

Local perspectives on drivers of deforestation and degradation and effectiveness of financial incentive mechanisms in Bach Ma National Park

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Abbreviations

BMNP	Bach Ma National Park
CPC	Commune People's Committee
DCDC	Resettlement program
FGD	Focus Group Discussion
FPD	Forest Protection Department
FPDF	Forest Protection and Development Fund
HHs	Households
M&E	Monitoring and Evaluation
NP	National Park
NTFPs	Non-timber Forest Products
PA	Protected Area
PES	Payment for Environmental Service
PFES	Payment for Forest Environmental Services
SFEs	State Forest Enterprises
USAID	United States Agency for International Development
VND	Vietnam Dong
WWF	World Wildlife Fund

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1 Introduction

Vietnam is within the Indo-Burma Biodiversity Hotspot and is ranked as the 16th most biodiversity rich country in the world (De Queiroz 2013). However, this is threatened by illegal wildlife trade (Mott 2006) and logging (Pham et al. 2012; To et al. 2016). Like many other countries in the world, biodiversity conservation is safeguarded by protected areas (PAs) and a National Park (NP) system in Vietnam; yet biodiversity continues to decline leading to questions and the need to enhance PA effectiveness (De Queiroz 2013; Coad et al. 2015; Barnes et al. 2017).

The literature to date on PA effectiveness has highlighted an important yet understudied factor: how to design a suite of policy instruments to enhance local participation and promote conservation behavior in local people (Cetas and Yasué 2017). As PAs often have a strong impact on local livelihoods (Karki 2013; Bennett and Dearden 2014), understanding local people's perceptions of their living conditions is important to understanding local acceptance of NPs (Puntscher et al. 2017). Coad et al. (2015) argued that understanding the merits of specific types of policy instruments is not enough for policy refinement but needs to be coupled with a good understanding of how different motivators are embedded in specific contexts, to better empower local communities to commit to biodiversity conservation. However, drivers that explain local participation remain unclear and few studies have attempted to understand the motivations behind involvement (or lack thereof) in different conservation initiatives or have considered the perspective of the local stakeholder (Méndez-López et al. 2015). Three oft-cited major motivations that influence participation in environmental policies and payment for environmental services (PES) schemes in Vietnam are laws and policies, economic incentives, and social and cultural of motivations (Pham et al. 2009; 2013; 2014; Barnes et al. 2017). While many studies have analyzed the first two factors, few studies to date have adopted a psychological approach to understanding local motivational values to conservation in PAs, particularly in Vietnam. Furthermore, while most conservation programs and financial incentives mechanism, including PES, focus on effectiveness and efficiency (Kerr et al. 2017), few studies have considered social dimensions and how local perceptions of equity influence PES payment distribution (Pham et al. 2014; Loft et al. 2017; Wong et al. 2017).

Using Bach Ma National Park (BMNP) as a case study, this paper aims to address these gaps by exploring the effectiveness and equity of different financial incentive mechanisms. BMNP was set up in Thua Thien Hue province in 1991 to conserve the last corridor of forest stretching from the East Sea to the Annamite Mountain Range. Despite its strategic role as a critical conservation priority area in Vietnam, the NP is under pressure from both provincial and socioeconomic development. This paper analyzes how conservation programs and financial incentives mechanism could be more effective and equitable in BMNP.

This paper is structured in eight parts. After the introduction, the methods used are presented in the second section. In the third section, the importance of forests based on local perceptions is discussed. In the fourth section, drivers of deforestation, degradation and biodiversity loss as defined by local people and NP managers are presented. Section 5 reviews the financial incentive mechanism (FIMs) for forest protection and development that have been introduced since 1991. The Payment for Forest Environmental Services (PFES) scheme, which started in 2015, is discussed in section 6. Section 7 considers how equity plays out in both policy and practice, and discusses several policy implications for effective management of the NP. Section 8 concludes the paper.

2 Methods

A wide range of methods was employed in this research.

2.1 Literature review

Government reports on policy performance, scientific reports and journal articles on BMNP were reviewed to provide a general understanding of the institutional setting and implementation status of different incentive mechanisms in the studied area.

2.2 Informant interviews

Interviews with three village heads were conducted to obtain an overall understanding of the policy instruments in place and their views towards policy effectiveness.

2.3 Focus group discussions

Focus group discussions (FGDs) were conducted with National Park Management Board (5 senior staff members), with 20 heads and deputy heads of villages in Phu Loc District and with 21 heads and deputy heads of villages in Nam Dong district in November and December 2017. Topics covered during these FGDs included: the role and importance of forests in local livelihoods, drivers of deforestation, degradation and biodiversity loss in the area, the policies and financial incentives mechanisms in place and their pros, cons, opportunities and threats, and how to improve these schemes.

2.4 Household surveys

These were conducted with 33 households in Thuong Lo and Huong Loc communes, Nam Dong district in September 2017. In Nam Dong district, there are two main ethnic groups, Kinh and Ko Tu. Kinh accounts for 48.5% and Ko Tu comprise 51.5%. The household survey covered a wide range of topics including: involvement in forest protection and PFES; pros and cons of different FIMs including PFES; payment distribution processes and outcomes; monitoring and evaluation of PFES and non-compliance with PFES.

3 Stakeholders' perceptions on the role and importance of forests in local livelihoods

The household survey results show that forestry makes a significant contribution to household income (Figure 1, Table 1).

The results from FGDs showed that forestry and its resources help to generate cash income and also provide food, commercial products, and materials for cooking and building houses (Table 1), as well as providing other environmental services such as climate regulations (Figure 2).

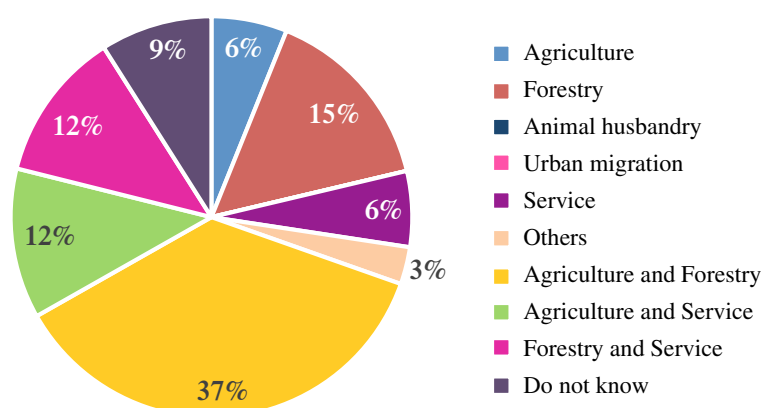


Figure 1. Main income sources of households surveyed.

Table 1. Role and importance of forests.

	Forest products	Sources	Frequency
Food	bamboo, rattan, banana, forest fruits, forest seeds (<i>Uoi, May</i>), snails, fish, frogs, wild pigs, snakes, mice	buffer zone, production forest, natural forest, stream	very frequent (weekly)
Selling to local market	honey, mushrooms, Non leaf, medical plants	natural and old forest	frequent (monthly)
Materials for cooking	firewood	production forest, acacia plantation	very frequent (weekly)
Building houses	timber	natural forest, community forest	only in the past

Source: FGDs results 2017

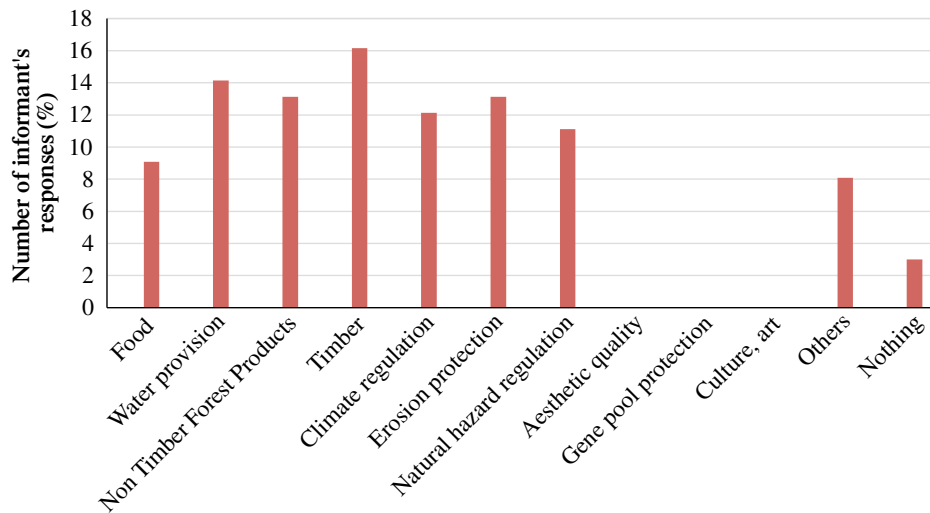


Figure 2. Benefits gained from forest protection in addition to the PFES payment.

Source: Household survey (2017)

Our findings are consistent with previous studies conducted by Nguyen (2015) and Nguyen and Nguyen (2016) where the authors found that major forests products offered for sale in the area studied in 2015 were rattan (51.8%), honey (19.2%), Linh Chi mushrooms and wild boar (8%). Local people search for these products for 2–3 times per year. A previous study conducted by Bayrak et al. (2014) also shows a wide range of benefits that local people obtain from both natural and community forests, although community forests have fewer benefits.

Moreover, 432 of the approximately 1400 described species in the park are used by the local population for a variety of medicinal purposes (Tran and Ziegler 2001). However, our FGD conducted in Phu Loc district indicated that local knowledge of medical plants has been gradually eroded.

The FGDs and participatory mapping results show that local people are actively harvesting forestry products in the prohibited zone of the NP (Figure 3), despite government restrictions on accessing and harvesting forestry products in the NP’s core zone. This is because of the products’ importance for daily subsistence and local livelihoods.

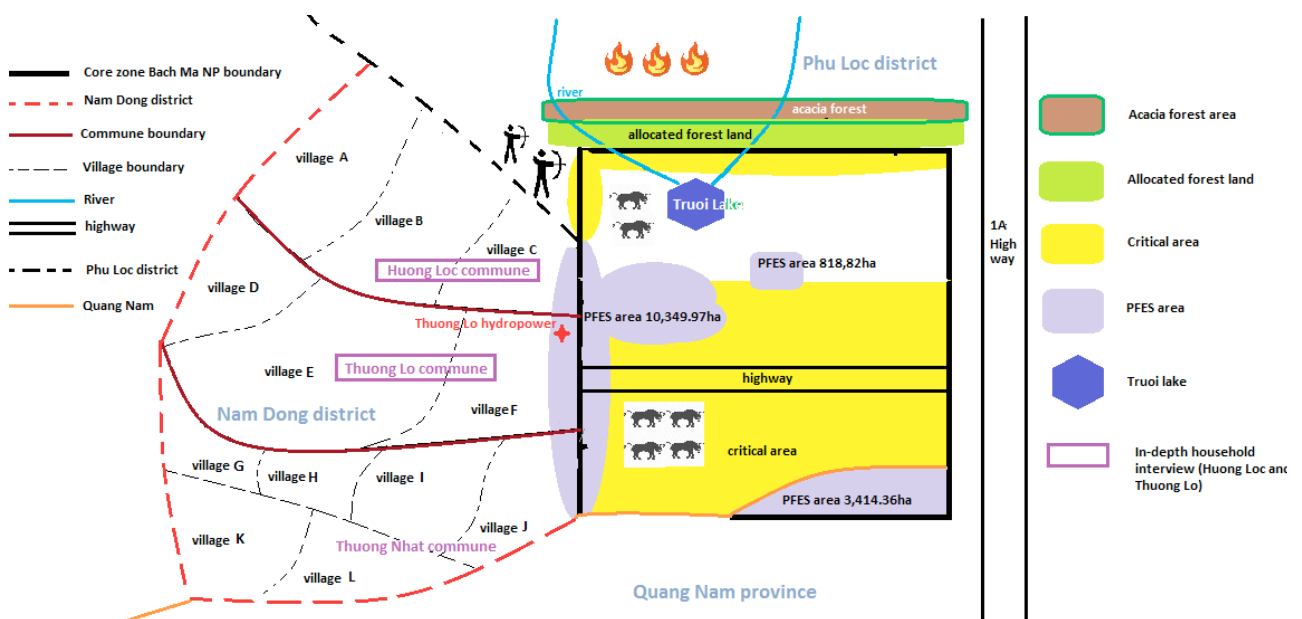


Figure 3. Participatory mapping of studied sites done during three FGDs.

4 Drivers of deforestation, degradation and biodiversity loss

A clear understanding of the drivers of biodiversity loss is necessary to develop appropriate policies and measures (Barnes et al. 2017).

The findings from both FGDs and the household survey show that BMNP is under high pressure. According to the BMNP management group interviewed, the number of violations, including illegal logging and poaching, trapping and hunting increased from 39 cases in 2016 to 50 cases in 2017. Fines totaling VND 53.3 million were issued in 2017. Among all buffer zone districts, Nam Dong, including Huong Loc, Thuong Lo and Thuong Nhat communes, has the most intensive illegal logging and forest disturbance. According to the FGD findings, illegal logging and hunting are still widespread in two districts surveyed. FGD participants in Phu Loc district also asserted that although the number of deforestation cases decreased, their scale and impact increased.

Table 2. Drivers of deforestation, degradation and biodiversity loss.

Bach Ma National Park	Phu Loc District	Nam Dong District
1. Illegal logging and high demand for both timbers and non-timber forest products (NTFPs)	1. Illegal logging	1. Infrastructure development: hydropower plants and road construction
2. Weak law enforcement and inconsistent policies	2. Lack of stable income sources and occupations	2. Farming expansion and acacia expansion
3. Illegal hunting and encroachment	3. Floods	3. Illegal logging in the NP for housing and provincial furniture retailers
4. High poverty rate and economic growth pressure	4. Limited understanding of local people on the role of forests	4. Floods
5. Infrastructure development: hydropower plants and road construction (La Son and Tuy Loan highway)	5. In the last 10 years, fire has occurred in plantations, not natural forests (caused by honey bee collection)	5. Poaching and traps
6. Grazing	6. Before 2000, forests were not allocated to local people for protection -> lack of local ownership	6. Shifting cultivation
7. NP prioritizes addressing illegal logging above hunting, lack of funding, safety issues	7. Poaching	
	8. Weak law enforcement	

Note: The participants were asked to identify and rank the importance of each driver.

Source: FGDs results 2017

According to the NP officers interviewed, illegal loggers are fully equipped and “*We put the camera to track them – they put camera to track us.*” Challenges for BMNP management, as identified by BMNP officers during FGDs and interviews, in implementing forest protection activities also include:

- Small number of forest rangers compared with a large of forest areas that needs to be protected.
- Lack of clear incentives for park rangers and local forest patrol groups to enforce laws on hunting and poaching. For example, a few years ago, awards were given to park rangers and local forest patrol groups if they found and removed traps in the forests. However, these reward schemes ended leading to a reduction of interest and enthusiasm for removing traps.

Findings from FGDs conducted with BMNP rangers and local people in two districts show that drivers of deforestation, degradation and biodiversity loss are quite diverse ranging from development pressure and economic opportunities, to governance failure in implementing conservation programs (Table 3). In addition, 14.752 ha of special-use forest area had been converted for a new road from La Son to Tuy Loan according to Decision No 1496/TTg-NN dated 2nd October 2017 of the Prime Minister. These drivers are also commonly understood by stakeholders, suggesting broad support for the common problems that need to be addressed.

Table 3. Distribution of state investment in BMNP, 2001–2006 (%).

National park	:	Bach Ma
Investment for regular park activities	:	42.76
661 program	:	15.72
Investment from other projects	:	41.53
Total investment	:	100.00

Source: Ha and Niekdam (2008)

5 Policies and measures for Drivers of Deforestation and Degradation: Financial Incentive mechanisms

Different incentive mechanisms have been piloted and implemented in BMNP and its buffer zone area since 1993. These mechanisms are built upon each other and it is therefore difficult to identify and measure the additionality of each program. There is also no monitoring and evaluation that provides scientific evidence on the environmental and social impacts of those programs. The behavior of local people neighboring the NP might not be influenced by one individual program but in fact by multiple programs. Each of these incentive schemes also offers a set of lessons that need to be taken into account for effective policy implementation for the park. This section focuses on reviewing lessons learnt from previous incentive mechanisms, while the next section will focus on the current PFES scheme, which has not been studied in depth in BMNP.

5.1 Program 661

Between 2001 and 2006, BMNP implemented Program 661 with the objective of protecting natural forests, reforesting marginal areas, minimizing the impacts of local people and preventing forest fires. The afforestation Program 661, which involves 28 communes along the province’s coastline, lagoons and marshes, provides saplings to be planted across 4600 ha of land (*Viet Nam News* 2011) and payment for labor costs, but has no clear monitoring and evaluation (M&E) protocol. Program 661 was implemented by both BMNP and State Forest Enterprises (SFEs) through contracting local people. Between 2001 and 2006, the program accounted for more than 15% of the total state budget investment for forest protection activities in the BMNP (Table 4).

Table 4. Timeline since NP was established.

Time	Event
1991	Bach Ma National Park was established under decision 214-CT; three sub-zones with an area of 3262 ha were categorized into special-use forest aiming primarily at ecological restoration of this area.
Before 1993	Thuong Lo commune only had draft land-use planning.
1993	The Resettlement (DCDC) Program was carried out.
After 1993	Forestry land was temporarily allocated to farmers for forest planting under the DCDC Program. The total area allocated was 95 ha. 1993: 26.7 ha/53 households 1994: 26.7 ha/61 households 1995: 40.7 ha/78 households Protection forest: The Thuong Lo commune had five sub- zones under critical Huong river watershed protection with a total area of 6039.1 ha, four of which are under the management of the Nam Dong Forest Enterprise (4071 ha) and the rest is managed by the commune (968 ha). Production forest: There was only one sub-zone with an area of 1034.9 ha managed by the Nam Dong Forest Enterprise. Additionally, the commune had a buffer zone with an area of 2729.5 ha (the Nam Dong Forest Enterprise manages 2098 ha and the commune manages 640.5 ha).
2008	Bach Ma National Park was expanded under decision 01/QĐ-TTg by 37,487 ha

According to CRD et al. (2012), forestland allocation to households started in Nam Dong district in 1998, while allocation of production forests to communities only started in 2005. In addition to forest allocated to individual households to manage, households are also contracted by Nam Dong Protection Forest Management Board. However, the number of households contracted and the forest area they manage are relatively small (eight households managing only 1400 ha). Overexploitation of forests occurs in both production and watershed protection forests. Nam Dong Forest Protection Department (2011) reported 48 violations in the area, with 87,493 m³ of round wood illegally logged (CRD et al. 2012).

Forest planted under Program 661 is often in swidden areas where customary rights belong to ethnic groups. Although these ethnic and swidden communities have traditionally used the area to grow crops, their customary rights are not recognized by the State and therefore forest plantations in their areas are managed by SFEs. Program 661 forest plantations started in 2002 when SFEs provided seedlings, fertilizer and finance for forest protection labor costs. However, once the forests were planted, both the land and forests belonged to SFEs and people were forbidden access to forest. According to Nguyen (2015) and Nguyen and Nguyen (2016), this raised conflicts between local people and SFEs for several reasons. Local people were moved from land harvested by SFEs before the SFEs recognized customary law as local ownership. As a result, local people expect the SFEs to give an equal share of the benefits to local people, although the benefits currently go to SFEs only. SFEs are exploring natural forests without consulting local villagers. They should also compensate local people for damage to land and soil caused by logging activities.

Program 661 forests are planted and managed by local people and they are allowed to harvest timber in these forests. However, due to the lack of cultivated land, local people asked the provincial government to take back these forestlands and convert them to agricultural land; this has been approved by the Provincial People's Committee. The benefit-sharing ratio between local people and the commune after harvesting timbers is 70:30 (Nguyen 2015; Nguyen and Nguyen 2016). The rules for harvesting and selling timber from Program 661 plantations also have limitations, which make local people less willing to participate in the forestry scheme. For example, to harvest timber, people have to submit a harvesting plan and also measurable quotas in cubic meters, which is considered to be impossible by local people as they sell standing trees and have limited knowledge and experience of measuring these. In fact, because of this limited knowledge, local people allow brokers to act on their behalf, preparing and submitting the harvesting plan to local authorities in their names. Moreover, there are large areas of forests planted by local people on land they have cleared themselves since 1970, but these forests and lands are not formally recognized by law and, as a result, cannot be recognized as legal timber to sell.

5.2 Decree 01/2000

Since the establishment of NP in 1991, several land allocation activities (e.g. Decree 01/2000 and DCDC program) and land-use changes have been carried out. On 4 January 1995, the government issued Decree 01/2000 on the allocation of land through contracts for agriculture, forestry and aquaculture. According to this decree, individuals, households and groups of households are eligible for long-term contracts with State organizations. Some areas of natural forests were leased to the households through protection contracts with the timber exploitation fund from the SFE (30,000 VND/ha).

According to our FGD results, in Nam Dong, land allocation policy is the main motivation for local people to actively plant and protect forests. However, due to limited funds, the planning, in particular forestry planning, in Thua Thien Hue province has not yet been completed consistently at the commune, district and provincial levels (Nguyen 2015; Nguyen and Nguyen 2016). The SFE, management boards, forestry companies and NPs have not yet allocated land according to the Land Law. All forest owners, either collective or households, still need to obtain a Land Use Right Certificate.

The land-use structure also created a dilemma. On the one hand, the area under the management of the SFE is very large and under weak management due to limited funds. On the other hand, Thuong Lo inhabitants do not have enough land for cultivation and food shortages are common, with an average of only 122 kg of rice/capita/year.

Resettlement program (DCDC program). From 1993, afforestation has been carried out to achieve the objective of the DCDC Project. So far, 92.2 ha (Thua Thien Hue Sub-Forest Protection Department 2015) have been planted. In sub-zone 1191, forest protection has been managed by the commune since 1991, with financial support from the DCDC Project (40,000 VND/ha) to 36 households for 748.8 ha. Incentives for local people to participate in the program include compensation for labor and future benefits from harvesting plantation forest. However, local people are unclear about the protocol and actual benefits they can access. Moreover, the forest plantation conflicts with the traditional swidden farming system of the Katu people, competing for land.

5.3 Decision 126/2012/TTg on piloting sharing benefit from special use forest (2011 to 2014)

According to Decision No.126/QĐ of the Prime Minister issued on 2 February, 2012, BMNP was one of the two Special Use Forests in Vietnam chosen as a pilot for the Benefit-Sharing Mechanism (BSM) from 2012 to 2014. The BSM was developed to sustainably manage natural resources through cooperation between the BMNP management committee and the people of seven villages in Thuong Nhat commune, with the support of the Vietnam Conservation Fund (VCF).

Under this BSM, people could get tangible benefits from the forest, including wild pigs, rabbits, snakes, snails, bamboo, bamboo shoots, orchids, rattan, honey, mushrooms and cash payments from the State for protecting the forest. The principles of the BSM pilot policy are, to some extent, similar to any other payment for environmental services scheme (PES schemes). It aims to: (i) ensure direct and voluntary negotiations between the Management boards (MBs) and local village communities (through the legal representatives of the so-called Management Council), with openness and transparency during the implementation process; (ii) bind responsibilities of stakeholders with their shared benefits; and (iii) harvest and use sharable benefits without causing negative impacts on the target conservation of PAs. The BSM covers: (i) 30 different forest products (wild plants and animals); (ii) all kinds of plants, crops and aquatic animals planted or grown under the forest canopy and bare land in the ecological rehabilitation sub-zone under the approved proposals; and (iii) PES, such as Thuong Nhat hydropower service, carbon credit trading, etc. (Vietnam Government. 2012).

However, to allow effective management, the BSM pilot that was approved by the Ministry of Agriculture and Rural Development in October 2012 included only seven non-timber forest products (NTFPs) as sharable products for the seven villages and the BMNP's MB (Nguyen 2015). The results of this program are mixed. Analysis of harvested NTFPs showed a nearly 30% increase in average household income, based on regulated access to harvesting by registered forest users (Huynh et al. 2016). The number of logging cases decreased significantly. There was no encroachment on forestland in the co-managed area, which had previously happened in some places along the park boundary and in the Thuong Nhat Commune. In 2013, households registered to participate in the FIMs were trained to collect NTFPs, which were zoned under the supervision of the forest management council. Of the seven types of NTFPs approved by the Ministry of Agriculture and Rural Development, five were exploited by local people for sale or for consumption: rattan, honey, Linh Chi mushrooms, bamboo shoots and snails. In particular, rattan and honey have large reserves and generate a high income. However, the scheme was faced with many challenges, such as conflicts arising from unclear boundaries of NTFPs collection zones, the effectiveness, efficiency and equity of how payment was collected by the village fund and how it was actually used, unclear protocol for registering, and inequity between those who registered and those did not (Nguyen and Nguyen 2016). Moreover, the difficulties experienced by those involved in the BSM pilot scheme included declining meeting attendance, infrequent meetings,

harvested amounts of some NTFPs exceeding those allowed by the benefit-sharing arrangement and forest protection teams failing to detect such irregularities (Huynh et al. 2016). Nguyen (2015) and Nguyen and Nguyen (2016) also highlight some other pros and cons of this program (Table 5).

Table 5. Pros and cons of Decision 126/2012/TTg.

Pros	Cons
<p>Local people in seven villages were allowed: to exploit and use natural resources and to cultivate animal and plant species on the list of species permitted for exploitation, use or rearing, as provided for in the agreement; to participate in, implement the agreement and propose opinions to the Management Board; to provide knowledge on forest protection, nature conservation and sustainable development of special-use forests.</p> <p>Local awareness of people's rights, benefits and responsibilities increased considerably. Some local communities still maintain traditional way of collaborative forest management.</p>	<p>Some social conflicts and inequities happened mainly due to unclear boundary demarcation at NTFP exploitation zones of each village.</p>

Source: Nguyen 2015, Nguyen and Nguyen 2016

5.4 Decree 24/2012

Decree 24/2012 on supportive policies for special use development and protection 2011–2020: supporting 25 out of 100 villages in the buffer zone with 40 million VND/village/year for local livelihoods, capacity building and infrastructure development in the village. In return, villagers sign an agreement to protect the forests. If not, the payment will be moved to another village. Decree 24, to some extent, is a direct PES payment with a fixed rate. However, as FGD findings indicate, the program was not successful because of the small payment; a fixed rate does not encourage forest enhancement and the program created conflicts amongst villages on eligibility criteria (Table 6).

Table 6. Pros and cons of Decree 24/2012.

Pros	Cons
<ul style="list-style-type: none"> • Requires more than 70% local people to participate in meeting to design, plan and budget. • The villagers have to commit to protecting the forest. • NP together with local authorities select the villages based on the following criteria: proximity to forest, high poverty rate, very reliant on forest products. • Villagers' plans submitted for finance were based on their need for development, such as chicken raising, livestock production, and infrastructure upgrades. The NP plays a role in budget allocation to the village. 	<ul style="list-style-type: none"> • Low capacity at village level in planning and implementation. • Late payment from provincial budget. • Lack of budget from provincial level and government. • Weak in cooperation and linkages between ministry and departments.

Source: FGD results 2017

6 Payment for Forest Environmental Services (PFES)

6.1 PFES in Thua Thien Hue

According to Tran (2017), PFES started in 2011 in Thua Thien Hue. There are six environmental service buyers in Hue (one water supply company and five hydropower plants: Huong Dien, Binh Dien, A Luoi, A Roang and Thuong Lo). By the end of 2017, PFES revenue was around VND 100 billion. PFES payments have been used to pay for patrols to protect 130,000 ha of a total 283,000 ha of provincial forest (46% of total forest area in the province). Up to now, more than 4800 households in the province have benefited from PFES. PFES payments under community forest and household contracts are mainly used to pay for villagers to patrol the forest. Average payment ranges from VND 100,000–150,000/day.

6.2 PFES program in Bach Ma

A PFES program has been running in Bach Ma National Park since 2015. In 2016, the PFES revenue paid by Quang Nam for BMNP was VND 1 billion and from Thua Thien Hue was VND 84 million. The level of payment for PFES has increased over time (158,000/ha in 2015; approx. 170,000/ha in 2016 and approx. 210,000/ha in 2017). Of the households interviewed, 36.4% stated that they had participated in the PFES scheme since 2015, either directly at household level or community forest level. Since 2017, 18.2% households have participated under subcontract to BMNP.

Three districts surrounding BMNP participated in PFES in different forms and received different PFES payments according to differences in their forest area and forest quality. According to the survey results, Huong Loc commune has two forms of PFES participation: individual household contract and community forest contract. For Thuong Lo commune, there are two types: community forest and households subcontracted by BMNP. In these two communes, there are households that participate in one or both types (Table 7).

Table 7. Forest contracts, PFES area and ethnic groups in studied sites.

	Thuong Nhat	Thuong Lo	Huong Loc
Forest contract	Community forests for 7 groups of households (65 households in total)	Community forests contracted to different groups of households	Community forest Household groups signed with NP Households
PFES area	1100 ha	3600 ha	7000ha
Ethnic groups	Co Tu, Kinh	Co Tu, Kinh	Kinh, Co Tu

According to FGD findings, PFES has brought additional income and created additional financial incentives for local people to protect forests. Forest quality and area are perceived by the households interviewed and FGD participants to be better since PFES was introduced. BMNP officers also asserted that PFES creates flexible financing for the park to hire more labor for forest protection activities, with additional funding for training and supporting forest owners in being more active in managing and protecting the forest. PFES has also received significant political support from local government. FGD results in two districts also revealed that PFES helps to provide additional incomes for forest patrol teams and PFES money for community forests is used to create loans for villagers raising livestock and to support community activities. However, the institutional setting of PFES also reveals several drawbacks that were perceived as major challenges for effective implementation of PFES in the studied area.

Not tailored to local needs. The frequency of payment is different for different groups: once per year for community and individual contracts and twice per year for groups of households under contract to BMNP. However, according to the households interviewed and an FGD (41 participants) the timing of payment is not appropriate (Table 8).

Table 8. Frequency of PFES payment.

Form of participation	When and how often?	Issues raised by communities
Directly at household level	Annually, at the end of the year	Often delayed and does not match their planning
Participate in community forest under PFES program	Paid immediately after the patrol is completed	Not much difference
Subcontract by Bach Ma NP	Biannually (April and November/December but only received in June/July)	Does not match their planning or meet the time they need money for agriculture inputs

Source: FGDs findings 2017

Selection and eligibility criteria are imposed from above and discriminate against marginalized and vulnerable groups. According to households interviewed and FGD findings, eligibility and selection criteria for PFES recipients in the three studies has both opportunities and challenges for environmental and social outcomes (Tables 9 and 10).

Table 9. PFES payment criteria.

PFES participation forms	Eligibility criteria	Who and how to determine eligibility criteria	Opportunities	Challenges
Community forests	<ul style="list-style-type: none"> Good health and have ability to monitor forests (all three communes) One household can only participate in one form of PFES contract (Huong Loc commune) 	The eligibility criteria were determined through the village meeting and voting from villagers. The participants have to submit a letter to show they volunteer to participate in forest group protection	Households can have additional incomes	Gender issues and social equity, e.g. old men and women cannot participate and benefit from PFES
Households under contract to NP	<ul style="list-style-type: none"> Good health and have ability to monitor forests (all three communes) One household can only participate in one form of PFES contract (Huong Loc commune) 	NP staff decide who can participate in forest patrols and has contracted household leaders who have forest areas close to or bordering the NP	Households can get payments from the NP	Some forest areas border other villages, so it is impossible to control illegal logging by people from other villages
Individual households directly receive PFES payment from the PFES Fund	<ul style="list-style-type: none"> Having the forestland use right certificate issued by the government One household can only participate in one form of PFES contract (Huong Loc commune) 	NP staff decides who can get PFES and payment levels from forest protection	Increase household income, PFES payment can be used as microfinance to support villagers	Conflict or complaints from other local people who are not paid from PFES

Table 10. M&E criteria for different PFES contract in studied sites.

PFES contract	M&E criteria
Individual household	No rule on when and how many times patrolling is needed, depends on households; some households patrolled once per month, others patrolled 3–4 times/month, some only patrolled once every 3 months. The closer the forests to household-owned acacia plantations, the more often households patrolled NP forests.
Community forests	Households interviewed could not remember how many times they were required to go for patrolling. They often patrolled in groups group, one person can join 1–2 times/month.
Subcontracted by BMNP	Every patrol was 4 days and 3 nights, in a group; each household can patrol up to three times/month

Source: FGDs results 2017

Inequity in applying eligibility criteria. FGD results in Huong Loc confirmed that a key criteria for PFES distribution is that any single household can only have and benefit from one type of PFES contract. However, FGD findings and households interviewed in Huong Loc found that there are households that received PFES payment for more than one PFES participation form creating a sense of inequity among villagers.

Weak conditionality and monitoring and evaluation. PFES is expected to be different from other conservation programs because the service providers are only paid if they actually deliver the services. However, Table 10 shows that the M&E criteria are less clear for individual contract and community forests than for subcontracts with the NP. Most households interviewed did not know about the formal compliance protocol and the consequences if they did not comply with the laws. Different communities and different villages have different punishment protocols. The most common non-compliance approach adopted by the village is social punishment, which refers to exclusion from community groups and must be contested in community meetings depending on the level of violations. Only in village C (Huong Loc commune) are forests given to other households and the red books (certificates of land-use rights) taken back by government. Many households interviewed also highlighted the unclear protocol and requirements for enrollment and withdrawal from PFES.

FGDs participants also highlighted that villagers' capacity for patrolling and handling violations is still weak. Law enforcement by the NP is not always strictly followed. According to interviews conducted with households and FGD results, forest rangers only caught illegal logging, but not illegal poaching and hunting if this was for household consumption. Even in the case of illegal logging, the NP had to release illegal loggers as they were associated with upper government authorities. M&E for both individual and community contracts also have major limitations.

M&E for individual PFES contracts.

An interviewee stated that:

Regarding control of my protection activities, every half a year a CPC [Commune People's Committee] staff member and a ranger check the forest quality. If there is deforestation, they will find a reason for it. But this has not happened yet so I do not know if I will still get the money.

Another interviewee also stated that:

The Sub-FPD [Forest Protection Department] only comes to check the forest if I report something there. So yes, in theory I would still get the payments if I did not patrol. No one is checking this; there is no capacity for that. It depends on the awareness of each individual forest owner.

Another interviewee also confirmed:

CPC and Sub-FPD come to check forest quality once a year and sometimes for sudden controls but this never had an effect on payments.

M&E for community forests.

An interviewee stated that:

If someone logs the forests, there is usually no fine or official punishment, just a complaint in front of all other households. People are eliminated from the community forest group if they don't take part in forest protection.

A member participating in the FGD also stated:

We are just self-controlled. There is no one who checks if we patrol.

As shown in Figure 4, 40% of the respondents said that the payment distribution for PES should be based on labor input for forest protection. The number of days each villager spends for forest protection patrolling activities should be used as a basis for PES payment, regardless of whether forest quality and quantity has improved or not. In contrast, 36% of interviewee agreed that payment distribution for PES should be based on the output produced (e.g. in terms of forest fires prevented, tons of carbon sequestered, forest type). Because villagers consider the forest to be their property, they want to keep the forest for their children, for next generation.

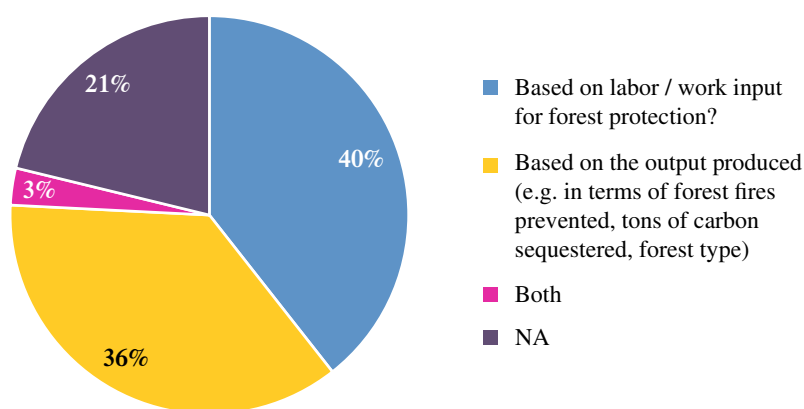


Figure 4. Basis for payment distribution.

Small level of PFES payment. According to household interviews and FGD results, the level of PFES payment is too low to even cover the labor costs of villagers. Figure 5 shows the complex payment distribution arrangement in the studied sites. It shows that in addition to formal PFES payment distribution (payment to NP and from NP to local people), self-decided payment mechanisms are also developed at both community and village level. PFES recipients interviewed also claimed that they received payments both in kind and in cash (93.9% villager received PFES by cash, only 3% said that they receive payment in kind). Among them, 87.9% preferred to receive cash payments because it was easy to use according to the needs of each person.

The current benefit-sharing mechanism carries several risks that were widely discussed by FGD participants and household interviewees. First, the current benefits only go to an elite group and

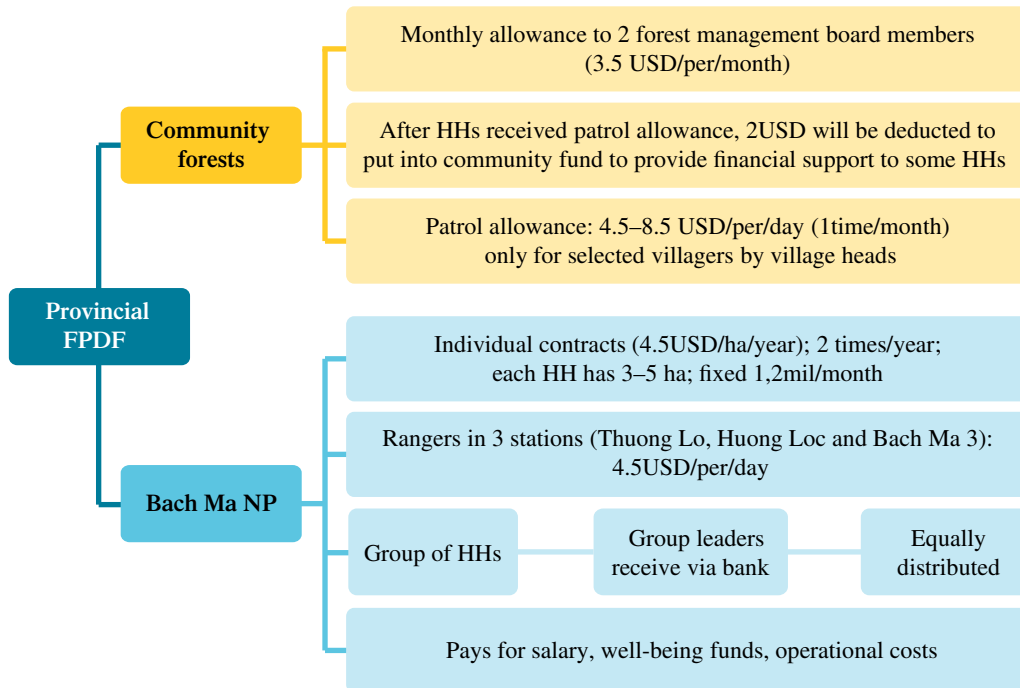


Figure 5. PFES financial flows in Bach Ma National Park area.

villagers nominated by the head of village, and the poor are often overlooked. Second, current PFES contracts, as well as other forest protection agreements, are initiated by government agencies with limited involvement of local people (Figure 6). Third, the complex payment distribution to different groups with different arrangements and payment levels coupled with unclear criteria on how to enroll and withdraw from PFES have confused local villagers. Fourth, although PFES was put into a village fund, FGD participants and households interviewed claimed that payment was kept in the fund and households were not informed how the money was used.

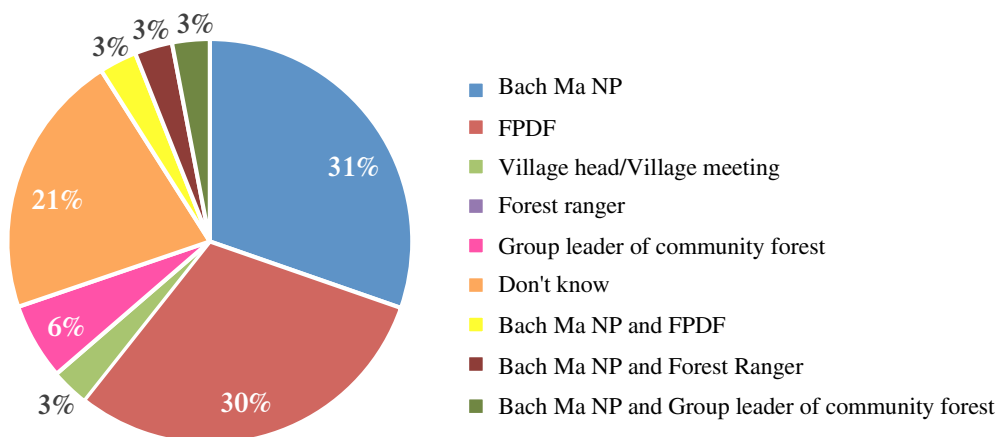


Figure 6. Who decides the frequency of PFES payment?

7 Discussion

As our findings have shown, conservation programs and benefit-sharing mechanisms in the sites studied face many implementation challenges underpinned by social-psychological mechanisms. The policies are designed based on limited understanding of the social-psychological mechanisms underlying participatory conservation impeding the search for appropriate solutions. Different institutional settings create social acceptance and conservation outcomes (Decaro et al. 2008).

The implementation of the above policies and programs in Bach Ma National Park clearly show government efforts in combining multiple initiatives and incentives (both in kind and in cash) in supporting local livelihoods and conservation outcomes. Several important lessons that need to be carefully considered for future include:

- Cash payment is often too low to meet local needs. To date, all direct cash payments under different programs are too low to cover opportunity costs and labor costs required by local people to fully commit to their effective implementation.
- In-kind payments, such as in the case of Decision 126/2012/TTg and Decree 01/2000, and in-kind benefits, such as permission to access forest resources or land-use right certificates, were indeed preferred by local people as they have the potential to increase income through official access to resources. FGDs conducted in both districts confirmed this. They stated that allocation of forestland to the two districts has led to reduction of deforestation.
- Combinations of both in-kind and in-cash payments offer more incentives for local people to comply with laws. As discussed earlier, land allocation policies and equitable benefit sharing between SFES and local people are two in-kind incentives that drive local people's commitment to forest protection and development.
- Who benefits? According to Decision 126/2012/TTg, the benefit derived from PFES should be shared between the NP and local communities. The relationship is on a more equal basis and the benefits are shared based on equality rather than contractual relationships where the NP hires local people to protect forests and then receives a PFES payment. There is no comparison to date on the different impacts that these two schemes might have, but this deserves attention in the future
- Performance-based contracts? The above policies and incentives are designed with different performance-based criteria, but there is no monitoring and evaluation in place to monitor whether these criteria are fulfilled.

Using Loft et al.'s (2017) framework on equity, we consider below the contextual, procedural and distributive equity of different BSMs in our studied sites.

7.1 Contextual equity

As discussed earlier, drivers of deforestation and degradation in the studied sites are complex and rooted in a sociopolitical context. The tenure context, as well as the underlying conflicts over resources and benefit access between NP, SFES and local people requires careful attention from decision makers during the implementation of PFES. The fact that some villages have PFES government support, such as Decree 24 and Decision 126, and the other villages do not, leads to different views among villagers on the fairness and equity of those schemes. Harmonizing the existing schemes and disseminating better information to local people in a transparent way is essential to maintaining the current engagement of local people in these schemes. As there were PES-like schemes before PFES such as Program 661, Decision 24 and Decision 126, the additionality of PFES that current environmental services users are paying is questionable. Moreover, the community forest is 176 ha but PFES

payments are made just for 99 ha because the rest of the forest is not natural and very poor in quality. What incentives can help to enhance the quality of these 77 ha poor-quality forest?

7.2 Procedural equity

Three factors affect the acceptance of environmental protection: the quality of park management committee, involvement of the population in park management and external payments for the conservation of biodiversity in the region, e.g. PES. Webb (2004) found that local perceptions on an NP depend on economic opportunities and location, equitable part policies and active involvement of local people in decision making. However, current literature highlights the often-negative perceptions of park management and governance (Vedeld et al. 2012; Bennett and Dearden 2014; cited in Puntscher et al. 2017). The fact that local people are not involved in other policies such as Program 661 and selling timber from SFES, as well as PFES, has led to latent conflicts between these villagers and the NP and SFES. The process of selection of villages as recipients of certain government programs and the selection of who will be nominated as village patrollers to receive PFES payment are not clear, participatory and transparent, leading to conflicts and impeding the effectiveness of these programs. Furthermore, PFES is different from other PES-like schemes in that it is a conditional payment based on results. However, the fact that non-compliance is not addressed adequately (e.g. park rangers just reminded, but never fined or punished those who harvested NTFPs without permission papers) weakens the effectiveness of the program and creates inequity between those who have complied and those who have not.

7.3 Distributive equity

As discussed earlier, current PFES payments likely only benefit an elite group. The fact that payment was kept in a fund without releasing to households and households were not informed about the utilization of the fund further enhances the latent conflicts that are already in place in communities. Positive conservation and socioeconomic outcomes were more likely to occur when PAs adopted comanagement regimes, empowered local people, reduced economic inequalities, and maintained cultural and livelihood benefits. Whereas the strictest regimes of PA management attempted to exclude anthropogenic influences to achieve biological conservation objectives, PAs that explicitly integrated local people as stakeholders tended to be more effective at achieving joint biological conservation and socioeconomic development outcomes. Strict protection may be needed in some circumstances, yet our results demonstrate that conservation and development objectives can be synergistic and highlight management strategies that increase the probability of maximizing both conservation performance and development outcomes (Oldekop et al. 2016).

7.4 Beyond economic value and outcomes

The potential impacts of PES and PAs on environmental outcomes and local livelihoods in developing countries are contentious and have been widely debated. The available evidence is sparse, with few rigorous evaluations of the environmental and social impacts of PAs and particularly of PES (Clements and Milner-Gulland 2015). However, while impacts of PES have often been assessed through an economic lens, less analysis goes beyond economic value. In Vietnam, Pham et al. (2009; 2013; 2014) observed that three major motivations influence people's participation in environmental policies and PFES: law and policies, economic incentives, and social and cultural of motivations, including social approval and disapproval. However, the current and dominant literature on PFES often lacks understanding and analysis of social norms and overlooks what will happen to behavior once payments end. If PFES only takes a narrow economic perspective, this can potentially overlook the non-economic incentives. Financial incentives often do not act on their own in changing human

behaviors, but also act in combination with intrinsic motivations. The current paradigm of motivating communities in developing countries to adopt conservation behaviors primarily through monetary incentives and rewards should consider integrating autonomous motivational techniques that promote the intrinsic values of conservation (Nilsson et al. 2016). Any conservation programs would be more effective and easy to enforce if local social norms and attitudes favor conservation. Berghöfer et al. (2017) argued that we do not lose biodiversity and ecosystems in Vietnam and other countries primarily for lack of conservation funding but because of poor governance, wrong policies, perverse incentives and other factors. This begs the question: How should limited conservation resources be used? To directly tackle biodiversity threats, to address the underlying drivers, or rather to strengthen the financial management and fundraising capacity of implementing organizations?

8 Conclusions

Local livelihoods in the studied sites highly depend on forests, resulting in increasing pressures on forests and NPs. Deforestation, forest degradation and biodiversity loss is rooted in local needs, infrastructure development, local economy development (handicraft companies' demand for rattan), trading in wildlife meat and weak law enforcement. The existence of multiple replace it with Financial Incentive Mechanisms (FIMs) leads to difficulties in measuring the impact of any individual FIMs, while the lessons learnt are not incorporated into other FIMs. FIMs were developed without proper consultations with local people and are often based on limited understanding of people's preferences and options leading to conflicts and risks at different governance levels. The absence of a clear M&E framework creates weak law enforcement and weak compliance of local people to these programs. As a result, the current FIMs have not effectively addressed the drivers of deforestation and degradation. Our study calls for a better understanding of local perceptions on needs and interpretation of equity in benefit sharing to be incorporated into policy design. Better law enforcement, a clear M&E framework, as well as an improved participatory decision-making process are also required to enhance conservation outcomes, local livelihoods and local commitment in forest protection and development.

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Vietnam is ranked as the 16th most biodiversity rich country in the world. Many biodiversity conservation programs were designed in the early 1990s to address increasing threats, such as illegal logging and wildlife trade, to existing protected areas and national parks (NPs) in Vietnam. Using Bach Ma National Park as a case study, this paper analyzes both economic and non-economic incentives applied in the area to address drivers of deforestation and degradation. A policy review was conducted. Focus group discussions were carried out with Bach Ma National Park representatives and local people in two districts (Phu Loc and Nam Dong) in Thua Thien Hue. Interviews were also conducted with 33 households in Thuong Lo and Huong Loc commune, Nam Dong district. The results show the NP experiences a high pressure of deforestation and degradation, as well as biodiversity loss because local livelihoods are highly dependent on forests for food needs, local economic development (handicraft companies demand for rattan) and trading in wildlife meat while local authorities need infrastructure development. Weak law enforcement has not been effectively addressed by the local authorities. Since 1991, multiple financial incentive mechanisms (FIMs) aiming to motivate people to better protect and develop forests have been implemented in the area. However, this has led to difficulties in measuring the impact of individual FIMs and incorporating lessons learnt into others. The absence of a clear monitoring and evaluation framework creates weak law enforcement and weak compliance of local people with these programs. Moreover, most BSMs were developed without proper consultations with local people leading to conflicts among different stakeholder groups. As a result, the current BSMs have not effectively addressed the drivers of deforestation and degradation. Our study calls for a better understanding of local requirements and equity in benefit sharing to be incorporated into policy design. Better law enforcement, a clear monitoring and evaluation framework, as well as an improved participatory decision-making process, are also required to enhance conservation outcomes, local livelihoods and local commitment in forest protection and development.



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