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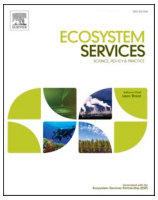

Full Length Article

The challenges of collective PES: Insights from three community-based models in Vietnam

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ABSTRACT

Vietnam has adopted a national Payment for Forest Environmental Services (PES) policy, which while primarily paying individual households for forest protection, has been flexible enough to allow for collective PES models to also arise. Such collective models have the potential to reduce transaction costs, avoid motivation crowding, and protect common-pool resources like community forests. This paper analyzes three different types of collective PES models that have been tried in Vietnam: community land titles and PES payments to whole villages; group titles and PES payments to collections of households; and collective patrolling with payment contracts but without land tenure rights. We draw on fieldwork across three provinces to examine how these different forms of collective PES have arisen, and how they have articulated with existing forest governance institutions and local social characteristics. We also assess what the advantages and disadvantages for each model are. Overall, we argue that none of Vietnam's collective PES models have achieved unqualified success in generating positive collective action outcomes, and each has challenges that have undermined group efforts, exacerbated underlying problems, or even created new conflicts. Based on our assessment, achieving a mix of individual (primarily financial) benefits together with collective rights and benefits is important for both social cohesion and forest protection. As a result, improving existing local institutional capacities and reinforcing group cohesion to achieve collective action success remain needed within Vietnam's collective PES models.

1. Introduction

Payments for Ecosystem Services (PES) initiatives have boomed as a supposedly more efficient and effective means to improve environmental conservation and development (Pattanayak et al., 2010), and a range of programs have been designed for carbon sequestration, biodiversity conservation, and watershed functions worldwide (Pagiola et al., 2005; Gómez-Baggethun & Ruiz-Pérez, 2011; Muradian & Rival, 2012). In theory, PES was primarily designed around voluntary participation of individual landholders (Wunder, 2005; Southgate & Wunder, 2009), yet as PES has been adopted globally, real-world arrangements have expanded to also include collective agreements. In these cases, resource users, such as groups of neighbors, kin, or an entire community, collectively participate in PES and agree to limit or change their shared use of resources in exchange for a reward (cf. Murtinho & Hayes, 2017). These collective and/or community-based PES arrangements have become increasingly common worldwide and present several possible advantages.

First, land in the rural global South is often managed under long-standing common property regimes; thus, collective PES models provide a potentially better fit with the common-pool nature of resources being protected (Kerr et al., 2014; Barnaud et al., 2018; Hayes et al., 2019). Second, collectively altering behavior and complying with resource-use restrictions in exchange for a (collective) payment has particular appeal in reducing transaction costs incurred by working with large numbers of individuals in low-density and scattered populations (Kerr et al., 2014; Murtinho & Hayes, 2017; Hayes et al., 2019). Third, collective PES models also show promise in harnessing locally appropriate norms and social sanctions to avoid problems of motivation crowding (Kerr et al., 2014; Rode et al., 2015); for example, strong community governance characteristics make it more likely that individuals will conform to expected PES requirements (Hayes et al., 2017;

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Hayes et al., 2019), although such collective mechanisms might also increase free-riding (Kaczan et al., 2017).

Yet despite many advantages, questions still remain about the outcomes of these models in practice, given that PES financial incentives that were designed for private property may not necessarily promote collective action (cf. Poteete & Ostrom, 2004). Extensive work on common property over the years has pointed out challenges like heterogeneity of communities as barriers to collective action (Agrawal & Gibson, 1999). Yet the literature on PES devotes little attention to comparing collective PES's relative effectiveness in heterogeneous settings as compared to individual benefits (Kaczan et al., 2017), although there are indications of potentially more cost-effectiveness if barriers can be overcome (Narloch et al., 2017; Moros et al., 2019). How PES should or can incentivize collective action and the models and modalities for doing so (e.g., in cash, in-kind, through land tenure or other rewards, etc.) remains an open question (Narloch et al., 2017; Kerr et al., 2014).

The activities to be incentivized by PES can include development of collective institutions and procedures for operational rules (e.g., who has access to resources, what actions may be taken or not taken to safeguard ecosystem services, other limits on user behavior, and means for obtaining compliance (cf. Ostrom, 1990)), but few collective PES programs have been examined for how they help fulfill these tenets (Barton et al., 2017; Sattler et al., 2015). In cases where communities have been actively involved in program design, PES outcomes have often been more positive (Rawlins & Westby, 2013), and the need for PES programs to pay attention to equity and legitimacy among participants apply equally, if not more so, to collective PES (Leimona et al., 2015). For example, Hayes et al. (2017) found in Ecuador that rule making and enforcement that was considered legitimate by the community was indeed important for accepted and successful implementation of PES, perhaps even more important than the financial incentives. One additional way in which PES can 'piggyback' onto existing effective common pool management systems may be through linkages to collective property rights. For example, when PES contracts are signed with collective landowners, they have already worked out rules of access and enforcement that then might be successfully 'transferred' to the PES activities, such as in Ecuador and Mexico's national PES programs (Hayes et al., 2019; Pfaff et al., 2019; Murtinho & Hayes, 2017).

Vietnam provides a unique setting in which to explore a number of models of where collective action is taken as part of benefit sharing in PES. A national law in place since 2010 generates on average US$ 120–130 million per year for forest protection in 5 million hectares of uplands, accounting for 66 % of natural forests across the country (VNFF, 2020). However, while the national law provides general guidance for the program, each of the 44 participating provinces has the right to decide on their own benefit distribution mechanisms, leading to multiple local collective action models, given that there is some sort of collective forest management arrangement in 70 % of PES-participating provinces (PanNature, 2019, 2021).[1] These range from communities with collective forest land title receiving community-wide PES payments; organized kin and clan groups managing forests to receive payments; communities without land titles providing collective patrols for protection of state forest lands and paid collectively; and other combinations. This diversity provides an opportunity to compare different collective PES models for how variation in social and ecosystem services outcomes might arise and why, and how models may or may not conform to principles to generate collective action outcomes (Ostrom, 2000; Poteete & Ostrom, 2004). To date, no studies have specifically looked at the different collective PES models in Vietnam despite considerable attention to PES in general (Pham et al., 2014; To & Dressler, 2019).

Through research on several local case studies on collective action, defined as group effort and action in pursuit of members' perceived shared goals or interests (cf. Barnaud et al., 2018), we find that each of the models has emerged from a hybridization of PES practices with customary and communal forest use practices in Vietnam. These models have been expected to meet the state's objectives of improved forest management institutions while providing social cohesion and economic benefits for local communities. Yet our research finds that the current collective PES arrangements are primarily aimed at reducing transaction costs, rather than empowering communities, and community benefits remain elusive for many. Low PES payments, coupled with limited sharing of information and decision-making authority within communities, have troubled the collective PES schemes. Communities have been unable to establish collectively acceptable rules, defined benefit sharing, or conflict resolution arrangements, creating challenges for positive collective action outcomes, lessons that have relevance for other areas of the world attempting to organize collective PES.

To make these arguments, we first contextualize the emergence of collective PES arrangements in Vietnam and describe the methods we used to understand the three different collective PES models. Our research with communities reveals a number of problematic issues, particularly in terms of tensions between individual versus collective benefits and effectiveness of collective action outcomes. In the discussion, we focus on several factors, including financial benefits, tenure security, and group features that appear to be most important for collective action outcomes, and provide some recommendations to improve collective PES models in Vietnam and globally.

2. Study site

2.1. History of communal forest management in Vietnam

Both collective action and PES policies have been influenced by Vietnam's history of forest management. Traditionally, different ethnic communities and local villages classified forests based on their cultural and social values, and governed different forms of common property through long-standing community institutions, which often combined individual/family rights to forests with group oversight and rule to keep land within the community (Andersen, 2011; To, 2013). Yet after the Democratic Republic of Vietnam (DRV) was founded in 1954 in the North and national unification with the South in 1975, the State formulated grand plans to use collectivization as a strategic tool (Kerkvliet & Selden, 1998). These fundamental changes transferred authority over land and forests from local villagers to a collective production system under state control, leading to erosion of local and community control (Sikor & Apel, 1998; Bui et al., 2004), tensions over forest resources with the state, and a drastic decline in Vietnam's forest area (To, 2015; McElwee, 2016).

After *Doi Moi* (Renovation) policies in 1986, emphasis shifted to decollectivization and devolution in the forestry sector (McElwee, 2016). Large areas of forestland previously controlled by the State were transferred to non-state actors, mostly individual households, who were provided with Land-use Right Certificates (LUC) (also known as Red Books (*sổ đỏ*)). Each forest user was given clearly defined and exclusive rights to exchange, transfer, inherit, mortgage, and lease (Nguyen et al., 2008; To, 2013). During this process, communal tenure was mostly ignored and consequently this privatization process replaced some remaining customary systems (Ironside, 2017).

Yet despite these changes, in many places customary laws and communal tenure persisted, especially in highland areas where the vast majority of Vietnam's ethnic minorities live and where the state focus on individual household forest allocation was inconsistent with these systems; some communities even refused to accept individual LUC rights

[1] [1] The data results from a nationwide survey led by the first author (NTHV) in collaboration with Center of People and Nature Reconciliation (PanNature, https://www.nature.org.vn) to collect data related to Vietnam's community-based forest management in 28 provinces during 2018–2019, and updated by 10 additional provinces by October 2021.

(Sikor, 2001; Sikor, 2004; Hall et al., 2011; To, 2013). A number of donor-supported models for community-based forest management (CFM) emerged (Sikor & Lund, 2009), and a revised 2003 Land Law formally recognized communities as legal land users for the first time. By the end of 2019, around 8 % of total forestland had been officially allocated to communities (MARD, 2020).

Currently, CFM models are quite diverse in their origins and management forms (see Table 1). In terms of *structure*, some involve an entire community, while others form smaller user groups (e.g., 10–20 households), some of which may involve relatives or clans and in other areas unrelated families with different ethnic origins. In terms of *management approach*, CFM models have included legalizing traditional use rights, while in the early 2000 s in the Central Highlands, communities were allocated forests for protection and sustainable commercial logging. However, due to a subsequent State logging ban in natural forests since 2011, this approach was impossible to implement, and many communities received and protected forests but cannot financially benefit from them. In terms of *land titling and tenure*, some CFM models have allocated forestland to communities with collective land titles, including the five rights promulgated by the Land Law, while other CFM models focus on participation in forest management through contracts with state forest owners (To & Tran, 2014). These different CFM models have created an institutional mix that converges old and new, formal and informal systems, giving rise to collective "tenurial bricolage" (cf. Cleaver, 2000). In this institutional mix, collective action dilemmas (cf. Ostrom 1990) can arise when members of groups are unclear about what they have "rights to and what they merely have access to" (Sikor & Lund, 2009: 2).

Accordingly, there have been mixed results from these CFM arrangements in practice (Sikor & Nguyen, 2011; Pinyopusarerk et al., 2014; Nguyen et al., 2015; Moeliono et al., 2017). Some models built on customary systems have achieved consensus participation among villagers in design and implementation with good results (Phan, 2020). In other areas, local villagers have treated allocated community forest areas as open access with negative consequences like deforestation (Tran & Sikor, 2006; Sikor & Nguyen, 2007; Tran, 2020a; Tran, 2020b). Many local communities could not fully realize the rights given to them in law, and these legal tenure rights were insufficient compared with previous customary systems (McElwee 2011). In other cases, forests that were given to communities were of poor quality, with little investment and unclear guidance on how forests should be rehabilitated or benefits from forest management realized. Thus, CFM models have looked to PES as a possibility to bring new financial incentives to encourage participation of local communities in forest protection and to improve local livelihoods.

2.2. The rise of PES collective arrangements

Decree No.99 in April 2010 by the Prime Minister established a PES program for the first time in Vietnam which allows for payments for five different types of ecosystem services. The policy also identified "service buyers" – hydropower plants, domestic water suppliers, tourism companies and others. Fixed payment rates were established in the original law and have since been revised upwards in 2018. PES payments go to providers who own, maintain and/or protect forests, including state organizations; communities and/or group of households; or individual households. The national PES policy also allows each province to be proactive in their own PES design and implementation to reduce transaction costs.

As a result, collective arrangements have emerged in 28 of the 44 provinces implementing PES (PanNature, 2019). These build on models inherited from the previous CFM approaches, including entire communities (Model 1) and kin, clan, or neighbor groups with collective forest land title for managing forests (Model 2) (not all CFM forests receive PES, however; see Table 2). In addition, a third collective PES model has emerged, where communities or groups of households receive PES money collectively through forest protection contracts but without land title. In other words, the payees are third-party beneficiaries, and the legal landowner (a state organization) "passes through" the PES payment (Model 3). This model has arisen given that large areas of natural forests (76 %) in Vietnam are still under the management of state forest owners (MARD, 2020). Overall, PES revenue is supposed to become a new financial source to mobilize and increase motivation, support community development (VNFF, 2017; Duong & De Groot, 2018), and build long-term sustainable CFM (Nguyen, 2020).

3. Methods

The authors conducted fieldwork in different provinces of Vietnam (Thua Thien Hue (TTH), Kon Tum and Lam Dong) (see Fig. 1) in different time periods (2011–2014, 2016 and 2019–2020), aimed at understanding local conditions under which different PES models were designed and implemented over the past 10 years. In Kon Tum, the province has implemented forestland allocation and piloted a model of sustainable community forestry through distribution of official land-use titles since the 2000 s, and since the late 2010 s, has pursued potential financial incentives for this model from PES and REDD +. The case in Kon Tum was selected to represent model 1 (entire village with land title). Thua Thien Hue (TTH) is known as one of the first provinces piloting community-based forest management since 1995 but has experienced strong pressure from smallholder acacia plantation expansion, such that policymakers have increasingly turned to a new PES model using groups of households comprising kin or neighbors who agree to provide collective protection of forests. Thus, the TTH case represents model 2 (group of HHs with land title). Lam Dong was one of the two first provinces that piloted PES in Vietnam; however, due to very little devolution of forest land to local households and communities, third-party forest protection contracts, but no land tenure certificates, are the most dominant approach. The case in Lam Dong, therefore, represents model 3 of third party contracts (see Table 2).

In each site, we employed mixed methods, including in-depth structured survey interviews with 264 total households, focus group discussions (FGD), and participant observation with communities involved in PES (see Table 3), as well as interviews with stakeholders directly involved in PES governance (e.g., district forest department staff, village heads, etc.). The households selected for survey were

Table 1
Different types of CFMs in Vietnam.

Classification based on	Different types of CFMs in Vietnam	
Structure	An entire village	Household groups (10–20 HHs)
Management approach	Traditional customary system	Newly designed CFM for sustainable commercial timber exploitation.
Land titling	State formal Land-use Certificate (LUC), or Redbooks	No land title but under forest protection contracts

Source: Synthesized by authors and PanNature, 2019.

Table 2
Three models for collective PES in Vietnam.

	Allocated forest area (ha)	Of this, forest area under PES (ha)	Percent of this type of forest area that receives PES
Entire village with land title (also known as Model 1 in the paper)	1,281,617	323,592	25.3 %
Group of HHs with land title (Model 2)	19,096	13,858	72.6 %
Groups of HH with contracts (Model 3)	39,809	39,809	100 %

Source: synthesized by authors and PanNature, 2019.

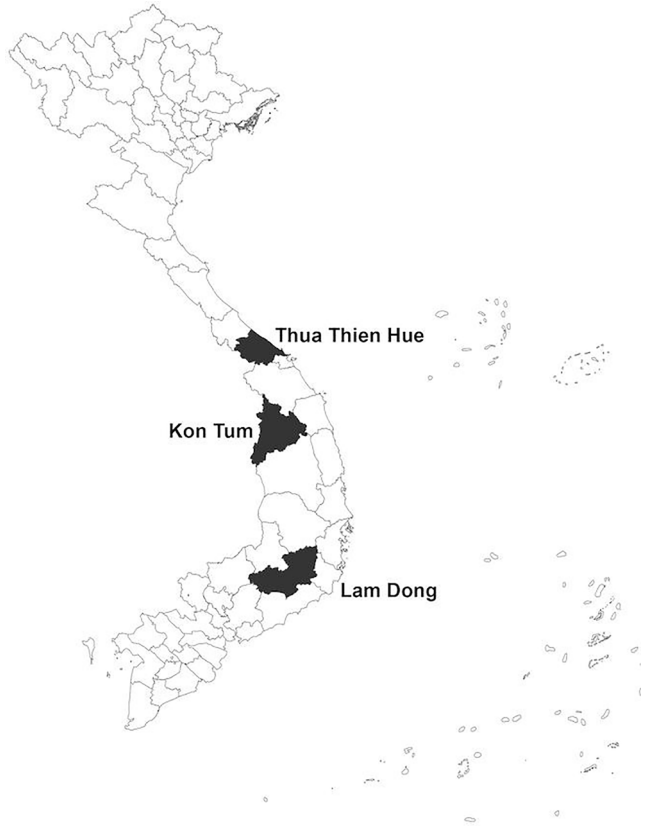

Fig. 1. Location of field sites.

chosen by random sampling from the household census lists in each surveyed village, in which every *k*th household was chosen for interview (*k* was based on target sample size which varied in each province). In each village, the surveys reached around 15–25 % of the total population to ensure representativeness. The household survey was developed based on preliminary assessments and field-tested ahead of time for clarity by all authors. The surveys were administered in 2011–2012 in Lam Dong (carried out by PM, TPN, HTL and HDV) and in 2012–2013 in Kon Tum (carried out by VTHN), while the survey in Thua Thien Hue (TTH) was carried out more recently in 2019 by VTHN as part of her Ph. D. research. Shorter follow-up visits in each province have occurred since the surveys as well for information updates across the three locations.

Focus group discussion were held with village leaders and selected small groups (for example, the elderly, women, and different ethnic groups). We discussed with village heads how to select participants to ensure the representatives of all key groups participating in forest management in each locale. These smaller meetings were held near the end of the household survey to capture: (i) general histories of resource use to determine how villagers set up institutions for managing forests, how these institutions functioned at different times, and how local institutions interacted with official forest policies like PES; and (ii) cross-check some general key findings from the household survey. Participants were notified about 1–2 days in advance and voluntarily participated, joining at a convenient time (such as lunchtime or in early evening) at the village meeting hall to ensure villagers' participation.

All survey interviews and discussions with respondents were conducted face-to-face by the researchers, mostly in their houses for the survey, and community meeting hall for FGDs. We clearly stated our institutional affiliations as separate from government offices who maintained the PES schemes, and our university affiliations in particular were seen by respondents as clearly focused on research, helping to ensure comfort of respondees. We followed institutional requirements for ethical conduct and obtained approval from our universities, the Institute of Geography and Sustainability (University of Lausanne), Rutgers University, and Vietnam National University, Hanoi. All respondents were provided with an informed consent summary document, to which they gave oral or written consent for voluntary participation. No subjects refused to take part in the survey or the FGDs, although some selected households for the survey were not available and were substituted with another randomly selected household. In addition, confidentiality for interviewees was included in the informed consent approach. Field notes were made by hand and not tape recorded to ensure safety and limit the possibility of concerns by informants. In this paper, we also use pseudonyms to ensure confidentiality.

In our analysis of data, in order to understand the nature of collective PES arrangements on the ground, we paid attention to factors that can affect perception/behaviors of individuals as well as collective action outcomes, including history of the villages; heterogeneity among households within groups (age, ethnicity, education or economic levels); changes in forest management and the evolution of communal tenure; the role of local customary institutions; and local forest use and livelihood practices. We also examined physical differences in forests across the researched provinces (see Table 4). However, because our interest was in the institutional forms of PES in practice and the social and collective action outcomes, we did not try to evaluate the program's effectiveness on forest conditions independently, although we did ask in stakeholder interviews about the perceptions of forest changes. In addition, the use of a case-study approach here also does not allow for teasing out cause-effect relations between PES model types and the outcomes, calling for further research on these aspects.

4. Results

4.1. Three models of collective PES

We discuss below how PES has been incorporated into CFM at the local level, using Ostrom's (1990) set of collective action principles for well-established rules, laws, and relational processes to examine the outcomes: these include setting clear boundaries for the resource and resource users; use of local knowledge; local networks that actively build trust and make decisions; environmental monitoring coupled with processes for feedback; and mechanisms for conflict resolution (cf. Saeed

Table 3
Summary of methods across study sites.

Province	Districts/Communes	Total villages surveyed	Number of HH surveys	Number of FGD	Number of stakeholder interviews	Time period of work
Kon Tum	Hieu Commune, Kon Plong district	4	100	4	20	2011–2014 2016, 2020
Thua Thien Hue	Huong Nguyen Commune, A Luoi district	4	90	4	27	2019 – present
Lam Dong	D'ran Commune, Don Duong district and Da Chais commune, Lac Duong district	5	74	5	25	2011, 2012, 2014

Table 4
Site information for case study provinces.

	Total Forestland (ha)	Forest cover (%)		Type of forest (ha)	Forest ownership (%)					Primary local perception of drivers of deforestation and degradation	PES area (ha)	Number of PES beneficiaries					
		Natural Forest		Plantation Forest	State forest owners (SFOs)	Army	CPC[1]	HHs, groups of HH and Communities	Others			SFOs	Non-SFOs	CPC or District Forest Protection Units	Individual HH contracts	Communities (Groups and entire villages)	Third-party contracts
Lam Dong	539,364	54.5	455,226	84,138	70	14	2	1	11	Cash crop (coffee) expansion, illegal logging	320,970	30	65		1517	6	13,742 HHs and 33 villages
Kon Tum	621,079	63	547,803	73,276	70.6	0.9	14.4	8.9	5.2	Cash crop (cassava) expansion, NTFP collection	387,781	23	-	74	5137	26	1523 HHs, 160 groups of HHs and 156 villages
Thua Thien Hue (TTH)	311,206	57.37	211,373	99,833	57.63	1	18.19	22.6	0.58	Small-scale acacia plantation expansion illegal logging and encroachment	153,958	9	-	4	295	282	23 HHs, 29 groups of HHs and 4 villages

Sources: Nguyen, 2011; Lam Dong Fund, 2020; MARD, 2020; Kon Tum Fund, 2017 and 2020, TTH DARD 2016, Thua Thien Hue Fund, 20.
[1]Communal People's Committee (CPC) or local authority.

et al., 2017). Additionally, we review different socio-economic factors and contexts, such as the size of groups and forest tenure regimes, and local conceptions of equity in benefit-sharing.

4.1.1. *Model 1: Community forests and collective PES in Kon Tum province*

Hieu commune is located in an isolated valley in Kon Tum province and is the traditional home of the M'Nam ethnic minority people.[2] In 1995 a Forest Land Allocation Program (FLA) began in which State Forest owners assigned forests to individual households with protection contracts of no more than 30 ha/household. The participants received payments of 60,000–100,000 VND/ha/year (4–5 US$/ha/year) to protect the contracted areas and prevent outsiders' use of the forests. The local villagers also received permission to harvest timber and NTFPs for home consumption. Yet these individual HH contracts created a new concept of individual rights, which did not fit with the collective rights in the old customary system (Nguyen, 2014).

Later, a new CFM model was piloted in 2007 with support from JICA (Japan International Cooperation Agency) to revive the collective customary system to both protect forests and gradually improve villagers' livelihoods. The entire village would collectively hold a land-use rights certificate, receive a share of the revenues from sustainable commercial timber exploitation, and 5 % of forestland could be used for swidden cultivation. However, in reality, local authorities did not allow villagers to convert forest land for cultivation and no commercial timber extraction was carried out, so the model was considered a failure (Nguyen, 2014).

In 2011, a new project called "REDD + Community Carbon Pools" implemented by Fauna and Flora International (FFI), began to try again to transfer legal tenure rights for 18,700 ha forest from State agencies to local villagers collectively and to recognize customary norms and rules, with the hope to produce carbon credits in the future. To pursue communal land titling, FFI undertook various preparatory activities, ranging from participatory land use planning, forest inventory and allocation, community forest use and management regulations, and the establishment of forest protection management boards and benefit sharing mechanisms. However, at the end of the project in 2014, only one village had formally received a land tenure certificate, while at the same time, strict rules to avoid deforestation and forest degradation were already in place. In order to maintain the motivation for local people to participate until they get carbon certificates, the project paid forest patrol teams in 11 villages 200,000 VND/ha/year (8–9 US$/ha/year), equivalent to the price of a carbon credit in the voluntary market as of 2013–2014. The payment continued in 3 villages after 2014 with additional support from a new KfW10[3] project, and will continue for several years until they will be able to sell carbon credits. In addition to this NGO project revenue, since 2014, the national PES fund has paid further monetary benefits of 460.5 million VND per year (20,000 US$) for 1,008 ha. All of these PES revenues are pooled into community funds which have their own benefit sharing mechanisms (see below). Two additional villages received collective land use certificates, or Red Books, in 2019 and planned to receive PES payments in 2021.

In order to receive the forest protection funds, all households of the village need to sign a forest protection agreement with the NGO project (first FFI, now KfW10), the local authority, and the provincial PES fund to confirm their desire to participate and commitment to comply with all regulations. One CFM board in each village has been set up, voted on by

[2] [2] M'Nam are also known as Xo Dang, and one of the 54 officially recognized ethnic groups in Vietnam. Approximately 61.8 percent of the national Xo Dang population resides in Kon Tum province, where they comprise 24.4 percent of the province's total population. Source: Vietnam General Statistics Office (GSO), 2020.

[3] [3] KfW10: The project on protection and sustainable management of forest ecosystems in the wider Central Highlands regions, Vietnam, funded by the German Development Bank.

household representatives. A professional forest protection team was also selected, with 18 members voted in, who are trained and paid a monthly salary (1.1 mil VND/month/person, or 48 US$/month/person). Once or twice a month, the team conducts patrol activities with 8–10 rotating members [interview, 2020]. 10 % of the remaining pooled PES funds will be used for village microfinance funds for collective purposes (e.g., village meetings or cultural events) and assisting poor households in obtaining loans of up to 7 million VND/HH (300 US$). Any remaining money will then be divided equally among all household members. The average household share of the collective PES scheme received in 2019 was 1.6–2 million VND (70–87 US$), accounting for on average only around 5–6 % of yearly household income, according to our household survey results. The majority of income for local livelihoods comes from wet rice cultivation, commercial cassava cultivation, firewood and non-timber forest products (NTFPs) collection from the community forests (cf. Nguyen, 2014; McElwee et al., 2017). The recent boom in industrial cassava and commercial NTFP harvesting have enticed the M'Nam people in Hieu commune to expand their cassava production areas and over-harvest NTFPs in these community forest areas (cf. McElwee et al., 2017; Nguyen, 2014; To et al., 2016, To et al., 2017). These activities can be considered as the main threats to forest protection efforts.

4.1.2. Model 2: Group forests in Thua Thien Hue province

Our second case study is Huong Nguyen commune, Thua Thien Hue province, where the local community, mostly Katu people,[4] was resettled in 1996 as part of the government's policy to move swidden agriculturalists out of protected forest zones in a hydropower watershed and closer to infrastructure like roads. The commune is quite small with only 4 villages (348 households), 34 % of which are classified as poor and near-poor (Huong Nguyen CPC, 2019). Livelihoods combine crop cultivation (rubber and acacia plantation), livestock husbandry and limited off-farm work with remittances from individual household members who migrated to work in urban areas. A forestland allocation program in 1997 provided support and incentives to plant mostly acacia trees, leading to changes in access and control of forests. The nearby forestlands were enclosed into private claims by individual households by reclaiming through forest land allocation (legally) and encroaching (illegally) to expand farms. A boom in smallholder commercial acacia tree plantations has led to increasing tensions in land-use management and pressures to convert nearby natural forests, including group forests (Nguyen & Kull, 2022).

In 2011, as part of the implementation of PES, local people were allocated nearly 1,100 hectares of natural forests which used to belong to A Luoi State Protection Forest Management Board, with official land-use certificates given to 22 groups of HHs (with on average 10–12 HH per group). The groups were organized rather than the entire community because clans remain the strongest social ties, particularly in land-sharing practices, so small groups among intimate family members, kin and neighbors were anticipated to result in higher uniformity, consensus, and preferences of group members. Additionally, in the context of new income opportunities offered by industrial acacia expansion, individually allocated forests were seen as at risk of being converted into acacia.

The groups were formed on the basis of voluntary registration among members, who manage a forest area of 40–50 ha. In each group, the leader is often the head of a clan or elected by members, and acts as a representative, coordinating activities and distributing benefits among members. Depending on the group, some patrol their allocated plots every 2 weeks, some only once a month, while several others have never patrolled. Group rules related to forest management, which detail local activities allowed, have not yet been discussed in many groups or between groups. Further, only 63 % of the commune's population is participating in these groups. The remainder that does not participate are often those who do not have enough labor, such as the elderly or single mothers, households who work far away from the locality, and villagers who did not register because they were busy with other livelihoods (as in commercial tree plantations) and did not expect to receive payment from forest protection.

Each participating household in our survey received on average 1.8–2 million VND per household/year (78–87 US$/HH/year), accounting for 12–13 % of yearly household income. In some groups, PES revenues are divided equally among members while in other groups, different benefit sharing mechanisms are in place. During the year, the group PES funds are usually retained in a bank account for interest or will be lent to members when needed. In addition, the legal security of the group's land-use certificates has encouraged household members to mobilize PES revenue and external investment for planting rattan or other medicinal plants in group forests. This has helped bring about not only enriched forest quality but also new income sources for the future. The local authorities have also requested that each group contribute 1 million VND/group/year (45 US$) to contribute to the local microfinance fund in order to obtain more collective benefits for the entire commune.

4.1.3. Model 3: Third party contracts and group patrolling in Lam Dong province

Our final case study is from 2 communes (D'ran in Don Duong district and Da Chais in Lac Duong district) in Lam Dong province, which is the traditional home of the K'Ho people.[5] Forests have played an important role in the cultural identity of the K'Ho, but the devolution process of forest management to local communities has been nearly non-existent in Lam Dong, accounting for only 3 % of the province's total forest area, while the rest remains under state ownership (Lam Dong Fund, 2020). Thus, collective PES has required third-party forest protection contracts in this province. Groups of 8–12 HHs, who tend to live near one another or are relatives, are led by a group head (*to truong*) and sign a formal yearly contract with state forest owners (such as National Parks or Watershed Forest Management Boards) and agree to regularly patrol the specified area, prevent forest fires, and report outsiders. For example, one contract we inspected specified the group head (Mr. Thien), the forest area to be protected (246.5 ha), the location of the forest, a list of households in Mr. Thien's group, and the total amount paid to the group per year (400,000 VND/ha in 2011 × 246 = 97,040,000 VND). No land tenure rights are conferred with these contracts, and violations would void the agreement, including not carrying out required forest activities or degradation of the assigned forest due to failure to report violations. Breach of contract would be met with denial of PES funds for a specified time depending on the seriousness; however, for any deforestation of more than 1 ha or loss of timber greater than 5 m^3, the group would lose their contract, which would then be assigned to another. Such cases have been rare, however.

Groups were both self-organized and selected by the contracting state forest owner in different places. For example, Bi Duop National Park selected which communities on its border should participate, and then let local community leaders designate which households would be in what groups. Therefore many of the PES group contracts went primarily to those households that had previously participated in other forest planting and protection programs with local authorities dating back to the early 1990 s. Around 10–25 % of people in studied villages did not join group contracts, and the most common reasons given was

[4] [4] Katu people (also Co Tu) are one of 54 ethnic groups in Vietnam. About 102,551 Katu people who live in eastern Laos (in Sekong province, along the upper Sekong River) and in the Central Vietnam (in Quang Nam and Thua Thien-Hue provinces) (Source: GSO, 2020).

[5] [5] K'Ho also known as Co Ho, is one of the 54 officially recognized ethnic groups in Vietnam. They are also related to the Cho Ro and Ma people. K'Ho are an ethnic group living in Vietnam's Central Highlands, mostly in Lam Dong province. Source: GSO, 2020.

that the household had not been asked to participate by local authorities or by group heads (due to lack of labor or perceptions the household could not fulfil duties), or else the PES roster was already full.

Lam Dong province paid 500,000–600,000VND/ha/year (21–26 US $/ha/year) for PES funds at the time of the survey, and the average household income received in 2014 for participating in a group contract was 17,031,250 VND (~ 750 US$) according to our household survey, accounting for on average around 20 % of yearly household income (thus considerably higher than in the other two cases).[6] Groups usually followed a set patrolling schedule that rotated among the members, so that on any given week several (though not all) households would go to the forest to patrol. Depending on the community, the groups monitored forests on a weekly, biweekly, or even monthly basis for forest fires and evidence of outsiders. Rangers working for some of the state forest owners often helped organize the patrol watches and supervised the weekly schedules for the PES groups, rather than letting them self-organize (see Table 5).

4.2. Local perceptions of costs and benefits from participation in collective PES

Across the three case studies, there were varying perceptions of the benefits of participation. In Lam Dong (model 3), 72 % of households surveyed said their main priority for participating was to receive household payments, with only 2 % interested in community benefits, such as "access to land rights" or "to improve community social relations", as there were no options for community benefits within PES contracts, with the only collective component being group patrols. In the other two projects, there was higher awareness of and interest in community benefits. The message of "protect forest for selling carbon" in Kon Tum had raised hopes of gaining more benefits, and to achieve that goal, villagers agreed that commonly-held forests could be protected by the entire village for the collective good. Many households, especially those lacking land, were willing to shift livelihoods to remittances and away from swidden agriculture to ensure compliance with forest protection rules, particularly in anticipation of higher future carbon payouts (cf. Nguyen, 2014: McElwee et al., 2017). The active participation and equal distribution of PES revenues along with other support, such as community land titles, professionalization of protection teams, and the community micro finance fund continued to strengthen that belief: one village leader noted "*although the current payment is not high, it is said that the project will support us to get carbon credits next year, the income will increase. So, we still try to protect the forests*" [interview, 2020].

In models 1 and 2, where households did not receive large individual payments from PES, innovative approaches to pool some PES funds had allowed them to enjoy collective benefits, like group and community loan funds. Further, access rights to NTFPs were an important benefit across model 1 and 2 (in model 3, PES payments were considered higher than NTFP benefits and so NTFP use was very low), and the ability to enrich community forests with additional economic plantings (e.g., rattan in model 2) further raised the prospect of improved benefits in the future. Recently, with the support of a number of NGO projects and local forest rangers, PES groups in model 2 have also worked together to build appropriate forest patrol routes and detailed plans, helping to reduce staffing, take advantage of teamwork, and reduce risks during forest patrol activities.

Yet while two of the three different collective PES models have provided both individual and some community benefits, at the same time, there remained pressures to convert forests for cash crops (in model 1 and 3) and commercial acacia plantations (in model 2) for even higher financial gain. In the sites with low PES payments, recipients considered it too low to cover their opportunity costs. For example, in model 1 in Kon Tum, the difficulties of making a living under the strict rules had affected poor and landless households, whose main income sources were restricted, and according to our survey, the first years of the project saw declines in local livelihoods as PES payments were not enough to compensate for rising opportunity costs. In model 2, many households perceived little direct benefit from protection of the forest; as one community leader said, "*This forest is very poor. If we convert these poor forests into acacia plantation, we can earn 40–50 million VND/ha/3 years, much higher than 400,000 VND/ha/year of PES…*" [interview, 2019]. Each person only earned between 100,000–150,000 VND per day (5–6 US$/day) through patrolling, half of what they can earn for wage labor in other activities. Thus, the payment is considered not worth the effort; "*the payment is too low while patrol activity is dangerous if you meet illegal loggers"* said one village head [interview, 2019].

These pressures were compounded by low conditionality across the models. While in all three cases regular patrols were supposed to take place to identify violations of forest protection rules, these took place at variable intervals, and sometimes violations were only discovered long after the fact with no clear perpetrator (e.g., in cases of illegal logging or encroachment). Across all models, there were few provisions to make payments truly conditional upon conservation performance or outcomes. In model 3, the local state forest owners that contract out protection to households will conduct regular checks of forests, with possible non-renewal of contracts if large violations were found, while in the other two models there was little direct oversight. In the case of Kon Tum (model 1) and Thua Thien Hue (model 2), villagers needed to make sure that their allocated areas do not decrease in overall forest cover so they will receive the full payment. If forest loss occurs, they will only be deducted the corresponding PES amount for the lost forest area, without any other legal responsibilities (e.g., loss of tenure certificates). Maintaining the quality of forests (in the case of forest degradation) was generally not considered or monitored across all three models.

4.3. Institutional setting and inclusion/exclusion in collective PES models

In the three cases, the institutional setting of collective PES models varied. In model 3, group patrols reduced individual workloads, and because patrolling was either specified in the third-party contracts or organized by the State Forest owners in conjunction with their own professional ranger services, there was little need for the groups to come up with their own rules or enforcement. In model 1, many years of outside project support had finally gotten the villages to work together to protect the community forests to which they had obtained title, but this required significant outside NGO and donor help. In model 2, where groups were self-organized by neighbors and kin, there was a lack of rules, norms, and sanctions to force members to comply or change their behavior, and no common set of rules among PES groups had developed organically and thus needed to be supported by recent NGO involvement to build group plans.

In addition, collective PES has also led to collective conflicts in some cases. In model 2, the establishment of 22 forest PES groups inadvertently revived the concept of clans and families' rights, which previously had eroded, leading to new boundaries and exclusionary rules by the groups over areas previously believed to be common. This had led to some being unable to participate in the groups: "*I also want to join in the group. But they said they are allocated a small area. It is not enough to share if there are too many members*", said one non-PES household. Households in model 3 that were not part of patrol groups complained as well that they were not selected because they did not have a history of participating in previous forest management projects, and blamed village leaders and state forest owners for favoritism.

These challenges have led to concerns about the collective models' effectiveness among both officials and participants. We did not independently assess how forest quality outcomes had changed under PES, but there were concerns about continuing forest degradation when there

[6] [6] Income figures were derived from recall on all sources of household income and expenditures in surveys, which were then averaged across the household sample, and the means reported here.

Table 5
Comparison of the case studies.

Model and site	PES payment rate Per hectare and average per household/ year	Organization of collectives	Land tenure and type of forest	Legal rights[1]	Forest management actions/activities	Benefit-sharing mechanism
Model 1: Community PES model in Kon Tum	9 – 21 US $/ha/year 70–87 US $/HH/year	Entire village (70–120 HHs)	Communal land title to natural production forests	Land tenure certificate for 20–50 years to the entire village. Only have management and protection rights Not allowed to sell, lease, but can inherit. No timber harvesting, no conversion to other purposes but sustainable NTFPs through new rules for community members. Allowed investment only to plant native and/or non-timber species to enrich the quality of forests.	Weekly or monthly patrols by forest protection team Devise new communal rules on duties and benefit sharing	Professionalized forest protection team with monthly salary Remaining revenue is divided equally among village HH members Potential for future carbon sales on voluntary or compliance market. Expanded collective benefits through a community micro-finance fund.
Model 2: Group forest PES model in Thua Thien Hue	17 US$/ha/ year 78–87 US $/HH/year	Group of HHs (10–15 HHs)	Group land title to natural production forests	Land use certificate for 20–50 years to each specific group of households. Other rights and requirements are similar as in Kon Tum case	No specific forest patrol plan, depends on groups No communal rule is set up, only consensus among small groups.	Group received PES money through group leaders; divided equally among members in groups Potential for future medicinal plants and rattan plantation in group forests. Additional collective benefits via community microfinance fund.
Model 3: Contracts and Forest Patrolling in Lam Dong	21–26 US $/ha/year ~ 750 US $/HH/year	Groups of HHs (8–12 HHs)	No land tenure, patrolling contracts only to natural special-use and protection forests	Generally-one-year renewable contracts Depending case-by-case, forest development on allocated land with communities is allowed (e.g. allowances for restoration or replanting) No use rights to forests rather than NTFPs and dry firewood.	Weekly or monthly patrols of assigned forest area, checks by state forest owner Formal rules and regulations specified in contracts from state forest owners	Group received one lump sum; divided equally among members by group head No additional collective benefits

from To & Tran, 2014 and fieldnotes 2013, 2019.

were conflicts, misunderstandings, or negative perceptions. As villagers in model 2 explained, the local "land hunger" to access new farmland for commercial acacia plantation had made it increasingly difficult to get consensus among the group members and between the groups: "they [another group] protect their group forests but encroached into our forests" said one group member. Further, those excluded from PES participation felt resentment, with one stating that "we are complying, but they do not. Then they have land, we are landless". As a result, provincial officials complained that the lack of rule enforcement among villagers had led to continuing illegal encroachment and "the worst PES implementation area in our province" [interview, 2019]. While some similar conflicts with those who were excluded from protection contacts in model 3 were reported, state owners also reported that PES had offered opportunities to meet with villagers more regularly (such as when contracts were signed); officials at Bi Duop National Park reported that there had been far fewer cases of illegal logging and arson after PES implementation, which they attributed to "better feelings" between the two sides, aided by the considerably larger PES payments there.

5. Discussion: PES and collective action outcomes

In this section, we look across the three PES models for lessons learned about different collective action approaches and discuss the factors that influenced successes on the ground and note where lessons learned might apply to other contexts outside of Vietnam.

5.1. Collective and individual benefits

Each of the case studies shows variation in how households, groups and communities received financial benefits, which depended on local geography and forest resources, type of project, resource use practices, and organization of the communities. In all three cases, *collective patrolling* enabled villagers to work together in forest protection over larger areas, thus reducing the overall cost of monitoring. This is particularly relevant given concerns about opportunity costs; if households were expected to do all the monitoring, rather than groups which shared the duties and were able to reduce the amount of labor needed by any one household at a time, PES projects would likely be seen as less advantageous. The benefits of the collective mechanisms also included *smaller transaction costs* for authorities, as they only have to deal with village leaders or group heads in contracts and enforcement. The focus on collective patrolling is relatively unique globally, and is a potential lesson learnt for other countries, where a lack of monitoring has hampered PES implementation (Fisher et al. 2010). In the Vietnam case, the communal patrolling monitored violations of contracts or signs of degradation as well as contributing to some collective sense of obligations, and was one of the more successful parts of all 3 models.

In terms of individual household versus collective benefits, there were differences between the models. In model 3, the fact that forests are extensive, not fragmented and owned by one state agency accounted in part for the larger areas to protect and thus the higher revenues.

Payments were divided equally to households, and mostly perceived as paying for the labor of patrolling rather than being paid to provide ecological services. Thus, for these groups, it was important that there was a clear determination in how the labor was organized and compensated for equitably (namely through weekly/monthly patrol schedules and enforceable legal contracts), but beyond this, there were no further collective rules nor community benefits. The findings of the other two case studies, however, point out the advantages of collective PES arrangements in terms of providing a range of both individual and group benefits. In both model 1 and 2, communities received at least a small amount of pooled PES funds which were used to pay for revolving credit funds with the potential to benefit community members beyond those directly involved in PES activities.

Yet it is often the model 3 (with no community benefits) that is used as a positive example of the success of the PES program by the government, because it pays some of the highest household financial benefits nation-wide and can claim to be in part aimed at reducing poverty (McElwee & Nguyen, 2015). However, model 3 is not one that can be replicated in many other areas of Vietnam (due to forest fragmentation elsewhere), nor does the model provide for long-term collective action motivation or community benefits. Rather, there is a need to acknowledge that other collective action models may make more sense elsewhere in Vietnam, and it would be particularly strategic to use PES revenue collectively for several priorities: (1) areas with poorer forests, as individual households would incur excessive time commitments to improve them (PanNature, 2019); (2) in areas with pressures for land conversion, as the model 2 showed, as collective responsibility can discourage conversion (although not always); and (3) in areas with poor outcomes from prior CFM projects, as the collective PES model can increase consensus among community members, even with low payment levels, as was the case in model 1. Such lessons apply elsewhere as well, where prior histories of common-pool resource management have clear influences on later PES outcomes (Gómez-Baggethun et al., 2013), and which could be harnessed for improved PES institution-building, particularly where privatization has proved unworkable (Unnikrishnan & Nagendra 2015). At the same time, there needs to be an awareness of the challenges of collective models in leading to satisfactory participation and community benefits, as we note below.

5.2. Land tenure and rule-making outcomes

Existing research usually has pointed out that transferring sufficient property rights to local users and communities is crucial for incentivizing them to manage forests sustainably (Sikor & Nguyen, 2011; Ironside, 2017). But two out of three of our case studies show that transferring collective property rights is not in and of itself a panacea for achieving collective action outcomes, and that sometimes no land tenure title but PES financing can still motivate action. For example, in model 3, even though households did not have title or tenure over lands that they receive PES payments for, they were sufficiently satisfied by the relatively large payments not to feel any need for communal title requests for these lands (also, they would have been unlikely to receive them even if they had asked).

For the two communities with communal land tenure (model 1 and 2), they have faced challenges in translating their legal rights into effective forest management responsibilities, showing that moving from secure collective tenure to collective rulemaking is not an easy path, even with the financial support of PES. In both sites, there was still confusion over the legal framework for an entire community holding tenure rights, and questions about whether the local community was a legal property holder with rights to civil transactions as regulated in the Civil Code. This had led to challenges in model 1 in terms of seeking to safeguard the rights of the local community to sell carbon credits in the future, and what form those future contracts might need to take. Additionally, the communally titled forests in both sites were not a return to the customary laws of the past but were artificially created to satisfy the needs of PES and other projects. For example, the forests in model 1 were fragmented into 11 different pieces corresponding to the 11 current villages, while in the traditional customary system, all forests would be accessed and controlled in an integrated way. Consequently, instead of helping to clarify rights over forest and land, PES payments may add an additional layer to an already complex property system.

Globally, communal land tenure has been pointed to as having pre-existing rules of access and enforcement that then might be successfully 'transferred' to the PES activities (Hayes et al., 2019). However, lessons from Vietnam, particularly the case study in TTH (model 2), reveals that this is very challenging where interruptions in tenure or shifts in settlements have occurred. Even though the groups had full land-tenure titles, these rights were conferred to forests with which communities had a limited history (since they were resettled in the 1990 s), the forests were generally of poor quality, and pressures from commercial acacia plantations had led to questions about the point of forest protection and dissatisfaction with smaller payment sizes. Furthermore, issuing land title to groups can facilitate processes of accumulation and dispossession among kin, family members, and neighbors, even among those who share common histories and social interactions (cf. Hall et al., 2011). For example, in some groups, individual households had invested in planting rattan in the group's common forests and perceived these as their 'private' property. Thus, competition for land use within groups, among the groups, and between participants and non-participants has the potential to produce new tension and conflicts, which land titles may exacerbate rather than relieve. The fact that both model 1 and 2 had required additional support from NGOs to devise rules and benefit-sharing plans on top of the formal tenure rights indicates that intermediary organizations are likely to be important to overcome these challenges, a finding that mirrors work both in Vietnam and globally showing how important intermediaries are in improving PES outcomes in general (Pham et al. 2010; Schröter et al. 2018).

5.3. Collective action outcomes

Social interactions are critical within collective processes, given that "social norms of reciprocity, trust and enforcement in mobilizing collective work" (Sturtevant, 2006) are needed. In this, pre-existing social capital could help improve PES outcomes. Further, collective consensus and commitment within PES design have the potential to increase social capital outcomes by creating a legitimate structure for stakeholders to coordinate with one another and with authorities with the goal of creating equity and equality. However, as many have pointed out, a community is not a homogeneous unit, and members of communities have differences in wealth, endowments, economic interests in types of resources or ecosystem services, and social-cultural backgrounds (Agrawal & Gibson, 1999). These differences can shape trust, social capital and perception of the costs and benefits, which will also influence the degree to which communities and individuals choose to participate in PES. Active participation in decision-making and compliance with PES regulations in our cases largely depended on a household's socio-political position within the community, community size, the experience of the community in previous forest protection programs, the degree to which the community's livelihood depended on forests, their ability to self-organize or benefit from the legacies of traditional customary systems, and support from state or intermediary NGO agents. Such findings mirror the complexity of other collective PES programs and common-pool resource management elsewhere, where easily replicable or one-size-fits-all 'models' are hard to find (Fisher et al. 2010; Kolinjivadi et al. 2019).

Our collective PES case studies struggled to get full inclusion and commitment among communities when not every-one directly benefited, as well as difficulties in reaching consensus on carrying out collective forest protection activities and benefit distribution. Overall, despite new funds, communities struggled to set up common institutional arrangements and procedures for operational rules, whether due

to restrictions on rights (as in model 3), lack of community agreement (model 2), or the costs incurred in giving up short-term household practices for longer-term collective benefits (model 1). In model 3, some households not included in the patrol groups were not financially benefitting, primarily due to authorities picking households that had participated in past projects, and there was no sense of collective benefits from PES. In model 1, while the new PES approach did not match traditional forest management practices, nonetheless it helped create cohesion and consensus among community members in participating and complying with regulations; even though the payment level was not very high, the desire for Red Books and forest carbon revenue in the future played a motivating role. In model 2, individual members of groups could get benefits, but distribution was not based on their real contribution to forest patrols or resource use behavior changes, and free-riding appeared common, even in small groups, indicating how difficult it is to achieve harmony in collective PES when payments are low, individuals have a desire to increase their access to land, and social cohesion is diminished (as had happened after resettlement).

All three models had trouble establishing effective agreements and legitimization of rules in use or drawing on other cultural/spiritual benefits such as social cohesion and solidarity, despite PES funding, and in some areas like model 2, potentially because of it (due to disagreements about benefit-sharing or exclusion from resource rights). Increased forest protection required for participation in PES imposes a management responsibility upon local people, many of whom may be primarily interested in enhancing their individual household livelihoods. In these cases, households likely need more collective social benefits to outweigh the relatively modest household benefits from PES, or in the case (like model 3) where household benefits were large, increasing community benefits would have increased social capital connections and likely contributed to more cohesion across contracted protection groups (who currently work independently). Thus ideally, there would be a combination of collective and individual benefits together in collective PES schemes (see Fig. 2). Yet the majority (more than 90 %) of all PES contracts in Vietnam remain signed by individuals who receive fairly low payments, with little collective benefit received, outside of improvements in environmental services provisioning (Pham et al., 2013).

6. Conclusion: Improving collective PES models in Vietnam and globally

Despite a national law and uniform payment rates across the whole country, flexibility around organization of service 'sellers' and beneficiary payments have led to a patchwork of models to use PES funding for CFM in Vietnam. The three case studies we examined varied in terms of how much collective action was involved, with PES financing fostering willingness and ability to work collectively and strengthened resource conservation among some, but not all, members. None of Vietnam's collective PES models have achieved unqualified success in generating positive collective action, and each has challenges that have undermined group efforts, exacerbated underlying problems, or even created new conflicts. For example, people undertook some collective PES work but were not always driven by voluntary pursuit of shared interests, primarily because not every-one saw the value of forest protection or benefits from conservation, making truly collective action challenging. Despite increased legal rights for forests in 2 out of 3 cases, and despite increased funding and benefits for many (if not all) households in all 3 case study areas, there remain challenges in fitting collective PES to the prevailing economic and livelihood aspirations of the majority of individuals.

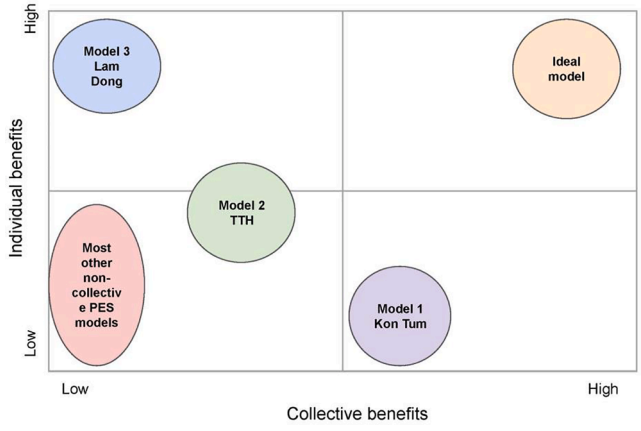

Fig. 2. Potential interaction of individual and collective benefits in PES models in Vietnam.

Based on the above findings, we argue that in order to achieve stronger collective action outcomes for PES in Vietnam, there is a need to achieve acceptable financial benefits for the large number of people working together, while on the other hand, there needs to be sensitivity to variation within collective arrangements and benefits, recognizing the variety of interests that members may have. Each of our cases demonstrated the need for flexible governance arrangement beyond 'top down' and 'one size fits all' so that collective PES enables the emergence of institutions capable of overcoming the many constraints faced in Vietnam, from histories of dispossession, poor outcomes from previous community forest models, and competition for land.

Despite enthusiasm for linking ecosystem service provisioning, PES models, and common property and collective action in theory (Swallow and Meinzen-Dick, 2009; Rodela et al., 2019), our research confirms that such linkages can be extremely challenging to implement. Each of the three models had some positive elements, while others were insufficient, indicating that overcoming collective action dilemmas, even with PES money, remains a challenge, and there remains much work to do on this in Vietnam. Further, our evidence questions the idea that PES can easily 'piggyback' on existing CFM or other community-based models, or that the additional PES financing alone can help create appropriate rules to ensure optimum resource use, beneficial collective action, or build social capital. We argue here that 'institutional crafting' in collective PES is like that of CFM in general – it should reflect the complexity, diversity and ad-hoc nature of institutional formation in practice (cf. Cleaver, 2002). Design, implementation, monitoring, and evaluation processes will likely require consistent revisiting to leverage the effectiveness of collective PES models.

Collective action needs to match people' aspirations and the effort they are willing to put into the management of common forests, otherwise, new conflicts among members may arise, driven by varying perceptions on participation, motivation, and compliance among and within groups. Thus, our key findings are that collective forest management under PES does not need to follow a fixed shape—as we noted with a variety of land tenure, benefit sharing systems, and payment rates in our case studies—but it does need to be a result of process considered locally legitimate and will likely need institutional support (such as through intermediaries) beyond PES payments alone. The considerable variation across the sites in terms of communities' ability to successfully organize and formalize collective action activities, particularly where there was strong pressure for privatization of resources and influence of market forces, calls for flexibility and adaptive mechanisms, supported by NGOs or other actors. Additional efforts to improve existing local institutions' capacities and reinforce group cohesion to achieve collective action success are needed, but the existing PES system has not yet been able to support these efforts systematically, which will remain a challenge going forward unless formally addressed in policy and practice.

Declaration of Competing Interest

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