

EFFECTIVENESS OF PAYMENT FOR FOREST ENVIRONMENTAL SERVICES (PFES) TOWARD SUSTAINABLE FOREST MANAGEMENT IN DA BAC DISTRICT, HOA BINH PROVINCE

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SUMMARY

By conducting interviews, summarizing and analyzing secondary documents, and employing a set of published indicators to evaluate the payment for forest environmental services (PFES), the research has examined the current status of the forest in the study area as well as the contribution of special-use and protection forests to revenue improvement from PFES. The results show that PFES in Da Bac district has high transparency, fairness and effectiveness. However, the results of the SWOT analysis demonstrate that the current situation of PFES and forest protection and development in Da Bac have been facing many difficulties and challenges, such as poor coordination among stakeholders in implementing PFES; forest protection and development with low effectiveness and consolidation; lack of forest rangers according to the provisions of law; pressure caused by natural forest exploitation activities of people living in neighboring communes outside the basin; and regularly updated technology requiring forest rangers and staff from the forest protection and development fund to quickly perceive it in order to successfully complete their tasks. Therefore, solutions have been proposed to improve the effectiveness of PFES towards sustainable forest development.

Keywords: Da Bac district, efficiency, PFES, sustainable forest development.

1. INTRODUCTION

Payments for Ecosystem Services (PES) (e.g. Wunder, 2005, 2015; Muradian et al., 2010; and Vatn, 2014) has been considered as a useful policy instrument for influencing land-use decisions (Daniels et al., 2010; Kemkes et al., 2010; and Thu Thuy Pham et al., 2015). In recent decades, PES has emerged as a promising instrument for a coupled success in ecosystem conservation and poverty alleviation (Landell-Mills and Porras, 2002; Pagiola et al., 2005; and Wunder, 2008), and the Payment for Forest Environmental Services (PFES) scheme in Vietnam is one of the best examples (Ngoc T.B.Duong, Wouter T. De Groot, 2020). The policy of PFES, after more than 10 years of implementation, has had great impacts on all three aspects of Vietnam's economy, society and environment (Nguyen Khac Lam et al., 2020). Through the implementation of a financial mechanism, forest beneficiaries are responsible for contributing to forest protection and development. Forest owners in Da Bac district

receive PFES through the Forest Protection and Development Fund, from Hoa Binh Hydroelectricity, Suoi Nhap Hydroelectricity, Dong Chum Hydroelectricity, and Vinaconex Water Plant (Pham Van Kha, 2021).

There have been a number of research works related to PFES policy and sustainable development, such as Payment for forest environmental services in Vietnam, from policy to practice (Thu Thuy Pham et al., 2013), Monitoring and evaluation of Payment for Forest Environmental Services in Vietnam: From myth to reality (Thu Thuy Pham et al., 2015), Researching and proposing a monitoring and evaluation system for payment for forest environmental services in Vietnam (Nguyen Khac Lam, 2021), Indicators for monitoring and evaluating payments for forest environmental services (Vuong Van Quynh, 2016), Policy on PFES associated with sustainable forest protection and management in Muong Te district, Lai Chau province (Nguyen Xuan Truong et al., 2021). PFES has been conducted in Da Bac district since 2013 and it is necessary

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to examine this policy application. This study aims to evaluate the effectiveness of payment for forest environmental services towards sustainable forest development for Da Bac

district, Hoa Binh province.

2. RESEARCH METHODOLOGY

2.1. Study site

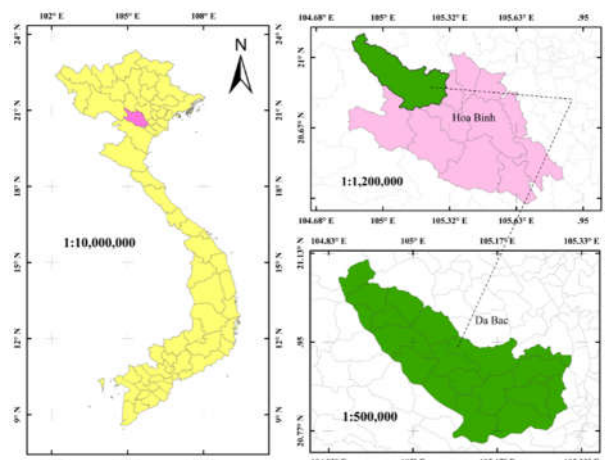


Fig. 1. Location map of Da Bac district (Hoa Binh province)

Da Bac district is located in the northwest of Hoa Binh province (Fig. 1). Geographically, it borders Hoa Binh city to the east, Phu Yen and Van Ho districts of Son La province to the west, Cao Phong, Tan Lac, and Mai Chau districts to the south, and Thanh Son and Tan Son districts of Phu Tho province to the north. Da Bac

district has a total natural area of 77,976.8 ha and includes 17 communes and town. The total area of forest land is estimated at 60,037.4 ha. Communes in the district have completed the allocation of land, contracted forests, and granted forest land use rights (Table 1).

Table 1. Area of forest and forestland by owners

No	Types of owner	Areas (ha)
1	The owners of the forest are the organizations	7,484.3
2	Forest owners are village communities	38,936.4
3	Forest owners are individuals or households	13,616.7

(Source: Report of Da Bac Forest Ranger Department, 2021)

Table 1 shows that the area of forest and forestland of Da Bac district is basically allocated or contracted to communities, individuals, and households for management and protection. This is a community-based

forest management solution that is highly effective in forest management and protection. The area of forest and forestland according to the use purpose in Da Bac district is shown in Table 2.

Table 2. Area of forest and forestry land by usage purposes

Land types	Areas (ha)			
	Total area (ha)	Natural forest	Production forest	Bare land
Planned land for forestry	60,037.4	28,704.7	17,747.5	13,585.2
1. Special Forest land	5,092.3	4,829.8	32.2	230.3
2. Protection forest land	29,008.3	17,576.8	6,071.2	5,360.2
3. Production forest land	25,936.8	6,298.1	11,644.1	7,994.6

(Source: Report of Da Bac Forest Ranger Department, 2021)

Table 2 shows that there is currently a very large area of vacant land planned for forestry (13,585.2 ha), which is being implemented with afforestation plans. The area of protection and special-use forests is mainly natural forest (65.7%) that are receiving large payments for forest environmental services and need to be protected and developed sustainably.

The Forest ranger department of Da Bac district cooperates with local authorities to inspect the protection of forests bordering on other districts, where deforestation conducted for shifted cultivation, land disputes, and exploitation, trade and storage of forest products often occur, in order to detect, prevent and promptly handle acts of encroachment on forest resources. The Forest ranger department has handled 13 administrative violations, in which, 03 cases of deforestation for farming; 06 cases of illegal transportation of forest products; 02 cases of illegal storage, trading and processing of forest products, decreased 06 cases compared to 2020. In 2021, Da Bac district planted 1,013.5 hectares of forest. The Forest Protection and Development Fund was established in 2012 and the PFES policy has been implemented since 2013.

2.2. Methods

Literature review: Information and data on PFES activities in Da Bac district for the period of 2018-2021 were reviewed. The information and data sources include legal documents,

payment data, reports etc.

Social survey: The study conducted a total of 10 interviews, including 4 interviews with the Forest Protection and Development Fund in Hoa Binh province and 6 interviews with Da Bac district. The interview focuses on information related to indicators for assessing transparency, fairness, and effectiveness of PFES activities, as well as the advantages, disadvantages, opportunities and challenges in implementing PFES in Da Bac district.

Local people were firstly selected according to the ratio of the area to be paid for PFES. Then, ninety (90) forest owners were continued to be chosen in accordance with the criteria of equal distribution of income such as rich, poor, and medium levels, ethnic groups, genders, and literacy. The content of the interviews focuses on assessing the satisfaction level of beneficiaries from the PFES policies as well as the advantages, disadvantages, opportunities and challenges in implementing PFES in Da Bac district. The study collected information related to the assessment of fairness, transparency and effectiveness through a set of monitoring and evaluation indicators.

To assess the levels of transparency, fairness and effectiveness, the study applied a set of evaluation indicators developed by Vuong Van Quynh, (2016). These indicators are summarized in Table 3.

Table 3. Indicators used to assess the transparency, fairness and effectiveness of PFES

No	Evaluation Index	Criteria	Score
Transparency Evaluation Index			
1	The appropriate level of expenditure items with the provisions of the PFES	The average deviation of money for management, reserve fund and other expenses from regulations < 5%.	1.0
2	Debt ratio	- Debt ratio 5-10%	1.0
		- Debt ratio <5%.	2.0
3	Rate of disbursement to forest owners	- Rate 80-90%	1.0
		- Rate > 90%.	2.0
4	Disbursement rate to small forest owners and contract owners	- Rate 80-90%	1.0
		- Rate > 90%.	2.0
5	Difficulty, easy access to PFES data	- All data is stored in the provincial fund,	1.0
		- All data is stored in the provincial fund in the form of digital files,	2.0
		- All data is stored in the national PFES database.	3.0

Management of Forest Resources and Environment

No	Evaluation Index	Criteria	Score
Fairness Evaluation Index			
1	Equity of PFES by forest quality.	- Apply a coefficient of K_1	1.0
		-Apply a coefficient of K_2	2.0
		-Apply a coefficient of K_3	3.0
2	Equity of PFES by forest area.	- There is a list of forest plots in the file No.	1.0
		- There is a list of forest plots in the digital file matching the digital map	2.0
		- There is a list of forest plots in the digital file that matches the forest inventory map.	3.0
3	Equity of PFES between forest owners and the rest of the community in benefiting from PFES.	- Spending for community welfare 10 - 20%	1.0
		- Spending for community welfare 20 - 30%	2.0
		- Spending for community welfare >30%	3.0
Effectiveness Evaluation Index			
1	Percentage of forest area receiving PFES that have been allocated or contracted to individuals, households and communities.	- Rate 70-90%	1.0
		- Rate >90%	2.0
2	Community participation rate in forest protection	- Rate: 5% - 10%	1.0
		- Rate >10%	2.0
3	Level of damage caused by forest fires and deforestation	- Level 1-2%	1.0
		- Level <1%	2.0
4	Level of violation of forest law	- Level : 70-80%	1.0
		- Level : <70%	2.0
5	Contribution of PFES to people's lives	- Contribution of PFES to people's lives: 5-10%	1.0
		- Contribution of PFES to people's lives>10%	2.0

The total score of the Evaluation are shown in Table 4.

Table 4. Evaluation of transparency, fairness, and effectiveness of PFES

No	Level	Score	Evaluation
1	I	<2	Not transparent, not fair, not effective
2	II	3-4	Low transparency, Low fairness, Low effectiveness
3	III	5-6	Medium transparency, medium fairness, medium effectiveness
4	IV	7-8	High transparency, High fairness, High effectiveness
5	V	9-10	Highest transparency, Highest fairness, Highest effectiveness

(Source: Vuong Van Quynh, 2016).

From the results of interviews with officers working for the Forest Protection and Development Fund in Hoa Binh province and Da Bac district as well households benefiting from the PFES policy, combining with experts' consultation, the study group developed a table of SWOT which analyzes the strength, weakness, opportunities, and threats of PFES implementation in Da Bac district. Finally, based on the results of assessing effectiveness of forest environment payment in Da Bac district and SWOT analysis, solutions for

improving PFES application in Da Bac district were proposed.

3. RESULTS AND DISCUSSION

3.1. Effectiveness of forest environment payment in Da Bac district

3.1.1. Implementation of PFES policy for the period 2018-2021

The area of forest receiving payment from various business entities involving in the implement of the policy of PFES for the period 2018-2021 is shown in Figure 2.

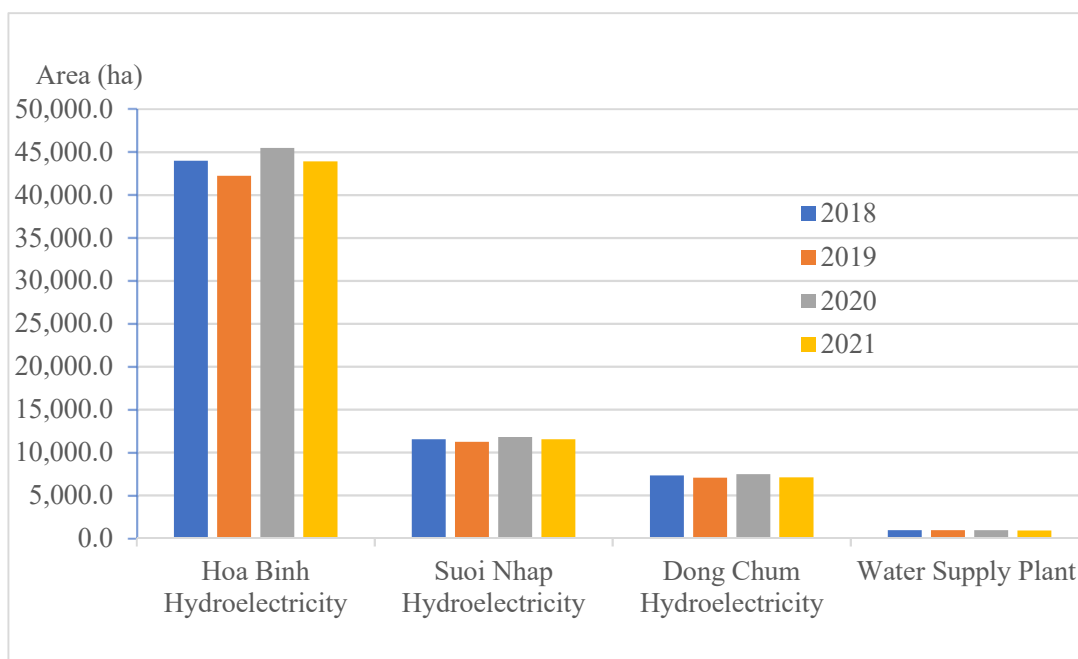


Fig. 2. Area of forest paid for forest environmental services by service users in the period 2018-2021

(Source: Hoa Binh Forest Protection and Development Fund in 2018, 2019, 2020, 2021)

Fig. 2 shows that 69.1% (nearly 45,000 ha) of the total forest area were paid by Hoa Binh hydropower plant, while a very small proportion of 1.43% was paid by the Water supply. Particularly, the figures remained

almost the same for four years from 2018 to 2021. The area receiving payment for forest environmental services by forest types is shown in Figure 3.

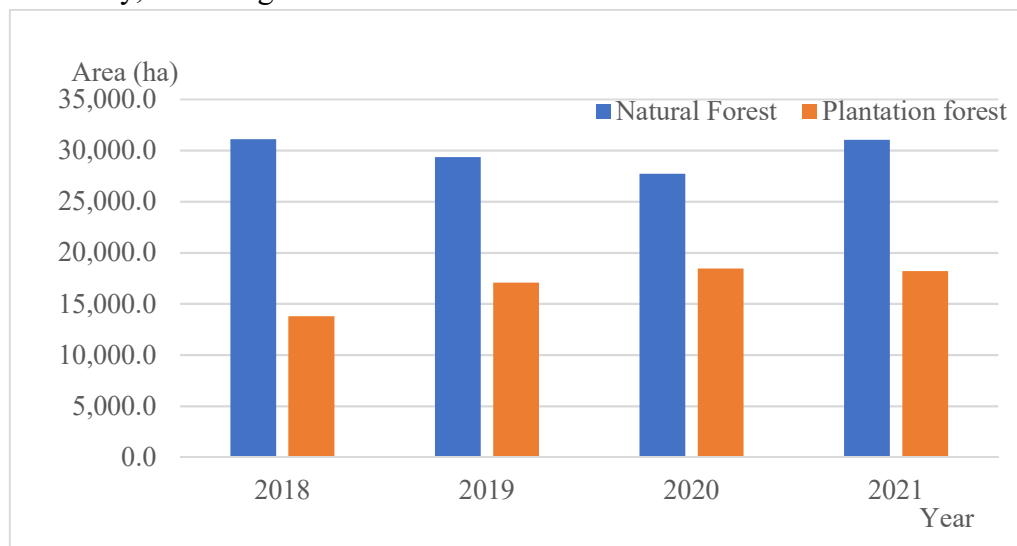


Fig. 3. Area paid for forest environmental services in the period 2018-2021 by forest types

(Source: Hoa Binh Forest Protection and Development Fund in 2018, 2019, 2020, 2021)

Fig. 3 shows that the area of plantation in 2020 and 2021 was higher than that in 2018 and 2019 because of the increase in the area of forest planted from the period of 2016 – 2017. The reduction of natural forest area from 2018 to 2020 was due to the decrease in the areas of

Schizostachyum forest, of which a proportion died after flowering and seed setting. In 2021, the area of natural forest was zoned for cultivation and regeneration became forest, consequently, the area of this forest type increased.

3.1.2. Effectiveness of the policy of payment for forest environment services in Da Bac district, Hoa Binh province

The study evaluated and quantified levels of

transparency, fairness, and effectiveness of the policy of payment for forest environmental services in Da Bac district. The results are presented in Tables 5, 6, and 7.

Table 5. Results of assessing transparency of PFES

No	Evaluation Index	Criteria	The results of interviewees' responses (%)	Scores
Transparency Evaluation Index				
1	The appropriate level of expenditure items with the provisions of the PFES	The average deviation of money for management, reserve fund and other expenses from regulations < 5%.	100	1
2	Debt ratio	- Debt ratio 5-10%;	21	1.8
		- Debt ratio <5%.	79	
3	Rate of disbursement to forest owners	- Rate 80-90%	30	1.7
		- Rate > 90%.	70	
4	Disbursement rate to small forest owners and contract owners	- Rate 80-90%	49	1.5
		- Rate > 90%.	51	
5	Difficulty, easy access to PFES data	- All data is stored in the provincial fund,	0	2
		- All data is stored in the provincial fund in the form of digital files,	100	
		- All data is stored in the national PFES database.	0	

Table 6. Results of assessing the fairness of PFES

No	Evaluation Index	Criteria	The results of interviewees' responses (%)	Scores
1	Equity of PFES by forest quality.	- Apply a coefficient of K_1	0	2
		-Apply a coefficient of K_2	100	
		-Apply a coefficient of K_3	0	
2	Equity of PFES by forest area.	- There is a list of forest plots in the file No.	0	3
		- There is a list of forest plots in the digital file matching the digital map	0	
		- There is a list of forest plots in the digital file that matches the forest inventory map.	100	
3	Equity of PFES between forest owners and the rest of the community in benefiting from PFES.	- Spending for community welfare 10 - 20%	12	2.3
		- Spending for community welfare 20 - 30%	48	
		- Spending for community welfare >30%	40	

Table 7. Results of evaluating the effectiveness of PFES

No	Evaluation Index	Criteria	The results of interviewees' responses (%)	Scores
1	Percentage of forest area receiving PFES that have been allocated or contracted to individuals, households and communities.	- Rate 70-90%	21	1.8
		- Rate >90%	78	
2	Community participation rate in forest protection	- Rate: 5% - 10%, - Rate >10%	20 80	1.8
3	Level of damage caused by forest fires and deforestation	- Level 1-2%	59	1.4
		- Level <1%	41	
4	Level of violation of forest law	- Level : 70-80%	47	1.5
		- Level : <70%	53	
5	Contribution of PFES to people's lives	-Contribution of PFES to people's lives: 5-10%	48	1.5
		Contribution of PFES to people's lives>10%	52	

In comparison to the values introduced by Vuong Van Quynh, (2016), the results in Tables 5, 6, 7 show that measured scores of all three aspects of transparency, high fairness, and effectiveness of PFES activities in Da Bac district are relatively high. Particularly, the contribution of PFES to the lives of people in Da Bac district are similar to the results of the study conducted in Moc Chau - Son La (at 9.52%) (Pham Thu Thuy et al., 2021). However, the information of PFES has not been adequately communicated to the public. Therefore, it is necessary to improve the accessibility to information on payment for forest environmental services with transparency; improve the ratio of using payment from PFES to the community in equity; and effectively reduce forest fires and deforestation.

Although PFES activities in Da Bac district, Hoa Binh province have achieved high results in all 3 criteria of transparency, fairness, and efficiency, in the actual implementation process, there are still many difficulties and challenges. Therefore, it is necessary to identify advantages, disadvantages, opportunities, and threats to gradually improve the quality of PFES to "Very Transparent", "Very Fairness" and

"Very Effective". Therefore, in order to gradually improve the quality of PFES, it is necessary to implement solutions to improve the Evaluation Index such as Rate of disbursement to forest owners, Disbursement rate to small forest owners and contract owners, Difficulty, easy access to PFES data, Equity of PFES by forest quality, Equity of PFES by forest area, Equity of PFES between forest owners and the rest of the community in benefiting from PFES, Level of damage caused by forest fires and deforestation, Level of violation of forest law, Contribution of PFES to people's lives. The appropriate solutions will be presented in the following parts in combinations such as Mechanism and policy solutions, Solutions to attract the participation of local people, Solutions for training and technology transferring.

3.2. Advantages, disadvantages, opportunities, and threats in payment for forest environmental services

Based on the results of interviews and expert method, advantages, disadvantages, opportunities, and threats of PFES implementation in Da Bac district have been identified, discussed, and analysed. The summary is given in Table 8.

Table 8. Strengths, weaknesses, opportunities, and threats of the policy of PFES in Da Bac district

Strengths (S)	Interviewees' responses (%)	Weakness (W)	Interviewees' responses (%)
S1: Abundant labor force sources, hard - working local people who are willing to receive new knowledge to help improve labor productivity.	88	W1: Economic conditions in the area are still difficult, and transport infrastructure has not met the needs of local people.	100
S2: People's spiritual life is closely linked with the forest, creating a premise for forest protection.	100	W2: The levels of education are still low. There are many outdated customs. Lives of local people are still dependent heavily on nature. The production activities are inefficient and resulting in destruction of forest resources.	92
S3: Forest rangers are professionally trained and experienced. They are responsible for their work, especially, courageous and drastic in acts of deforestation.	93	W3: The coordination among stakeholders is not really effective and not synchronized.	90
S4: The local government supports and responds enthusiastically to the implement of PFES policy.	81	W4: There is a shortage of forest rangers in accordance with the law.	95
S5: Most of the commune's civil servants are ethnic minorities, so they understand the customs, habits, language, and difficult circumstances of the people.	100	W5: Some local cadres have not been drastic and protective of their loved ones in handling violations in the field of wildlife management.	66
Opportunity (O)		Threats (T)	
O1: There will be many forestry and eco-tourism projects invested.	82	T1: Forest resources are increasingly depleted, particularly, without the consensus and help of local people.	76
O2: Non-timber forest product revenues and PFES will improve and raise incomes for local people.	100	T2: There is a threat of illegal natural forest exploitation conducted by people from neighboring communes and districts where PFES policy is not applied.	100
O3: Forest rangers are getting younger and will receive a lot of attention and support from the state.	96	T3: The salary of forest rangers is low compared to work pressure.	
O4: Developed technology, modern machinery and equipment help a lot in forest management and protection and PFES.	82	T4: Technology, which is regularly updated, requires forest rangers and staff of the forest protection and development fund to be quick to receive and understand in order to successfully complete their job duties.	94
O5: Commune and district officials, who are reputable, will be trained to improve their professional skills. As a result, the dispute resolution in the forestry field will get better.	85		100

The analysis results provided in Table 8 are the bases to develop strategic solutions for forest protection and development, and PFES with following directions: (i) Pursuing opportunities that align with strengths; (ii) Overcoming weaknesses to make good use of opportunities; (iii) Determining how to use advantages and strengths to minimize risks caused by the external environment; and (iv) Establishing a plan to avoid the weak points being more severely affected by the external environment.

3.3. Solutions to improve the effectiveness of PFES policy combining with forest protection and sustainable development

The study results 3.1 and 3.2 are the bases for research group to propose solutions in order to improve the performance of PFES in Da Bac district.

3.3.1. Mechanism and policy solutions

There should be a mechanism to encourage people, especially indigenous people, to participate in forest protection and development, to contribute to poverty reduction, and to reduce pressure on forest resources (S1T1);

The authorities of Da Bac district should give priority to policies strengthening to attract talents, especially young cadres who are able to quickly access to modern machinery and technology (S4O4).

It is necessary to complement a number of forest rangers to match with the requirement, and have appropriate remuneration policies, especially for forest rangers working in remote communes where they are often pressured by forest resources exploitation. (W4T3).

Particularly, the Da Bac Fund needs to closely cooperate with the Hoa Binh Fund in storing and transferring all PFES to the national forest environmental service database. It is also important to carefully balance the revenue in PFES payments to increase the rate of community welfare. While the study results show positive assessment, it is necessary to continue to improve the transparency, equity and effectiveness of PFES activities in Da Bac district.

3.3.2. Solutions to attract the participation of local people

The participation of residents can be improved by propagating the benefits of joining in a forest protection group which can both protect the forest environment and generate income for local people. Preserving forests is to conserve traditionally cultural values, maintain indigenous traditional occupations, and sustain income from PFES (S2T1).

It is necessary to strengthen unified coordination among stakeholders, especially encourage people and communities inside the basin (receiving PFES payments) to participate in protecting and developing the existing forest area, reducing pressures of illegal forest exploitation conducted by communities outside the basin (where PFES are not received) (W3T2).

3.3.3. Solutions for training and technology transferring

It is necessary to organize professional training courses for forest rangers, forest protection and development fund staffs, and other stakeholders on the implementation of PFES policy, focusing on such contents as identifying and making statistics on PFES users; and determining the scope, boundaries and scale of forest areas applying PFES policy by the use of modern tools and equipment (O4T4).

The next solution is to organize propaganda, training and technology transfer classes for people, especially indigenous people, to participate in forestry and eco-tourism projects to create livelihoods for local people.

4. CONCLUSIONS

Da Bac district has great potential for revenue from the participation in PFES policy because of its forest area and forestry land, especially special-use forest, protection forest, and part of the production forest area.

The results of evaluating PFES implementation in accordance with the set of criteria of Vuong Van Quynh, (2016) in Da Bac district show high transparency, high fairness, and high effectiveness. However, in the actual conduction process of PFES, there are still many difficulties and challenges. Therefore, it is necessary to identify the advantages, disadvantages, opportunities and challenges in order to gradually improve the quality of PFES

implementation in Da Bac district.

Research results have found five (05) strengths, five (05) weaknesses, five (05) opportunities, and four (04) threats for the conduction of PFES and forest protection and development in Da Bac district. This is an important basis for proposing solutions to improve the effectiveness of PFES policy implementation, as well as to protect and develop sustainably forests for the study area.

Solutions to improve the efficiency of PFES associated with forest protection and sustainable development include solutions to mechanisms and policies; solutions to attract the participation of indigenous people; and solutions for training, training, and technology transfer. Among these solutions, there should be a mechanism to encourage local people to participate in forest protection and development, contributing to poverty reduction and mitigating pressure on forest resources. The government of Da Bac district should give priority to policies strengthening to attract talents, especially young cadres. It is also necessary to strengthen unified coordination among stakeholders and organize propaganda, training, and technology - transfer classes for local people, especially indigenous people, to enable them to participate in forestry and eco-tourism projects.

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HIỆU QUẢ HOẠT ĐỘNG CHI TRẢ DỊCH VỤ MÔI TRƯỜNG RỪNG HƯỚNG TỚI QUẢN LÝ RỪNG BỀN VỮNG TẠI HUYỆN ĐÀ BẮC, TỈNH HÒA BÌNH

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TÓM TẮT

Bằng việc sử dụng phương pháp phỏng vấn, phương pháp kế thừa các tài liệu thứ cấp, và bộ chỉ số đánh giá công tác chi trả dịch vụ môi trường rừng (DVMTR), nghiên cứu đã ghi nhận thực trạng rừng tại khu vực nghiên cứu, vai trò của rừng tự nhiên của là rừng đặc dụng, rừng phòng hộ góp phần tăng nguồn thu từ chi trả dịch vụ môi trường rừng. Kết quả cho thấy hoạt động chi trả dịch vụ môi trường rừng có tính minh bạch cao, tính công bằng cao và tính hiệu quả. Hơn nữa, kết quả phân tích SWOT cho thấy thực trạng chi trả DVMTR, bảo vệ và phát triển rừng tại Đà Bắc còn gặp nhiều khó khăn, thách thức như sự phối hợp giữa các bên liên quan trong chi trả DVMTR; bảo vệ và phát triển rừng chưa thực sự hiệu quả, chưa đồng bộ; biên chế kiểm lâm còn thiếu theo quy định của pháp luật; áp lực khai thác rừng tự nhiên từ người dân ở xã, huyện giáp ranh, bên ngoài lưu vực; công nghệ thường xuyên cập nhật, đòi hỏi cán bộ kiểm lâm và cán bộ quỹ bảo vệ và phát triển rừng phải nhanh nhạy tiếp thu để hoàn thành tốt nhiệm vụ. Vì vậy, các giải pháp đã được đề xuất để nâng cao hiệu quả công tác chi trả DVMTR hướng tới phát triển rừng bền vững.

Từ khóa: Chi trả dịch vụ môi trường rừng, huyện Đà Bắc, hiệu quả, phát triển rừng bền vững.

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