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Fairness and Transparency in Payment for Forest Ecosystem Services Programs in Vietnam: A Community Based Evaluation

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Abstract

Payment for forest environmental services (PFES) has been widely implemented in Vietnam for enhancing the reforestation and conservation of natural resources. However, fairness and transparency in the implementation of PFES programs have not been given due attention. In order to gather the community's opinions about the fairness and transparency of PFES's implementation, two case studies of direct and indirect payment programs in Bac Kan Province were selected to investigate. In this study, a five-point scale to rank the levels of "importance" and "implementation" of eight criteria of fairness and five criteria of transparency were used. There were 167 people who participated in the evaluation process through a questionnaire. The results pointed out that the community highly evaluated fairness and transparency in terms of "importance". Nevertheless, the "implementation" of these criteria had lower evaluation points. In comparing the evaluation results between the service providers and buyers, there were no statistically significant differences in terms of the "important" criteria. However, the difference between providers' and buyers' evaluations regarding "implementation" were significant, with the mean values of the providers' being relatively higher than the buyers'. In addition, the analyses also found that participants in the direct program evaluated fairness and transparency higher than those in the indirect program. Finally, we state that policymakers and other stakeholders should include fairness and transparency criteria in designing the evaluation framework of PFES programs in Vietnam in order to promote more participation of people and improve the sustainability of PFES programs.

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Keywords

Ba Be district, evaluation, fairness, payment for forest ecosystem services, transparency, Vietnam

Introduction

Payment for ecosystem services (PES) has become an effective tool in resources management and is being broadly implemented in many countries and international programs, for example: EU greenhouse gases emission trading (European Climate Exchange, 2008); SO_2 exchange in the United States (Stavins, 1998); Costa Rica's PSA program (Pagiola, 2008); the PROFAFOR carbon sequestration program in Ecuador; the National Program for Hydrological Services (PSAH) in Mexico (Muñoz-Piña *et al.*, 2008); and the sloping land conservation program of China (Bennett, 2008). Generally, PES programs can be divided into two types of payment: direct payment and indirect payment (Engel *et al.*, 2008). In direct payment programs, the buyers are usually either service consumers or price setters. The buyers of indirect payment programs are significantly different, and they are not direct consumers. Most of them are government institutions or NGOs. They play a role as representatives of service users. Service consumers are not directly involved in the trading system, which means they are not price setters either.

In Vietnam, a national payment for forest ecosystem services (PFES) program has been implemented since 2010 with Decree No. 99/2010/ND-CP (Government of the Socialist Republic of Vietnam, 2010). In this Decree, the Vietnamese government confirmed two types of PFES programs, direct and indirect payment systems. The content of the Decree also pointed out four types of forest services that could be applied in PFES: (i) watershed forests; (ii) conservation forests and ecotourism forests; (iii) forests being protected to increase their carbon sink capacity in order to reduce greenhouse gas emissions and sustainable forest development; and (iv) forests providing spawning grounds, natural water, and natural feeds and breeds for aquaculture activities. Since the authorization of Decree No. 99/2010, the PFES policy has been widely implemented in various areas of Vietnam. The national evaluation conference of the PFES program, after five years of implementation, stated that this policy received significant public support and promoted the positive impacts the program had on the environment and socio-economy growth (Dung, 2015). The conference, nevertheless, pointed out the lack of monitoring and evaluation mechanisms while implementing this policy. According to the analysis, most PFES programs in Vietnam were carried out by the government and local institutions, and focused mainly on evaluating the process of activities; meanwhile, there was insufficient attention to the performance of fairness and transparency.

Fairness and transparency are essential for PFES programs. They have been studied diversely in many aspects around the world, but this issue is almost never mentioned or mentioned rarely in PFES programs in Vietnam. The concept of equity is understood as equality between individuals participating in and sharing the benefits from PES despite their differences in social, political, and economic statuses (Pascual *et al.*, 2010). In Vietnam, PFES programs have tried to equalize payments for all participants in order to achieve a fair share of benefits. Research by Loft *et al.* (2017) in Dien Bien showed that the vast majority of households participating in the PFES program favor equal sharing. Only a few households favor payments based on work effort. The original idea of the Government of Vietnam in designing different payment levels for different forest areas based on the K-coefficient (K1, K2, K3, K4) was not consistent with local perceptions. Therefore, when implementing PFES payments, most localities apply the K-coefficient = 1 for all forest types (Pham *et al.*, 2003). Equal payments appear to be aimed at fairness in benefit sharing, but in reality, they are unfair and inadvertently destroy the incentive to protect forests (Muradian *et al.*, 2010; Tacconi, 2012). This issue was pointed out by Bao Huy (2009) who analyzed the PFES program in Lam Dong province. The local people's motivation to protect forests has been lost because active and non-active participants were paid equally, and good quality forest areas were paid the same as bad quality forest areas. This is why equal payment should be

carefully considered in terms of equity. In addition, Pagiola & Platais (2007), when discussing fairness in PES programs, mentioned the ability to access and participate in the program by everyone in society. In developed countries, private ownership of resources ensures equity in participation in PES. However, in Vietnam, forest ownership belongs to the State, so ensuring that all people in society can access and participate in the PFES is an important aspect. This issue is more important because Vietnam's forest areas are distributed in mountainous areas that focus mainly on ethnic minorities and the poor. Ensuring the access and participation rights of disadvantaged groups in society, such as ethnic minorities, the poor, and women, are aspects that need special consideration when considering the fairness of a PFES program (Vien *et al.*, 2016).

Transparency in the payment of environmental services is understood as the accurate and timely provision of the necessary information to all stakeholders (Kolstad & Wigg, 2009). Tacconi (2012), when defining PES, pointed out that transparency is always mentioned by researchers in evaluating the performance of a PES program. In addition, the provision of complete and timely information contributes to increasing the bargaining power of environmental service providers to receive higher payments (Landell-Mills & Porras, 2002). The weak negotiating capacity of the suppliers was the main reason for the low level of payments in the voluntary PFES program in Bac Kan (Vien *et al.*, 2016). On the other hand, Mulgan (2000), when analyzing the transparency of PES programs, emphasized the importance of clearly defining the specific rights and responsibilities of the stakeholders. This was a factor that greatly affected the results of voluntary transactions between buyers and sellers of environmental services, according to the theory of Coase (1960). In Vietnam, managers have unanimously pointed out the need to establish operational principles and evaluation mechanisms for PFES programs (Ngai, 2016). The lack of an open and transparent monitoring mechanism has been highlighted as a limitation in the implementation of the PFES policy in Vietnam in recent years (Vietnam Forest Protection and Development Fund, 2016). This study was caried out to contribute to addressing the research gap in fairness and transparency in PFES programs in Ba Be, Bac Kan province of Vietnam.

Methodology

Study site

After the promulgation of Decree No. 99/ND-CP, Vietnam established a national PFES program for large river basins (indirect PFES), in which the payers include hydroelectric power plants, water plants, and industrial establishments that directly use water sources; the beneficiaries are forest owners (national parks, conservation areas, residential communities, households) with the average payment in the period 2010-2016 being 20 VND/kWh for hydropower plants and 40 VND/m^3 for water plants and industrial facilities that use water directly. This payment level increased to 36 VND/kWh and 52 VND/m^3, respectively, in 2017. This program is called the indirect PFES program because it was established by the government, in which the Vietnam Forest Protection Fund (VFPF) is an organization that is authorized to collect money from users of forest environmental services (hydropower plants, water plants, and industrial facilities) then redistribute the money to the forest owners. By the end of 2020, there were 25 provinces out of 59 provinces/cities with forests in Vietnam that had implemented the PFES policies (equivalent to 25 PFES programs at the provincial level). The total number of contracts signed with payers was 871 (of which, 646 contracts were for hydropower plants and water plants; 214 for industrial establishments; and 11 for aquaculture establishments using water). Provinces in Vietnam are not encouraged to develop separate indirect PFES payment programs but must follow the guidance of Decree No. 99/2010/ND-CP. On the contrary, localities

are encouraged to develop voluntary PFES programs (direct PFES). However, up to now, the number of direct PFES programs in Vietnam is very small, appearing only in a few national park areas on a small scale.

This study was based in Ba Be District, Bac Kan province, a mountainous area located in the north of Vietnam (**Figure 1**). Ba Be has 68,412 hectares in total, a mean annual temperature range from 21.98ºC-23.61ºC, a total number of sunshine hours in a year of around 1,283-1,577 hours, an annual precipitation from 1,151.3 to 1,699.2mm, and an annual humidity of 85-86%. In 2019, the total population of this district was 47,415 persons with an approximate population density of 70 persons per km^2. There are four main ethnic groups living in this district, namely the Tay, Dao, Kinh, and H'Mong groups. In

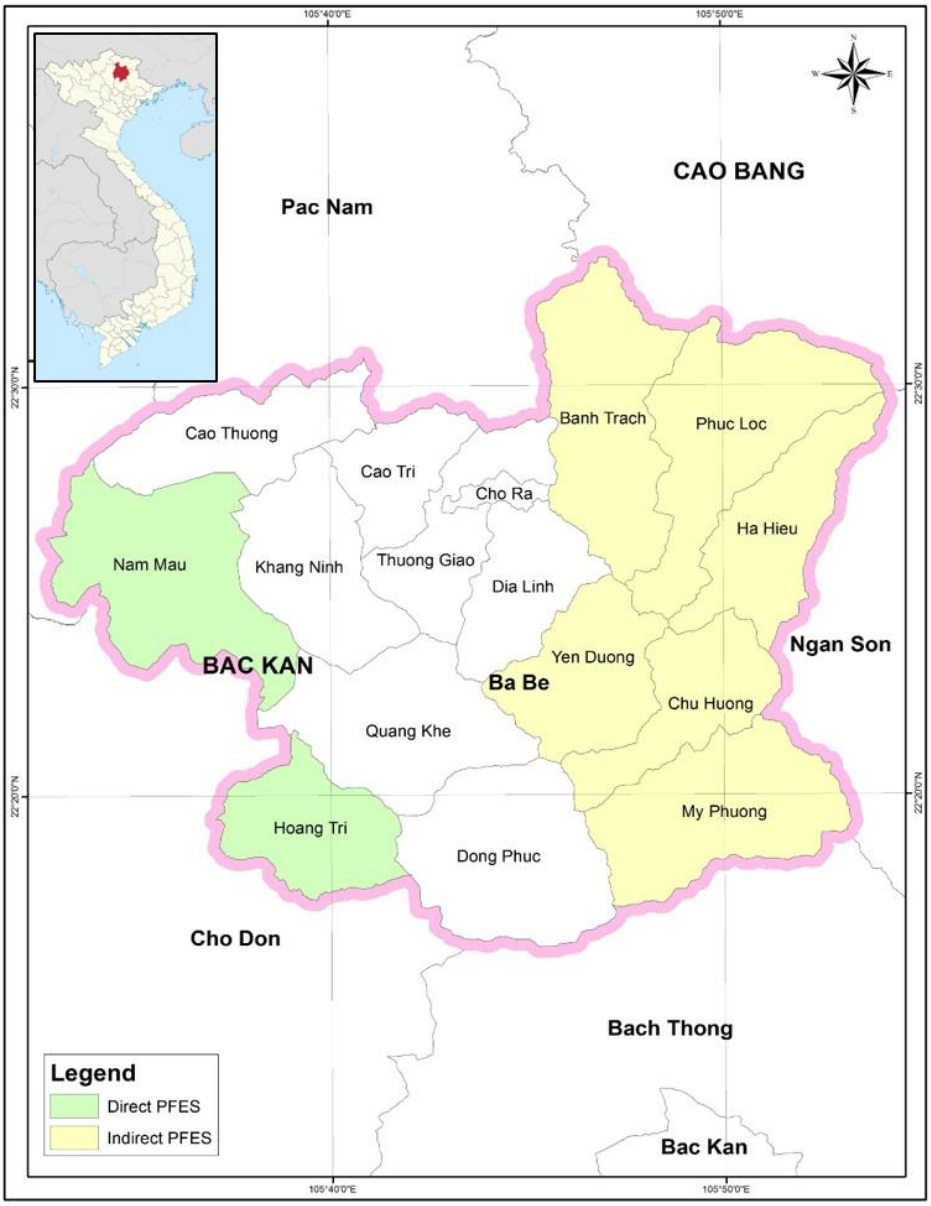

Figure 1. The surveyed communes in the direct and indirect PFES programs in Ba Be district, Bac Kan province

comparison to other districts, Ba Be has slow economic growth, depends deeply on the agro-forestry sector (making up 50% of the total GDP), has low annual income per capita (10 million VND per person), and has a high rate of poverty in comparison to the average rate of Vietnam (18.04% poor households in total) (General Statistics Office in Vietnam, 2020).

Ba Be district is a prominent area for implementing the PFES policy of Bac Kan province in particular and of Vietnam in general. The indirect PFES program was established in Ba Be in 2013 in the Nang River basin. In addition, with the support of NGOs, Ba Be National Park established and began operating a program of direct PFES payments in the Leng River basin. The PFES policy in Ba Be is gradually stabilizing and contributing positively to forest protection. The PFES activities of Ba Be are summarized as shown in **Figure 2**.

With the simultaneous implementation of both direct and indirect PFES, Ba Be became an ideal place to conduct research and evaluate the implementation process of the PFES policy in Vietnam. In this study, we aimed to answer two main questions:

(i) How do the participating people evaluate fairness and transparency in the implementation of the PFES programs?

(ii) Are fairness and transparency better implemented in the direct PFES program or the indirect program?

Secondary data collection

Secondary data on the geographical and socio-economic situations of PFES activities were collected from local institutions, which were the Bac Kan Forest Protection Fund, Ba Be People Committee, Ba Be National Forest, and other relevant agencies.

Household interviews

The PFES programs have been implemented in Ba Be since 2013 with two payment systems: direct payment and indirect payment (**Figure 1**). These two programs were chosen as case studies to investigate the performance of fairness and transparency while implementing the PFES process. The survey process was carried out according to the system (selected survey areas) in 2017 in both the direct and indirect PFES programs.

Indirect PFES programs

The PFES programs of the Tuyen Quang Hydropower Company and Na Hang Hydropower Plant aim to protect forests to maintain water sources through payments to

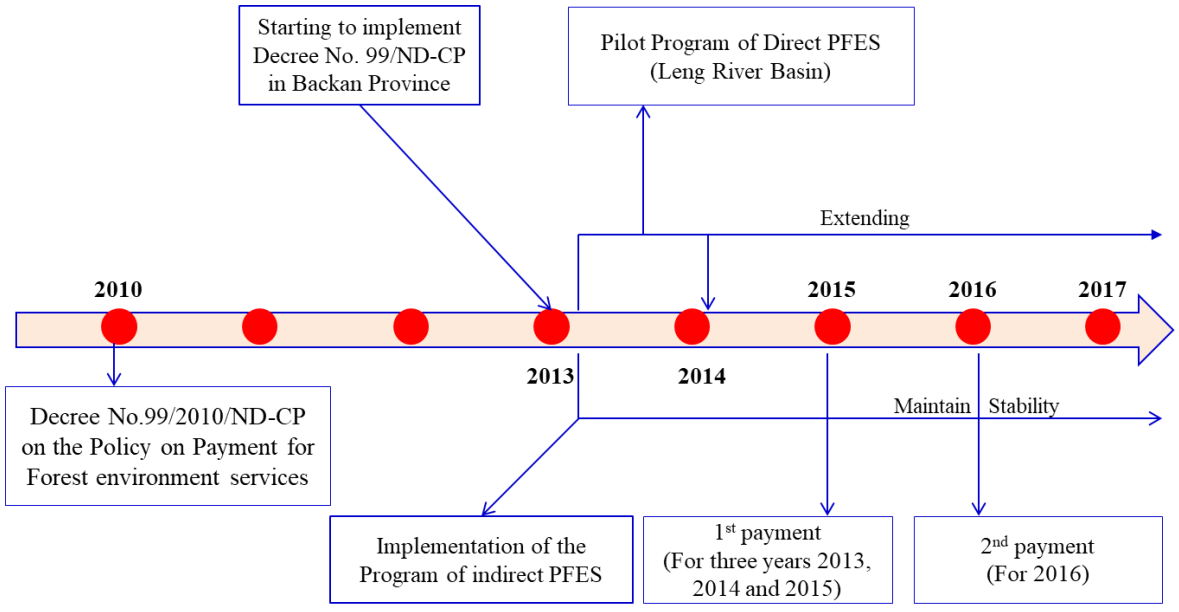

Figure 2. The process of implementing the PFES policy in Ba Be district

forest owners in Ba Be Province (located in the Nang River basin). The payment mechanism operates through the coordinator of state institutions. This program started in 2013 and has completed two payment periods. The first period was in 2015 (payment for the three years of 2013, 2014, and 2015), and the second one was conducted in 2016. The total payment paid was 8.9 billion VND.

In this program, we selected six communes outside Ba Be National Park (not in the core or buffer zone) for investigation, namely Banh Trach, Phuc Loc, Ha Hieu, Yen Duong, Chu Huong, and My Phuong. In each commune, we selected two villages/hamlets to conduct the interview surveys in 2017. The total number of households surveyed in the indirect PFES program was 110 households belonging to 12 villages/hamlets of the six communes (**Figure 1**).

Direct PFES program

In 2013, through the support of the Pro-Poor Partnership for Agroforestry Development Project (3PAD), a mechanism of spontaneous PFES was established. The trading system was carried out by tourism businessmen in Ba Be Lake (who mostly live in Pac Ngoi and Bo Lu hamlet, Nam Mau commune) and the forest owners in Duong hamlet (Hoang Tri commune) in order to protect the forest to maintain clean water for Ba Be Lake (**Figure 1**). This was a spontaneous pilot PFES program run in 2013 and 2014. Two payment periods were completed with a total payment of around 26 million VND. This payment mechanism could be considered a direct PFES program because the buyers were service consumers, and the payment rate was established with the negotiation of all stakeholders. Due to the direct payment program being piloted on a small scale, all 57 households participating in this program were surveyed in 2017. In which, there were 28 tourism business households in the Pac Ngoi and Po Lu hamlets, Nam Mau commune (buyers) and 29 households in Ban Duong village, Hoang Tri commune (providers).

Basic information of the surveyed households belonging to the direct and indirect PFES payment programs is presented in **Tables 1** and **2**.

Key informants interviews

Some interviews with local officials were conducted to collect information on the implementation of the PFES programs in Ba Be district, namely hamlet heads and chairmen of communes in Ba Be district; the director of the Ba Be National Park; and officials of forest protection and development in Bac Kan province.

Fairness and transparency evaluation methods

According to the concerned aspects of fairness and transparency in the actual implementation of the PFES programs around the world and in Vietnam (as discussed in the introduction), we developed a set of eight evaluation criteria for fairness and five criteria for transparency (**Table 3**). The equity assessment criteria utilized in this study were: equity in participation opportunities for all people, for women, and for the poor; participation in discussions and setting reasonable prices for forest environmental services; and fairness in the performance of responsibilities and sharing the benefits of the parties involved in the PFES. Meanwhile, the five transparency criteria were: disclosure of information and operating principles of the PFES program; clearly publicizing the rights and responsibilities of the participating parties; the provision of complete information; and establishing a clear monitoring mechanism.

Criteria for fairness and transparency evaluation

In order to evaluate fairness and transparency, we asked each household to rate the listed criteria (**Table 3**) in terms of both their importance and implementation. We used a five-point Likert scale to gather the responses of interviewees and calculate the mean values for each criterion, and then used the following formula to define the interval value in grouping the community's opinions (Mc Leod, 2008):

Table 1. Basic characteristics of the eight selected communes in Ba Be District (2017)

No.	Location	Population (number of persons)	Number of households	Forest area (ha)	Rate of forest cover	Rate of poor households (%)	Income (million VND/ person/year)	Ethnic composition
				Direct PFES				
1	Hoàng Trĩ commune	1,371	303	2392.9	67.8	26.4	8.0	Tày (72.7%) Dao (23.0%) Mèo (3.1%) Kinh (1.2%)
1.1	Duống village	137	29	530	63.5	34.48	5.15	Tày (82.76%) Dao (17.24%)
2	Nam Mẫu commune	2,145	424	4,888	75.4	39.86	9.9	Tày (54.3%) Dao (29.2%) Nùng (9.0%) Mông (5.4%) Kinh (2.1%)
2.1	Pác Ngòi village	145	37	475		6.45	10.99	Tày (100%)
2.2	Bó Lù village	116	25	316		7.14	22.19	Tày (88.8%) Kinh (9.48%) Nùng (1.72%)
				Indirect PFES				
3	Bành Trạch commune	2,876	727	815.81	67.3	30.1	7.2	Tày (70%) Dao (20%) Kinh (8%) Nùng (2%)
3.1	Hon village	235	56	57.78	80.4	30.4	2.30	Tày (8%) Dao (70%) Nùng (2%) Kinh (20%)
3.2	Nà Nộc village	73	26	95.09	90.6	38.5	4.19	Tày (100%)
4	Phúc Lộc commune	3,157	748	5129.05	49.3	24.5	8.3	Tày (66.8%), Dao (22.0%), Nùng (10.2%), Kinh (1%)
4.1	Thiêng Điểm village	172	38	48.55	64.5	15.8	5.76	Tày (65%) Dao (24%) Nùng (10%) Kinh (1%)
4.2	Cốc Diễn village	214	52	38.90	68.2	19.2	4.78	Tày (5%) Dao (95%)
5	Hà Hiệu commune	2,596	695	2056.97	59.4	22.7	8.5	Dao (50%) Tày (30.5%) Nùng (15.5%)

No.	Location	Population (number of persons)	Number of households	Forest area (ha)	Rate of forest cover	Rate of poor households (%)	Income (million VND/ person/year)	Ethnic composition
5.1	Khuổi Man village	132	39	60.10	68.4	5.1	7.71	Tày (39%) Dao (35%) Nùng (26%)
5.2	Lủng Trảng village	163	42	78.13	70.2	42.5	4.82	Dao (100%)
6	Yến Dương commune	2,482	629	1310.26	74.9	27.8	7.8	Tày (78.8%) Dao (20.4%) Kinh (1.6%)
6.1	Nà Giáo village	135	36	51.14	86.39	25.0	5.19	Tày (93.3%); Dao (5.2%); Kinh (1.5%)
6.2	Phiêng Khẳm village	87	22	191.27	94.29	68.4	3.65	Dao (100%)
7	Chu Hương commune	3,500	861	1816.8	68.8	31.1	8.2	Tày (68.2%) Dao (23.4%) Nùng (6.2%) Kinh (2.2)
7.1	Phiêng Kém village	121	32	30.71	80.35	31.25	4.66	Tày (85.95%); Dao (11.58%) Nùng (2.48%)
7.2	Khuổi Ha village	83	24	21.40	78.02	100	3.11	Dao (100%)
8	My Phương commune	3,505	943	3950.24	82.8	28.3	7.6	Tày (74.5%) Dao (22.5%) Kinh (3%)
8.1	Khuổi Lủng village	67	19	128.75	95.67	36.84	4.12	Dao (100%)
8.2	Thạch Ngõa 2 village	116	35	62.51	87.31	14.28	4.10	Tày (90.51%) Dao (6.9%) Kinh (2.59%)

$$\textbf{interval value} = \frac{\textbf{maximum point} - \textbf{minimum point}}{\textbf{Total ranks}} = \frac{5-1}{5} = 0.8$$

Finally, we used the interval values to classify the responses into different levels (**Table 4**).

Data analysis

Microsoft Excel 2010 and Stata 2012 software were used to synthesize the data and analyze the statistical descriptions. The mean values of the fairness and transparency evaluations were examined by two-tailed t-tests to define the levels of significance.

Results and Discussion

Fairness and transparency of the direct PFES program

The results of the fairness and transparency evaluations regarding their importance and implementation are presented in **Table 5**.

Table 5 shows that most of the fairness criteria (seven out of eight criteria) were perceived as strongly important, with the mean scores ranging from 4.04 (F2) to 4.62 (F4); only the F2 criteria received a mean score at the

Table 2. Basic characteristics of the interviewees

No.	Interviewee characteristics	Amount (number of persons)	Ratio (%)
1	Sex		
1.1	Male	98	58.7
1.2	Female	67	41.3
2	Ethnic composition		
2.1	Tày	81	48.5
2.2	Nùng	34	20.4
2.3	Dao	42	25.1
2.4	Kinh	3	1.8
2.5	Other	7	4.2
3	Education level		
3.1	Illiterate	10	6.0
3.2	Primary	16	9.6
3.3	Secondary	54	32.3
3.4	High school	62	37.1
3.5	University or college	25	15.0
4	Economic conditions		
4.1	Poor	45	26.9
4.2	Not poor	122	73.1

Table 3. Criteria of fairness and transparency

Unit	Code	Criteria
Fairness	F1	Guarantee participation opportunities for all people
	F2	Guarantee participation opportunities for females
	F3	Guarantee participation opportunities for poor people
	F4	Set up an appropriate price for the service
	F5	Guarantee the participation of all stakeholders in negotiating the payment rate
	F6	Guarantee equality in sharing benefits
	F7	Clearly defining the responsibilities of all stakeholders
	F8	The duties of stakeholders are clearly distributed
Transparency	T1	Transparency of information
	T2	Transparency of operation principles
	T3	Transparency of stakeholders' benefits and accountability
	T4	Providing adequate information
	T5	Establishment of a monitoring mechanism system

important level. Otherwise, the mean scores of the transparency criteria were slightly higher, ranging from 4.28 (T5) to 4.47 (T3) for all criteria, which means respondents considered these criteria to be strongly important in a PFES program. Statistical analyses also pointed out that the standard deviation values were relatively low (0.5 to 0.75), presenting the consistency of

Table 4. Evaluation scale of fairness and transparency

Level	Ranking points	Range	Level classification	
			Importance	Implementation
Level 1	1	1.00-1.80	Strongly not important	Not implemented
Level 2	2	1.81-2.60	Not important	Poor
Level 3	3	2.61-3.40	Moderately important	Acceptable
Level 4	4	3.41-4.20	Important	Good
Level 5	5	4.21-5.00	Strongly important	Excellent

Table 5. Importance and implementation of fairness and transparency of the direct PFES program in Ba Be District, Vietnam

Criteria	Direct program (n = 57)					
	Importance			Implementation		
	Ranking	Mean ± SD	Level	Ranking	Mean ± SD	Level
			Fairness			
F1	3	4.38 ± 0.57	Strongly important	2	3.79 ± 1.08	Good
F2	8	4.04 ± 0.62	Important	1	3.96 ± 0.55	Good
F3	3	4.38 ± 0.64	Strongly important	5	3.64 ± 1.19	Good
F4	1	4.62 ± 0.53	Strongly important	8	2.96 ± 1.07	Acceptable
F5	5	4.34 ± 0.52	Strongly important	7	3.00 ± 0.88	Acceptable
F6	2	4.57 ± 0.50	Strongly important	4	3.68 ± 0.93	Good
F7	7	4.23 ± 0.73	Strongly important	6	3.45 ± 0.85	Good
F8	6	4.32 ± 0.59	Strongly important	2	3.79 ± 0.83	Good
			Transparency			
T1	2	4.45 ± 0.75	Strongly important	2	3.72 ± 1.06	Good
T2	4	4.40 ± 0.58	Strongly important	1	3.79 ± 0.88	Good
T3	1	4.47 ± 0.62	Strongly important	4	3.40 ± 0.99	Good
T4	3	4.43 ± 0.58	Strongly important	3	3.55 ± 1.04	Good
T5	5	4.28 ± 0.68	Strongly important	5	3.21 ± 0.98	Acceptable

Note: SD = Standard deviation; Bolded values are the highest and lowest rankings.

the community's opinions. The standard deviation values to assess the importance of the criteria were relatively low, ranging from 0.5-0.73 and 0.58-0.75 for the fairness and transparency criteria, respectively. This shows a great similarity in the assessment results of the people participating in the PFES program in Ba Be. In fact, for ethnic minority communities with high community cohesion, ensuring fairness among members and publicizing community activities are key factors in maintaining the sustainability of the community (Vien *et al.*, 2016). Therefore, it is understandable that people appreciate the importance of the fairness and transparency criteria in the PFES program.

In terms of implementation, the fairness criteria received a wide range of scores, from 2.96 (F4) to 3.96 (F2), and the mean scores of the transparency criteria were from 3.21 (T5) to 3.79 (T2). According to the results, six out of the eight fairness criteria ranked at a good level in the PFES implementation progress, and the other

two criteria ranked at an acceptable level. The performance of transparency had a similar evaluation, four out of the five criteria had good performance, and only one criterion was evaluated at an acceptable level according to the community's opinions. Standard deviation values of the community's opinions in terms of implementation were relatively high (ranging from 0.55 to 1.19 for fairness and from 0.88 to 1.06 for transparency). These values show the significant differences in the community's opinions. The large variation in the evaluations of the fairness and transparency performances once again shows that the perception of fairness was very different from person to person (Pascual *et al.*, 2010). For example, it is reasonable for people to pay an equal amount for 1 hectare of protected forest. However, agencies and organizations (national parks and forest enterprises) think that equal payments are not reasonable for different quality forests (Pham *et al.*, 2003; Muradian *et al.*, 2010; Tacconi, 2012).

Fairness and transparency of the indirect payment program

State institutions (Bac Kan Forest Protection Fund) are representative of service consumers in the trading system of the indirect program. Thus, the study only focused on investigating the opinions of service providers about the fairness and transparency of the indirect PFES program. **Table 6** presents the summary of the results.

In **Table 6**, the values of the fairness criteria range from 3.65 (F2) to 4.1 (F4), which shows that the service providers all perceived the importance of fairness in PFES progress. Similarly, the mean scores of the transparency range also pointed out the importance of these criteria in the community's perceptions (ranging from 3.95 to 4.07). The data showed the consistency of the community's opinions via the low standard deviation values, which were from 0.68 to 0.92 and 0.79 to 0.91 for fairness and transparency, respectively.

Otherwise, the implementation of the indirect payment program had lower scores regarding the fairness and transparency criteria. There were six out of eight criteria of fairness ranked at an acceptable level, and two out of the five transparency criteria (T4 and T5) ranked at the same level. The rest of the criteria were evaluated as having good performance. The opinions of the community were quite inconsistent, as presented through the high standard deviation values (ranging from 0.6 to 1.13 and from 0.83 to 1.06 for fairness and transparency, respectively).

Comparing the assessments of fairness and transparency of the providers and buyers in the direct program

The study only compared the evaluation results of buyers and providers of the direct payment programs (**Table 7**). The buyers of the indirect payment program were not directly involved in the payment system and were represented by state institutions; thus, we did not cover this group in our investigation.

Fairness

Buyers and sellers were slightly different in some of their perceptions. According to the sellers, the most important criterion of fairness was the F6 criterion, which was equality in sharing benefits. Nevertheless, the buyer's most important criterion was F4, which was related to an appropriate service price. These results could be explained by the differences in their economic preferences. The service sellers are always concerned about the fairness of sharing benefits among the community. In contrast, the buyers pay particular attention to the price of the service because it affects their financial source. The study found no differences in the stakeholders' perceptions of other criteria. Of note, the mean score of criterion F2, which was promoting the participation of females in the PFES progress, received the lowest score of both groups. This result presents that gender equality to sustain fairness was the lowest concern of stakeholders in the PFES program.

Evaluation results of fairness's performance also had some dissimilarities between the buyers and sellers. Twenty-nine households of Duong hamlet highly evaluated criterion F1, which aims to promote the participation of all stakeholders. As per their claims, all the households had

Table 6. Importance and implementation of fairness and transparency of the indirect PFES program in Ba Be District, Vietnam

Criteria	Importance			Implementation		
	Ranking	Score (Mean ± SD)	Level	Ranking	Score (Mean ± SD)	Level
Fairness						
F1	5	3.97 ± 0.68	Important	3	3.33 ± 0.93	Acceptable
F2	8	3.65 ± 0.92	Important	4	3.32 ± 0.76	Acceptable
F3	3	4.01 ± 0.67	Important	1	3.41 ± 0.60	Good
F4	1	4.10 ± 0.86	Important	5	3.25 ± 0.92	Acceptable
F5	2	4.02 ± 0.68	Important	8	3.09 ± 1.10	Acceptable
F6	4	4.00 ± 0.78	Important	5	3.25 ± 1.13	Acceptable
F7	6	3.87 ± 0.84	Important	1	3.41 ± 0.80	Good
F8	7	3.74 ± 0.85	Important	5	3.25 ± 0.96	Acceptable
Transparency						
T1	1	4.07 ± 0.79	Important	2	3.43 ± 0.83	Good
T2	2	4.00 ± 0.79	Important	2	3.41 ± 1.03	Good
T3	3	3.99 ± 0.83	Important	1	3.44 ± 1.01	Good
T4	5	3.95 ± 0.91	Important	4	3.24 ± 1.03	Acceptable
T5	4	3.96 ± 0.83	Important	5	3.19 ± 1.06	Acceptable

Note: SD = Standard Deviation; Bolded values are the highest and lowest rankings.

participated in the PFES program and had equal benefits. However, they claimed the poor performance of criterion F5 because they had little power in deciding the service price. For the buyers, F2 was the highest criterion while implementing PFES because women played the role of money keepers for most households, and they were representatives of the households to pay money; thus, they had a chance to participate in PFES. In the buyers' opinion, the lowest scores for the implementation of fairness belonged to criteria F3 and F4. They claimed that poor households were excluded from the money payment system (only businessmen and boatmen had to pay for using the service). Of note, they showed their concern about service quality, and they thought they were paying an inappropriate price for this service even though most of them claimed their weakness in the service quality evaluation.

Transparency

The results point out that criterion T1 was the most important with service buyers. The transparency of information was perceived as the main factor deciding the participation opportunities and benefits of the sellers. Nevertheless, the buyers thought criteria T3 and T4 were crucial. According to their opinions, the specific responsibilities of each stakeholder, especially the accountability of service providers after receiving the payment, were very important. On the other hand, adequate information about all activities of the PFES progress should be announced to all stakeholders, especially the information of financial distributions and the activities of the intermediary institutions. This information helped buyers ensure the effectiveness and transparency of their investments.

All stakeholders had similar opinions in giving the lowest score for criterion T5. In fact, this PFES program did not have an effective monitoring system to monitor the activities of both buyers and sellers. As the Vietnam Administration of Forestry (VNFOREST) (2015) claimed in their report, this was a common issue

Table 7. Importance and implementation of fairness and transparency of the direct PFES program in Ba Be District, Vietnam

Code	Important				Implementation			
	Provider (n = 29)		Buyer (n = 28)		Provider (n = 29)		Buyer (n = 18)	
	Ranking	Mean ± SD	Ranking	Mean ± SD	Ranking	Mean ± SD	Ranking	Mean ± SD
Fairness								
F1	4	4.41 ± 0.57	5	4.35 ± 0.59	**1**	4.22 ± 0.70***	**5**	3.0 ± 1.24***
F2	**8**	4.00 ± 0.68	**8**	4.10 ± 0.55	3	4.04 ± 0.52	**1**	3.85 ± 0.59
F3	3	4.48 ± 0.58	7	4.25 ± 0.72	2	4.15 ± 0.72***	7	2.95 ± 1.36***
F4	2	4.63 ± 0.49	**1**	4.60 ± 0.60	**7**	2.96 ± 1.16	7	2.95 ± 0.97
F5	6	4.22 ± 0.51*	2	4.50 ± 0.51*	**8**	2.93 ± 1.00	6	3.10 ± 0.72
F6	**1**	4.67 ± 0.48	3	4.45 ± 0.51	5	3.85 ± 0.95	4	3.45 ± 0.89
F7	7	4.15 ± 0.82	5	4.35 ± 0.59	6	3.41 ± 0.93	3	3.50 ± 0.76
F8	5	4.26 ± 0.66	4	4.40 ± 0.50	4	3.93 ± 0.78	2	3.60 ± 0.88
Transparency								
T1	**1**	4.59 ± 0.50	5	4.25 ± 0.97	**1**	4.19 ± 0.68***	3	3.10 ± 1.17***
T2	3	4.44 ± 0.51	3	4.35 ± 0.67	2	4.07 ± 0.78***	**1**	3.40 ± 0.88***
T3	2	4.52 ± 0.58	**1**	4.40 ± 0.68	**4**	3.63 ± 0.97*	3	3.10 ± 0.97*
T4	3	4.44 ± 0.58	**1**	4.40 ± 0.60	3	3.85 ± 0.91**	2	3.15 ± 1.09**
T5	**5**	4.26 ± 0.71	4	4.30 ± 0.66	**5**	3.37 ± 0.97	**5**	3.00 ± 0.97

*Note: *, **, and *** indicate the significance levels of 10%, 5%, and 1%, respectively; SD = Standard deviation; Bolded values are the highest and lowest rankings.*

in many PFES programs implemented in Vietnam. Excepting monitoring system problems, the service buyers highly evaluated the transparency of information (T1). They all received the information about community meetings related to PFES. In addition, the service sellers also thought the PFES program presented a good performance in terms of transparent operation principles of the PFES (T2). All operation principles were clearly defined in the business contract, which was signed between the buyers and sellers.

Comparison of fairness and transparency between the direct and indirect PFES programs

In comparison, the results of the fairness and transparency evaluations of the direct payment programs were generally higher than the results of the indirect programs (**Figures 3** and **4**). This could be the consequence of the implementation scale of both programs. The direct PFES was implemented at a small pilot scale. Thus, it was easier to monitor the operational activities. Both buyers and sellers had a chance to participate in negotiating the service price, the operation principles of mechanism, the responsibility of stakeholders, and other related information.

On the other hand, to exchange information, the indirect program needed a third party, the Forest Protection and Development Fund (only at the State and provincial levels). Therefore, information could not be directly transferred to the large number of participants, and the effectiveness of fairness and transparency were also reduced. Better performance in terms of fairness and transparency of small-scale PFES and direct payment programs have been the conclusions of the studies of many researchers (Kolstad & Wiig, 2009; Muradian *et al.*, 2010).

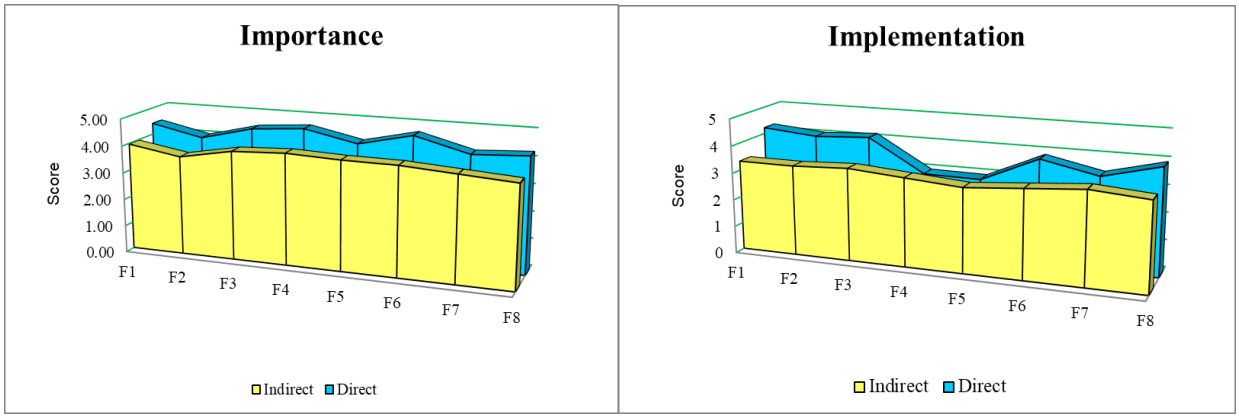

Figure 3. Comparison of the importance and implementation of fairness of the direct and indirect PFES programs in Ba Be district

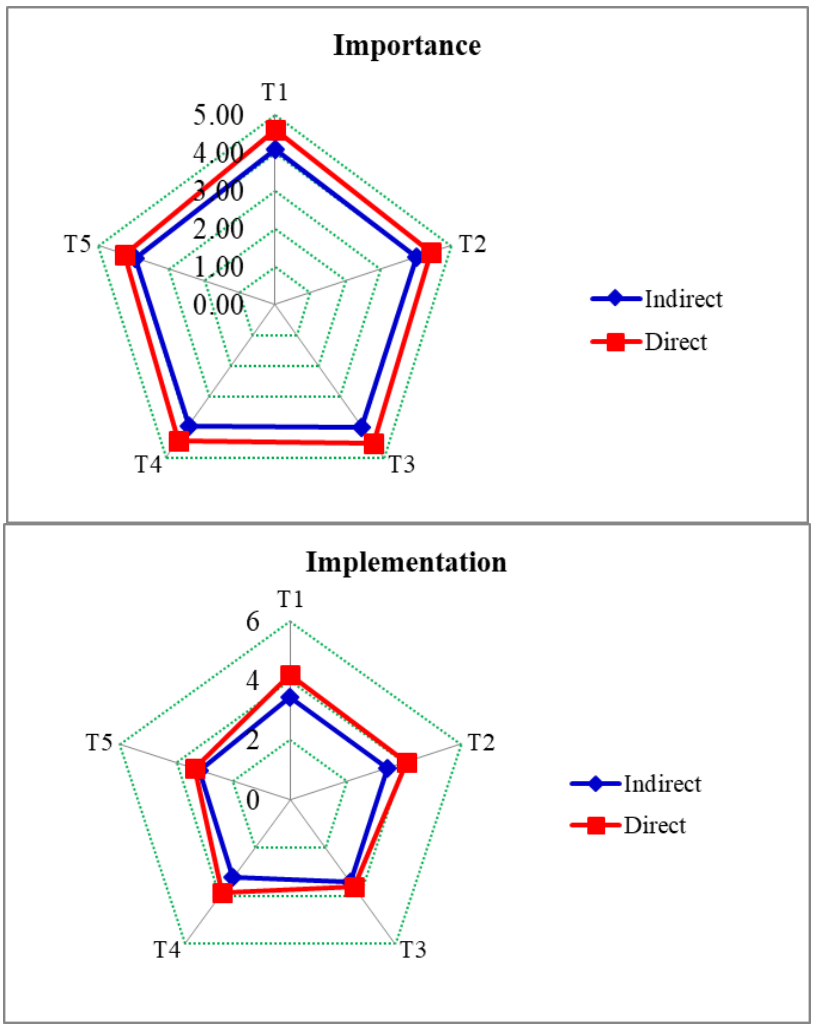

Figure 4. Comparison of the importance and implementation of transparency of the direct and indirect PFES programs in Ba Be district

Conclusions

The research results showed that people strongly agreed that fairness and transparency should be included in both direct and indirect payment programs for forest environmental services, with assessments ranging from the important to very important levels. However, the evaluations of the implementation of the fairness

and transparency criteria were lower than the assessments of their importance, with the ratings ranging from the acceptable to good levels. It is recommended that managers continue to include fairness and transparency criteria in the design and evaluation of forest environmental services payment programs. In addition, it is necessary to take measures to improve fairness and transparency in the process of implementing the forest environmental service programs in our country in the future.

The difference between the evaluations on the importance of fairness and transparency of the buyers and service providers were not significant in the direct PFES programs, except criteria F5. On the contrary, the perspectives on implementing fairness and transparency between the users and sellers were significantly different at two criteria of fairness (F1 and F3) and four criteria of transparency (T1, T2, T3, and T4). In general, the service providers' scores for all the criteria of fairness were higher than users'.

The community's evaluations of the importance and implementation of fairness and transparency in the direct PFES program were overall higher than the indirect PFES program. The results clarified that a small scale of PFES had better performances in implementing fairness and transparency compared to a larger scale. The fairness and transparency evaluations played important roles in assessing the performance of the PFES programs. However, they have not been implemented in Vietnam. Based on the findings of the study, we suggest that local authorities and related institutions should take these criteria into account in designing an evaluation program for PFES programs in the future.

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References

Bennett M. T. (2008). China's sloping land conversion program: institutional innovation or business as usual? Ecological Economics. 65(4): 699-711. DOI: 10.1016/j.ecolecon.2007.09.017.

Coase R. H. (1960). The problem of social cost. Journal of Law and Economics. 3: 1-44.

Dung N. V. (2015). PFES and opportunities for implementing forest co-management in Vietnam. Proceedings of the workshop on: Evaluating the effectiveness of payment for forest environmental services and the participation of local stakeholders. Hanoi. November 20, 2015: 41.

European Climate Exchange (2008). About ECX. European Climate Exchange. London. Retrieved from http://www.ecx.eu/About-EXC on January 2, 2021.

Engel S., Pagiola S. & Wunder S. (2008). Designing payments for environmental services in theory and practice: an overview of the issues. Ecological Economics. 65(4): 663-674. DOI: 10.1016/j.ecolecon.2008.03.011.

General Statistics Office in Vietnam (2020). Bac Kan Statistical Yearbook 2019. Statistical Publishing House. Hanoi (in Vietnamese).

Bao Huy (2009). Building a benefit mechanism in community forest management. Proceedings of the National Workshop on Community Forest Management. Hanoi (in Vietnamese).

Kolstad I. & Wiig A. (2009). Is transparency the key to reducing corruption in resource rich countries?. World Development. 37(3): 521-532.

Landell-Mills N. & Porras I. (2002). Silver Bullet or Fools' Gold? A Global Review of Markets for Forest Environmental Services and Their Impact on the Poor International Institute for Environment and Development. London.

Loft L., Le D. N., Pham T. T., Yang A. L., Thajadi J. S., Wong G. Y. (2017). Whose equity matters? National to local equity perceptions in Vietnam's Payments for forest ecosystem services scheme. Ecological Economics 135: 164-175.

Tacconi L. (2012). Redefining payments for environmental services. Ecological Economics. 73: 29-36. DOI: 10.1016/j.ecolecon.2011.09.028.

Mc Leod S. A. (2008). Likert scale. Retrieved from https://www.simplypsychology.org/likert-scale.html on May 5, 2020.

Muradian R., Corbera E., Pascual U., Kosoy N. & May P.H. (2010). Reconciling theory and practice: an alternative conceptual framework for understanding payments for environmental services. Ecological Economics. 69(6): 1202-1208. DOI: 10.1016/j.ecolecon.2009.11.006.

Muñoz-Piña C., Guevara A., Torres J.M. & Braña J. (2008). Paying for the hydrological services of Mexico's forests: analysis, negotiations and results. Ecological

Economics. 65(4): 725-736. DOI: 10.1016/j.ecolecon.2007.07.031.

Mulgan R. (2000). Accountability: an ever-expanding concept? Public Administration.78(3): 555-573.

Ngai N. B. (2016). Speech at the Summary Conference on Payments for Environmental Services in Vietnam. Proceedings of the Workshop: Evaluation of the effectiveness of payment for forest environmental services and the participation of local stakeholders, Hanoi on November 20, 2015 (in Vietnamese).

Pagiola S. & Platais G. (2007). Payments for Environmental Services: From Theory to Practice. World Bank. Washington.

Pagiola S. (2008). Payments for environmental services in Costa Rica. Ecological Economics. 65(4): 712-724. DOI: 10.1016/j.ecolecon.2007.07.033.

Pascual U., Muradian R., Rodríguez L. C., Duraiappah A. (2010). Exploring the links between equity and efficiency in payments for environmental services: a conceptual approach. Ecological Economics. 69(6): 1237-1244.

Pham T. T., Bennet K., Vu T. P., Brunner J., Dung L. N. & Nguyen D. T. (2003). Payments for forest environmental services in Vietnam: From policy to practice. CIFOR (Bogor, Indonesia) Occasional Paper 93.

Stavins R. N. (1998). What can we learn from the Grand Policy Experiment? Lessons from SO_2 allowance trading. Journal of economic perspectives. 12(3): 69-88. Retrieved from https://www.researchgate.net/publication/4981571_What_Can_We_Learn_from_the_Grand_Policy_Experiment_Lessons_from_SO2_Allowance_Trading on May 12, 2021.

Government of Socialist Republic of Vietnam (2010). Decree No. 99/2010/ND-CP on "Payment for forest environmental services". Retrieved from http://vanban.chinhphu.vn on September 20, 2020 (in Vietnamese).

Vien T. D., Son C. T., Dung N. T. T. D. & Lam N. T. (2016). Chapter 5: A voluntary model of payments environmental services: Lessons from Ba Be district, Bac Kan province of Vietnam. In: Thanh M. V., Vien D. T., Stephen J. L. & Ganesh P. S. (Eds.). Redefining diversity and dynamics of natural resource management in Asian. Elsevier Publishing.

Vietnam Forest Protection and Development Fund (2016). Report on the implementation of the policy on payment for forest environmental services. Hanoi, Vietnam.

Vietnam Administration of Forestry (2015). Report on: Evaluating the effectiveness of payment for forest environment services and the participation of local stakeholders. Hanoi. November 20, 2015.