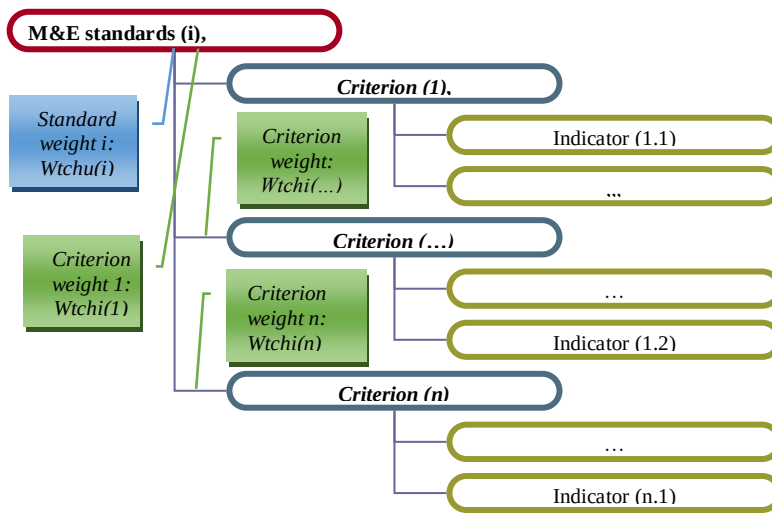

Figure 3.9: Structure of the set of indicators for M&E on PFES

3.3.1.1 M&E Standards for PFES

M&E standards for PFES are the requirements and expectations for the policy implementation process to ensure the payment process, payment results as well as the provision of FES meeting the objectives and suitable for the purpose. An M&E standard may include one or more M&E criteria.

3.3.1.2 M&E Criteria for PFES

An M&E criterion for PFES is a part of an M&E standard to test or

evaluate the attainment of that standard of the policy. The content of criteria includes requirements on quantity, quality, time, ability to comply with regulations on PFES implementation. An M&E criterion may have one or more M&E indicators.

3.3.1.3 M&E indicators for PFES

An M&E indicator of PFES is a sign or quantity to measure an aspect of policy implementation and shows whether the change or direction of the PFES policy has brought about the expected results. The same grouping indicators are used to provide indicators for one criterion of monitoring of PFES.

3.3.2 Content of M&E standards for PFES

(i) Standard of transparency: is the insightful nature of payment activities as the basis of payment, payment progress and results.

(ii) Standard of equity: is the compatibility between the benefit level with the effort to create the value of FES, fairness among the beneficiaries, fairness between those who are paid FES and those who are others in the community.

(iii) Standard of efficiency: is an increase in income for forest protectionists and an increase in resources for forest protection and development in general. Thereby, FES contributes to economic growth, job creation, social stability and protection of forest resources and environment.

3.3.3 Content of M&E Criteria for PFES

3.3.3.1 Criteria under the Transparency standard

- Criterion 1.1: The disclosure of information and data on the revenues and expenditures of PFES.
- Criterion 1.2: Management status of PFES database.
- Criterion 1.3: Ensuring the access to PFES information of stakeholders.
- Criterion 1.4: System for monitoring, responding to, answering questions and resolving complaints.

3.3.3.2 Criteria under the Equity standard

- Criterion 2.1: Equal payment for FES according to forest type, forest condition, forest origin and protection difficulty level.
- Criterion 2.2: Equitable PFES according to the area and compliance level of FES users.
- Criterion 2.3: Ensuring fairness in distribution of benefits from FES.

3.3.3.3 Criteria under the Efficiency standard

o Criterion 3.1: Ensuring efficiency in forest protection and management.

o Criterion 3.2: Ensuring socio-economic efficiency.

3.3.3.4 Determining important levels of M&E standards and criteria

a) The importance of 3 M&E standards of PFES: The analysis results of AHP/MCA and the calculation of the priority of the criteria are illustrated in the next graph. Figure 3.11 shows that the three evaluation criteria with importance do not differ much (less than 10%). In which, the Efficiency of FES is considered to be more important and the next is the Transparency and Equity standards in order of less importance but also equally high level of importance.

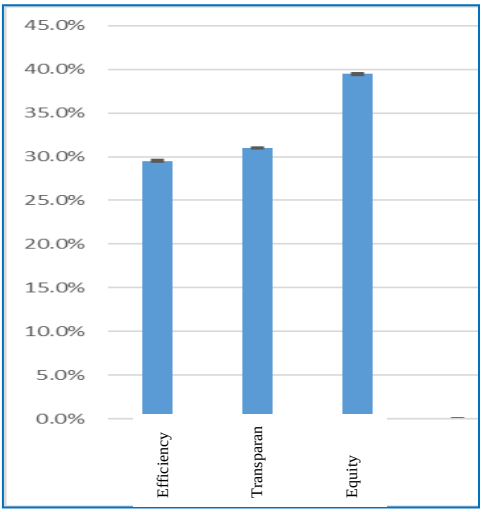

Figure 3.11: Important levels of PFES criteria

b) The importance of M&E criteria for PFES: With similar AHP analysis tools, the weighting results for the M&E criteria of PFES are presented in Tables from 3.4 to 3.6 below.

Table 3.4: Weights of Equity criteria

	M&E criteria	Explanation	Weight	+/-
1	Apply coefficient K	Level of application of coefficient K in payment	0.21	0.9%
2	Commensurate with the effort	Payment map updated according to forest changes	0.42	1.9%
3	Benefit sharing	Payment to Hhs, community; community construction	0.37	1.7%

Table 3.5: Weights of Transparency criteria

	M&E criteria	Explanation	Weight	+/-
1	Public information	Disbursement rate, debt, distributed rate	0.19	1.9%
2	Data management	Update map data, payment data	0.36	4.5%
3	Access to information	Propagating, training and publishing data	0.16	1.0%
4	Feedback response	Number of inspections, solving rate, repeated quest.	0.29	3.6%

Table 3.6: Weights of Efficiency criteria

	M&E criteria	Explanation	Weight	+/-
1	Forest protection	Proportion of forest area protected, extent of forest protection violations	0.55	0.0%
2	SocioEcomic impacts	The rate of PFES in forest protection capital, increase income and employment	0.45	0.0%

After determining the weights for the M&E standards and criteria, the selection of scales, scoring/quantifying the values of indicators becomes easier and more scientific. The supervisor can apply an equal scale to groups of indicators with different levels of importance. Then, using the corresponding weights to convert the total M&E scores to true values.

3.3.4 Developing M&E indicators for PFES

3.3.4.1 Requirements of the M&E indicators

- Ensuring to monitor progress, compliance with regulations and the quality of FES provision: reflect the effectiveness (measure the achievement of the goals, the purpose of the policy), the impact (measure the the positive and negative impacts the policy has on the economy, environment, society), the appropriateness (measuring the compliance of the activities with the policy), sustainability (measuring the measure whether the policy benefits will be sustained or not).

- Ensuring to monitor transparency and fairness in the implementation of PFES policy.

3.3.4.2 Principles of selecting M&E indicators

Indicators should follow the SMART principles: specific and easy to understand, measurable, available and relevant, reliable, timely.

3.3.4.3 Content of the M&E indicators

On the basis of the VNFF indicator set (built by Vuong Van Quynh and Nguyen Khac Lam 2016), the thesis has reviewed four more sets of indicators for PFES M&E that are being applied by some FPDFs in VN according to the requirements and principles set out in Sections 3.3.4.1 and 3.3.4.2. Thereby, suitable indicators from the VNFF's set of indicators of the M&E are retained, non-conforming indicators are adjusted or removed, then supplemented with good CIFOR indicators such as the group of indicators that reflect socio-economic results, good FORLAND indicators such as the group of indicators on level of questioning and water quality monitoring, etc. (details in the Annex).

After being developed, supplemented and adjusted by the thesis, the set of indicators is proposed to be named the VNUF M&E indicator set,

including 3 standards, 9 criteria and 32 indicators. Specifically, the content and method of quantifying values for the VNUF indicator set are in the thesis Annex.

3.3.4.4 PFES M&E marking scale

The proposed evaluation criteria and scale are as follows:

+ Transparency standard: very transparent (5 points); high transparency (4-5 points); medium transparency (3 - 4 points); low transparency (2 -3 points) and non-transparency (less than 2 points).

+ Equity standard: very fair (5 points); fairness high (4-5 points); average fairness (3 - 4 points); fair low (2 -3 points) and unfair (less than 2 points).

+ Efficiency standard: very effective (5 points); high efficiency (4-5 points); average efficiency (3 - 4 points); low efficiency (2 -3 points) and ineffective (less than 2 points).

+ Good indicators: are indicators with points 4 and 5; Average indicators: are those with score 3; Indicators that need to be improved: are indicators with points equal to 1 and 2. Then the system will recommend that there should be a solution to improve the situation.

3.4 Tools and processes for M&E of PFES

3.4.1 Forms for collecting M&E information

M&E indicators are measured using pre-made data collection templates. The list of 32 forms to collect information about PFES is presented in the thesis Annex.

3.4.2 Developing software and equipment recommendation for M&E

The thesis has researched and applied WebGIS technology and Java programming language to develop Website and mobile software for M&E of PFES.

3.4.3.1 Applying WebGIS technology

The website for monitoring and evaluating PFES at provincial level is built on WebGIS platform, providing utilities to help manage and convenient monitoring of PFES situation. The website is currently running at: http://ngheanpfes.ifee.edu.vn. The main functions of the M&E Website include:

- Input and edit function of input data;
- Data extraction and use function: (i) Evaluate according to 3 standards; (ii) Extract statistical tables; (iii) Extract the M&E report.
- Map data management function.

3.4.3.2 Development of forest patrol software on mobile devices

The software is developed by the project with the name NgheAnPfes, assisting users in forest patrolling, forest inspection by digitizing information about the route, patrol area, inspection location, events (including images) need monitoring, reporting.

The software can be used to: Obtain reports; feedback from forest owners; Data processing; Provide forest map information; Patrol and protect forests.

3.4.3 Technical process and organization for M&E implementation

3.4.3.1 Technical process of PFES M&E

a) Diagram of information flow of M&E for PFES

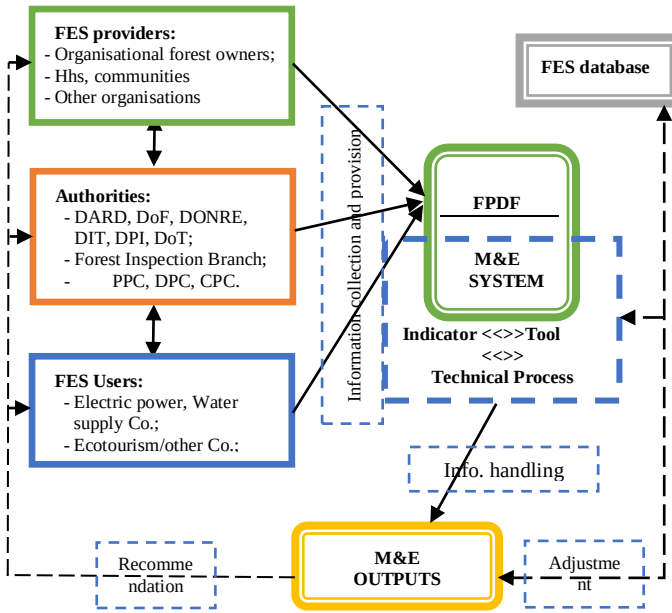

Figure 3.17: Diagram of information flow on the M&E of PFES

b) Proposing the technical process of M&E for PFES

DRAFT

TECHNICAL PROCESS FOR APPLYING IT IN M&E FOR PAYMENT OF FOREST ENVIRONMENT SERVICES

1. Name of the technical process

Technical process for applying IT in Monitoring and Evaluation of Payments for Forest Environmental Services in Vietnam.

2. Author

Group of authors: Mr Nguyễn Khắc Lâm, Prof. Vương Văn Quỳnh,

Assoc.Prof. Nguyễn Hải Hòa, PhD. Lê Sỹ Doanh.
Organization: VN University of Forestry; Address: Xuan Mai, Chuong My, Hanoi.
Tel: 02433 840 233 E-mail: khcn@vfu.edu.vn

3. Origin of the technical process

The technical process of applying IT in the forest environmental services payment monitoring and assessment is part of the results of the forestry doctoral thesis "Research to propose a monitoring and evaluation system for forest environmental services payment policy in Vietnam" by the researcher Nguyen Khac Lam of the Vietnam Forestry University, implemented from 2016 to 2020.

4. Summary of technical process content

This technical process automatically assesses the equity, transparency and efficiency in PFES. It allows extracting a summary table of data on PFES policy implementation according to the prescribed form of the VNFF, extracting periodic progress reports on implementation, identifying the good / bad levels of the indicators.
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4.1 The content of the technical process

Technical process includes 5 steps such as diagrams and detailed descriptions in the thesis.

4.2. Location of application

Provincial FPDFs, forestry state management agencies, forest owners and organizations and individuals involved in the PFES policy.

4.3. Application conditions

There is an annual PFES database stored; Have mobile devices running Android operating system that can locate, take pictures, connect to the internet and access the Web; There are human resources to collect additional information, update data and manage the M&E system. ***(see the full version in the thesis)***

3.4.3.2 Organizing the implementation of PFES M&E

The components of the PFES M&E system in operation are shown in Figure 3.18. The steps for implementing M&E are described in the draft M&E Technical Procedures.

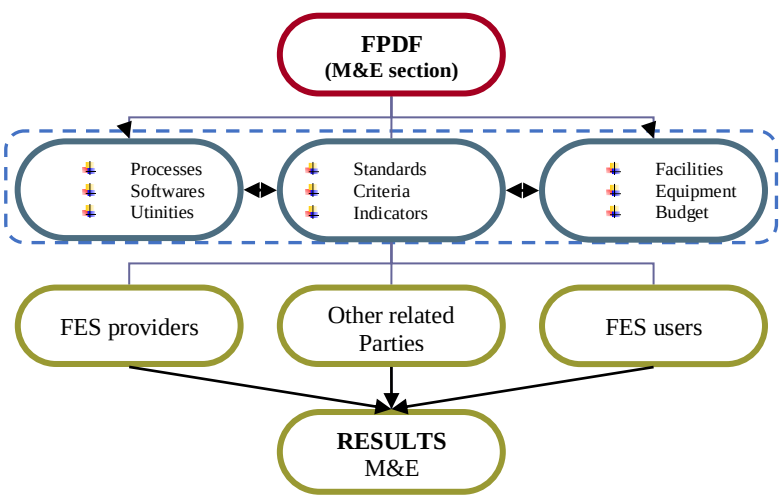

Figure 3.18: Elements of the M&E system

In the PFES M&E system, M&E personnel is both a component and the coordinating center of the system; Indicators are variables to load data for the system; tables, software and calculation formulas are convenient tools to increase system productivity; machine equipment is the means of operating the system; FES providers/providers and related parties are the subject of the M&E system.

3.5 Running test and checking the M&E system

3.5.1 Trial operation of the M&E system

The thesis has tested the operation of the PFES M&E system with the provincial data collected in 2018. The test shows that the system operates satisfactorily. The M&E software is relatively stable, quickly giving assessment results and extracting reports as required. Within the study scope, the dissertation only presents the results and comments on the M&E results in Nghe An province (see Table 3.9 automatically extracted from the software), which is the province to be collected the most complete M&E information.

Table 3.9: Result of the PFES M&E in Nghe An province 2018

Transparent standards	***Result***	***Point 3.3***	***Transparent level:***			***High***		
(Very high, high, medium, low, very low)	1. Good indicators	1.1.1	1.1.3	1.1.4	1.2.2	1.4.2		
	2. Normal inds	1.3.1	1.3.2	1.3.3	1.3.4			
	3. Bad indicators	1.1.2	1.2.1	1.4.1	1.4.3			
Equitable Standards	**Result**	**Point 3.3**	**Equitable level:**			**High**		
(Very high, high, medium, low, very low)	1. Good indicators	2.3.1		2.3.2				
	2. Normal inds		2.1.2					
	3. Bad indicators	2.1.1						
Efficient Standards	**Result**	**Point 4.6**	**Efficient level:**			**Very High**		
(Very high, high, medium, low, very low)	1. Good indicators	3.1.1	3.1.2	3.1.3	3.1.4	3.1.5	3.2.1	3.2.2
	2. Normal inds	3.2.3	3.2.4					
	3. Bad indicators	3.2.5						

The results show that the PFES policy in Nghe An in 2018 is highly transparent, quite equitable and very effective. In which, 14/27 indexes

are at good level, 7 indicators are normal and 6 indicators need improvement.

3.5.2 Operational evaluation and completion of the M&E system

The testing process shows that the M&E system has many advantages, but it also generates a number of errors such as: the function of extracting the report when there is a lack of data, the calculation of the debt ratio is inaccurate when the data is incorrect. These errors have been investigated and fixed.

This shows that it is necessary to continue to improve and approve the process of operating the M&E system; clearly specifying the responsibilities of all parties in information collection and provision, type of information, and time of provision of information monitoring; research to improve the security of the system; adding module linking existing PFES database, allowing to extract map/data by layer of information as needed.

3.5.3 Checking the advantages of the M&E system

3.5.3.1 Identify the criteria and the importance of the criteria

There are 8 criteria selected to test the superiority of the M&E indicators. These are: legality, technicality, economy, usability, mobility, inclusiveness, specificity, and interconnection. Implement AHP/MCA analysis, with the number of criteria n = 8, look up the table, we have a random index RI = 1.41. The minimum consistency ratio for case n> 4 is assigned as CR = 10%. The results of the calculation of the priority of the criteria are illustrated in Figure 3.20.

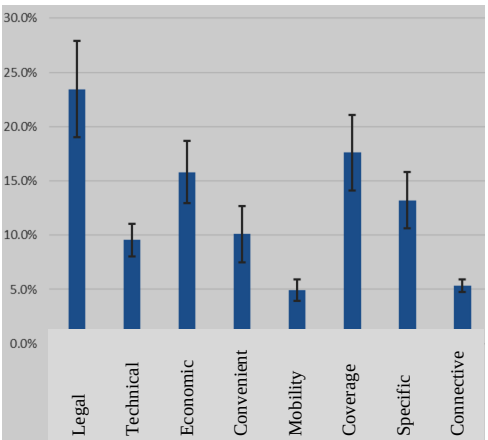

Figure 3.20: The importance level of selected criteria

Determining the priority of each criterion helps the synthesis of the results of comparing

the M&E indicators for each criterion become more scientific and fair. In addition, this is also important information when building an M&E system, which criterion should be paid more attention.

3.5.3.2 Compare indicator sets according to each criterion

Analyzing and comparing individual sets of monitoring indicators according to each criterion shows that each set of indicators has its own advantages and shortcomings. The analysis results show that in terms of legality criteria, the M&E Indicators of VNUF and FORLAND are rated the highest. Regarding technical aspects, in turn, the higher evaluation results belong to the set of indicators of ADB, PANN and VNUF. While, CIFOR's indicator set has a plus point for Coverage and Specificity.

3.5.3.3 Summary results of comparing the indicator sets on all criteria

Analysis by AHP/MCA method has synthesized the evaluation scores of the M&E indicators with all 8 criteria as shown in Table 3.21.

Table 3.21: Results of scoring indicator sets

Names of Indicator sets		Justification	Point (max 100)	+/-
1	ADB	The study supported by ADB	13.3	1.0%
2	VNUF	The study supported by VNFF	31.6	3.3%
3	FORLAND	The study supported by FORLAND	13.9	1.4%
4	CIFOR	The study supported by CÌFOR	21.1	1.1%
5	PANN	The study supported by PanNature	20.1	1.6%

As a result, 3 sets of indicators (VNUF, CIFOR, PANN) have above average scores. With a score of 31.6/100, the VNUF indicator set is considered to be the most preeminent overall, so it should be selected to be developed for application in the PFES assessment in VN. However, when comparing on each criterion, each set of monitoring indicators has its own strengths. Therefore, in the process of perfecting the M&E system, it is necessary to continue to analyze, inherit and develop the advantages of each set of monitoring indicators.

CONCLUSIONS AND RECOMMENDATIONS

1. Conclusions

The rapid growth in operational scope and financial scale, on the one hand, affirms that the PFES policy is the right direction and a good development trend. At the same time, that fact also sets out for the

policy to soon build an M&E system to implement the policy and manage and use the PFES money in a transparent, fair and effective manner. To respond to that, the thesis has conducted the following contents:

- The thesis has clarified the theoretical basis and practical requirements of the PFES through analysis of regulations, conditions, requirements and status of the PFES policy in VN. Thereby, the thesis has pointed out the contents that need to be monitored and what groups of data to be evaluated through;

- Identified the structure and content of the PFES indicator set, including 3 standards, 9 criteria and 32 monitoring indicators, which are suitable for the assessment of equity, transparency and effectiveness of PFES policy according to regulations;

- Having studied and built a M&E tool set including information collection forms, a set of score sheets associated with the weights of criteria and standards, field information collection software and online M&E software to increase convenience, professionalism and productivity;

- A technical process has been drafted to apply IT to the operation of the PFES M&E system and proposed a method of testing the preeminence of the M&E system by AHP/MCA multi-criteria analysis.

Thus, the dissertation has contributed to strengthening the theoretical and practical basis of M&E for PFES, contributing to the implementation of policies to ensure fairness, transparency and efficiency in accordance with the Forestry law of VN. The results of the dissertation can be applied to practical implementation of PFES policy in VN as well as a reference for the next research on M&E and on PFES policy.

2. Limitations

Besides the results achieved, the thesis still has a number of shortcomings that need further research and completion. Firstly, in terms of the scope, research topic of the policy and the PFES situation nationwide, but within the limits of the thesis, the testing of the new M&E system has been implemented in a few localities. Second, some monitoring indicators have been developed to meet policy requirements, but until 2018, there are not enough data to experiment. Third, the

current WebGIS software is developed to optimize the interface for the computer that is not yet smartphone friendly. In contrast, current mobile forest patrol software does not automatically connect information with WebGIS software on computers. In addition, the software for phones has only just developed to be compatible with the Android operating system, so there are some types of phones from companies like Apple iOS that have not been installed.

3. Recommendations

- The M&E system of the thesis has just been built, it needs to be researched and tested with data from many provinces, for several years, with different types of FES to ensure broad compatibility, and at the same time there are upgrades, further adjustment to suit the specifics of each locality. Further testing with the data for the years after 2018 also helps to verify the indicators that in 2018 do not have enough data.

- Continue to research and develop some other features for forest patrol software on mobile devices and WebGIS tools such as: automatic linking, sharing data (*when using forest patrol software on the device mobile, the field information is automatically uploaded to WebGIS tools in real time or when there is a 3G connection*); automatic warning *(after periodic input, if the evaluation results are below average, the WebGIS tool appears to warn the user to promptly have solutions to improve)* for good management of the PFES policy in Vietnam.