



# **MAKING PES WORK FOR VIETNAM**

A multi-scale policy analysis of payments  
for forest environmental services

**DO TRONG HOAN**

## **Propositions**

1. The neoliberal logic of the policy design of Payment for Forest Ecosystem Services (PFES) is not reflected in its implementation in Viet Nam.  
(this thesis)
2. If PFES in Viet Nam could provide incentives to sustainable land use practices outside the institutionalised forest lands, greater landscape multi-functionality would be achievable.  
(this thesis)
3. Evidence indicating higher citation rates of open-access publications justifies the policies to support this approach.
4. Epistemic trust in climate science needs to be enhanced through interdisciplinary collaboration.
5. Making human relations with nature explicit enhances social cohesion.
6. The Hora Finita software used by Wageningen University represents unfinished business in soliciting and addressing user feedback.

Propositions belonging to the thesis, entitled

Making PES work for Vietnam – a multi-scale policy analysis of payments for forest environmental services

Do Trong Hoan

Wageningen, 3 October 2023

**Making PES work for Vietnam**  
**a multi-scale policy analysis of payments**  
**for forest environmental services**

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**Making PES work for Vietnam**  
**a multi-scale policy analysis of payments**  
**for forest environmental services**

**Do Trong Hoan**

**Thesis**

submitted in fulfilment of the requirements for the degree of doctor  
at Wageningen University  
by the authority of the Rector Magnificus,  
Prof. Dr A.P.J. Mol,  
in the presence of the  
Thesis Committee appointed by the Academic Board  
to be defended in public  
on Tuesday 3 October 2023  
at 1.30 p.m. in the Omnia Auditorium.

Do Trong Hoan

Making PES work for Vietnam – a multi-scale policy analysis of  
payments for forest environmental services,

324 pages.

PhD thesis, Wageningen University, Wageningen, the Netherlands  
(2023)

With references, with summaries in English and Dutch

ISBN: 978-94-6447-843-3

DOI: 10.18174/636587

For in the true nature of things, if we rightly consider, every green tree is far more glorious than if it were made of gold and silver.

- *Martin Luther King Jr*





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# List of abbreviations

3PAD	Pro-Poor Partnership for Agroforestry Development Project, Vietnam
AGB	Above-ground biomass
ACIAR	Australian Centre for International Agricultural Research
BAU	Business as usual
C	Carbon
CO <sub>2</sub> eq	Carbon dioxide equivalent
CES	Commoditized ecosystem services
CIFOR	Center for International Forestry Research
CIS	Co-investment in landscape stewardship
cm	centimetre
cm <sup>2</sup>	square centimetre
COS	Compensation for Opportunity-Skipped
CPC	Commune People's Committee (Vietnam)
CVM	Contingent Valuation Method
DARD	Provincial Department of Agriculture and Rural Development (Vietnam)
DCE	Discrete Choice Experiment
DIA	Discursive-institutional analysis
DONRE	Provincial Department of Natural Resource and Environment (Vietnam)
DPC	District People's Committee, Vietnam
ES	Ecosystem services
FAO	Food and Agriculture Organization of the United Nations
FCPF	World Bank's Forest Carbon Partnership Facility
FES	Forest Environmental Services
FIPI	Forest Inventory and Planning Institute (Vietnam)
FLA	Forest land allocation

FMBs	Forest Management Boards (Vietnam)
FOLU	Forestry and Other Land Uses
FPDF	Provincial Forest Protection and Development Fund (Vietnam)
FPS	Forest Protection Station
GHG	Greenhouse Gas
GIZ	German International Cooperation
ha	Hectare
ICRAF	World Agroforestry
IFAD	International Fund for Agricultural Development
IPBES	The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
KII	Key Informant Interviews
km <sup>2</sup>	Square kilometre
KWh	Kilowatt hour
LEK	Local ecological knowledge
LULUCF	Land Use, land-use change and forestry
LUMENS	Participatory Land Use Planning for Multiple Ecosystem Services
m	metre
m <sup>2</sup>	square metre
m <sup>3</sup>	cubic metre
MARD	Ministry of Agriculture and Rural Development (Vietnam)
MEA	Millennium Ecosystem Assessment
MONRE	Ministry of Natural Resources and the Environment (Vietnam)
Mt	Megaton
NDC	Nationally Determined Contribution
NGOs	Non-governmental Organisations
NORAD	Norwegian Agency for Development Cooperation
NRAP	National REDD+ Action Programme
NTFP	Non-timber forest product



PCA	Principal Component Analysis
PES	Payment for Ecosystem Services
PFES	Payment for Forest Environmental Services (Vietnam)
Pg	Picogram
PIM	Policies, Institutions, and Markets Programme of the Consultative Group on International Agricultural Research
REDD+	Reducing Emissions from Deforestation and Forest Degradation in Developing Countries
RQ	Research question
SE	Standard error
SFE	State-owned Forest Enterprise
SFM	Sustainable Forest Management
SP	Stated preference
STNR	Song Thanh Natural Reserve (Vietnam)
tC/ha	tones of carbon per hectare
UN	United Nations
UNDP	United Nations Development Programme
UN-REDD	United Nations Collaborative Programme on REDD
USA	United States of America
USAID	United States Agency for International Development
USD	United States Dollar
VAFS	Vietnamese Academy of Forest Sciences
VND	Vietnamese Dong
VNFOREST	Viet Nam Administration of Forestry (in MARD)
VNFF	Viet Nam Forest Protection and Development Fund
WB	The World Bank
WWF	World Wide Fund for Nature
WTA	Willingness to accept
WTP	Willingness to pay



# **1. Introduction**

## 1.1 Problem definition

Ecosystem services (ES) are commonly understood as the benefits human populations derive, directly or indirectly, from ecosystem functions ([Costanza et al. 1997](#); [MEA, 2005](#); [Teeb Foundation, 2010](#)); they have been reframed as nature's contributions to people ([Diaz et al., 2018](#); [IPBES, 2023](#)), with ongoing discussion on how profound this change is ([Kadykalo et al., 2019](#); [Pires et al., 2020](#); [Dean et al., 2021](#)). These services are often classified as supporting (e.g., biomass production, nutrient cycling), provisioning (e.g., food, timber, and fuels), regulating (e.g., climate regulation and water purification) and cultural services (e.g. aesthetic values, sense of place). The provision of these services is based upon the performance of ecological structure, processes and functions. Since ecosystem services play vital roles in human economy and quality of lives, they shape the ways in which we manage environment and development activities on it ([Everard & Waters, 2013](#); [Summers et al., 2018](#)). Ecosystem services are more encompassing than the term 'environmental services' that continues to be used for ecosystem services beyond 'provisioning' ones. The provisioning services is distinguished from other ES because they often take the form of ecosystem 'goods' (e.g., timber, food) for which markets generally exist, rather than 'services' ([Bethwell et al., 2021](#)) for which they often don't ([Leimona, 2011](#)). In recent years, the concept of ecosystem services has been increasingly studied and used in environmental science, policy making and practical applications. The assessment and integration of ES into planning and decision-making processes have been underway in European Union and United States of America (USA) and have also been considered in the global sustainability agenda such as the UN's Sustainable Development Goals ([Geijzendorffer et al., 2017](#); [Bethwell et al., 2021](#)).

ES and the associated values and benefits people derive from these services have been suggested to be degrading at alarming rates ([MEA, 2005](#); [Dobson et al., 2006](#); [Oliver et](#)

al., 2015, Keyes et al., 2021; Verma, 2021). At the same time, the ecosystem services approach has become more attractive to a wide range of stakeholders, and novel incentive-based ecosystem conservation strategies are increasingly used. During the past two decades, “Payments for Ecosystem Services” (PES) have received a great deal of attention as a natural-resource management approach (Landell-Mills & Porras, 2002; Wunder, 2005; Wunder et al., 2015; Wang & Wolf, 2019). Although part of the literature refers to PES as Payments for Ecosystem Services, the provisioning services part is generally understood to already have market-based value expressions, so the focus is on the other service categories.

The concept of PES has been elaborated under the assumption that by measuring the market-conform or equivalent value of ecosystems economically it is possible to create efficient programs that will prevent further loss of ES and induce recovery. Wunder (2005) defined PES as voluntary transactions where a well-defined environmental service<sup>1</sup>( ES) (or a land-use likely to secure that service) is being “bought by a minimum of one ES buyer from a minimum of one ES provider if and only if the ES provider secures ES provision during a determined time (conditionality)”. As such, PES has been seen as a market solution to environmental problems as an alternative to public body and/or community governance. This idea has widely spread, with an estimate of over 500 programmes across the world, although the estimation may vary greatly depending on which PES conceptualisations are included (Salzman et al., 2018).

However, the implementation of the concepts often faces numerous problems: (1) Many, if not most ES are not marketable, as they cannot be split into smaller units that can be separately sold (Fisher et al., 2009; Dunn, 2011; Costanza & Liu, 2014; Bouma &

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<sup>1</sup> As mentioned above, the term Environmental Services refers to Ecosystem Services that do not take the form of “goods” that are readily traded in markets (Bethwell et al., 2021)

Beukering, 2015; Fletcher & Büscher, 2017); (2) as a neoliberal, market based mechanism, it still depends heavily on hierarchical institutions and/or community engagement where it is implemented (Auld et al., 2009; Raes et al., 2016; Martin-Ortega & Waylen, 2018); (3) the pure market transaction barely happened in PES schemes and in many cases users are unaware even of the fact that they pay (Leimona et al., 2018); (4) lack of clarity on rights that regulate who can sell or buy (van Noordwijk & Leimona, 2010), and (5) issues of transaction costs, (lack of) transparency, additionality (or even negative environmental and social outcomes) and conditionality that lead to various concerns of fairness and efficiency by PES buyers, beneficiaries, intermediaries, and supporters (e.g. governments and international donors and agents) in PES framing and implementation (van Noordwijk & Leimona, 2010; Partzsch, 2017; Loft et al., 2017). Pure PES schemes fulfilling all the criteria of Wunder's definition are hardly possible (Martin-Ortega & Waylen, 2018; Shapiro-Garza et al., 2019), or even desirable (Corbera et al., 2007). Indeed, the majority of PES implementations are run by states, non-market, and often in the form of subsidies (Gómez-Baggethun & Muradian, 2015; Vatn, 2015; Fletcher & Büscher, 2017). Some scholars even suggest government's direction intervention into PES to deal with complexity of natural resources management and ensure environmental function (Nagata, 2003; Schomers & Matzdorf, 2013).

More recently, scholars have analysed the institutional nature of PES, underlining the importance of the institutional and social context in which it takes place (Muradian et al., 2010; Sommerville et al., 2009; Martin-Ortega & Waylen, 2018). Herein there is an intensified debate on roles of state/government (regulatory approach) and market (neoliberal approach) in ecosystem services governance. The debate is perhaps best summarised by Wunder (2008) as "*...In principle, a far-sighted and credible state can address both institutional and informational transactional-cost constraints.....*"; but

*"...The real-world problem is that many developing-country nation states are seen as neither environmentally far-sighted nor institutionally credible".* The central question here, is what the preferable option? The plain answer so far may be *"it depends"*. It depends on the socio-economic context and various factors where PES takes place. This thesis aims to inform PES discussions by providing an insight on "what works" and "how" in PES policy development and implementation in Vietnam. The case of Vietnam is strongly relevant as to understand PES development in a "state socialism" country (Vasayakul, 2020) where multiple transitions are happening under strong State' role in controlling the economy and society (Dror, 2019). I apply a grounded approach that aims to understand the dynamics and outcomes of PES interventions at different levels of governance as perceived by relevant actors in the sites of implementation.

### **1.1.1. Payment for forest environmental services in Vietnam – the country's first conservation policy that engages private sector and "market mechanisms"**

The history of providing incentives to rural households for forest protection and plantation in Vietnam traces back to the early 1990s with Programme 327 (1992–1998) and its successor Programme 661 (1998–2010), commonly known as the 5-million-hectare reforestation program. These programmes issued nearly two million forestland contracts to households in the uplands for forest protection and tree planting on designated protection and production forests (Kolinjivadi et al., 2012; To et al., 2012). Just before the end of 661, in 2008, the Government of Vietnam issued Decision No. 380 (2008–2010) that established a national programme for Payments for Forest Environmental Services (PFES). The aims of the PFES programme are to establish a market-based forest protection mechanism through valuation of ecosystem services, alleviate poverty, and secure ecosystem services from forests. These ambitious goals drew hundreds of million dollars from the market to pay forest dwellers for their

conservation efforts<sup>2</sup>. By the end of the pilot implementation of the PFES programme in 2010, the Government issued Decree No. 99/ND/CP/2010 (hereinafter referred to as Decree 99), which outlined a nation-wide implementation. Currently, PFES is being implemented across Vietnam through contracts based on existing forestland titles with millions of dollars in funding from private sources. Decree 99 regulates *ES users* as hydropower enterprises, water supply companies, and eco-tourism businesses, and *ES sellers/suppliers* are legal forest holders who manage the forests, i.e management boards of protected and special-use forests, individuals, forest companies, and local organisations with forest land titles.

PFES policy in Vietnam is a government movement aimed towards reducing state budget's burden of providing financial resources to forestry sector. The policy language used is largely based on the concept of "commoditized ecosystem services" (CES)<sup>3</sup> (van Noordwijk & Leimona, 2010) where a monetary value is assigned for each type of ES used by consumers. Decree 99 employs the term "environmental services" as ecosystem services beyond provisioning, although this difference is not made explicit in the policy document itself. The policy regulates payment for five forest environmental services: (i) watershed protection; (ii) drinking water supply; (iii) landscape beauty and biodiversity for tourism; (iv) forest carbon sequestration and retention, and (v) provision of spawning grounds for aquaculture (Table 1.1). It was said to be the first national policy to define 'environmental service providers' and those who benefit from forest-based ecosystem services – the 'service users' (To et al., 2012; Pham et al., 2021). The policy,

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<sup>2</sup> Vietnam Forestry Development Strategy 2006–2020

<sup>3</sup> It should be noted, how

ever, that the implementation arrangement of PFES is similar to COS (Compensation for Opportunities Skipped) as farmers are paid for their forest patrol efforts as daily wage.



however, also received numerous criticisms for creating a compulsory payment obligation to the private sector, among others (Pham et al., 2013, McElwee et al., 2020).

**Table 1. 1 Environmental services regulated by Decree 99 in Vietnam**

Forest environmental services	ES beneficiaries/users (buyers)	ES providers (sellers)	Payment rate <sup>4</sup>
Hydrological services (watershed protection and quantity, regularity and quality of water supply)	<ul style="list-style-type: none"> <li>Water utilities</li> <li>Hydropower producers</li> </ul>	<ul style="list-style-type: none"> <li>Forestland holders and forest protection sub-contractors</li> </ul>	<ul style="list-style-type: none"> <li>20 VND/kWh of commercial electricity output</li> <li>40 VND/m<sup>3</sup> of clean water output</li> </ul>
Scenic/landscape beauty and biodiversity for tourism	<ul style="list-style-type: none"> <li>Enterprises providing eco-tourism and nature-based tourism - related services</li> </ul>	<ul style="list-style-type: none"> <li>Forestland holders and forest protection subcontractors</li> </ul>	<ul style="list-style-type: none"> <li>1–2% of revenue from eco-tourism</li> </ul>
Biodiversity support (provision of spawning grounds for aquaculture)	<ul style="list-style-type: none"> <li>Aquaculture enterprises and households</li> </ul>	<ul style="list-style-type: none"> <li>Mangrove-forestland holders and forest protection subcontractors</li> </ul>	<ul style="list-style-type: none"> <li>Not yet defined</li> </ul>
Climate regulation services (carbon sequestration and retention)	<ul style="list-style-type: none"> <li>Liabile greenhouse gas (GHG) emitters</li> </ul>	<ul style="list-style-type: none"> <li>Not yet defined, likely forestland holders and subcontractors eligible for carbon service payments</li> </ul>	<ul style="list-style-type: none"> <li>Not yet defined</li> </ul>

Vietnam is also a part of REDD+ initiatives, under the United Nations Collaborative Programme on REDD (UN-REDD) and the World Bank's Forest Carbon Partnership

<sup>4</sup> These rates of payment are regulated in Decree 99/2010/ND-CP of the Government issued in 2010. By the end of 2018, the Government issued Decree 156/2018//ND-CP that regulate payment rates as VND 36 per KWh of electricity and VND 52 per cubic metre of produced clean water.

Facility (FCPF) since 2008. The state intended to use PFES institutional structure (Traedel et al., 2016), especially the benefit distribution system for a fast-track REDD+ development. In 2012, it announced an ambitious National REDD+ Action Programme (National REDD Strategy in many international documents) that orders development and implementation of provincial REDD+ action plans. However, as REDD+ is under development and pilot activities are only in an early stage, provinces are struggling with setting up REDD+ targets and more importantly, mainstreaming such targets into their own socio-economic development plans, particularly land use and forestry plans (Hoang et al., 2013). This is a challenging assignment considering a long history of traditional top-down planning in land use and forestry sectors (Castella et al. 2005, Lambin and Meyfroidt 2010; Loft et al., 2017; McElwee et al., 2020) and the implementation of poorly designed incentive mechanisms in afforestation, reforestation and protection that often left out poorest groups in the country (Clement & Amezaga, 2009, De Jong et al., 2006).

With the above developments, Vietnam claims it is the first Asian country to implement nation-wide PES (To et al., 2019; Pham et al., 2021; Dinh, 2022) and amongst the most advanced REDD+ countries – portraying a government that has been very successful in adopting internationally developed market-based mechanisms for conservation objectives. However, with a “national approach” dominated by central government to both initiatives, there is little evidence of how sub-national (and even national actors) and governance structures adopt these mechanisms, how these change their “business as usual”, and how they contribute to reshape and re-enact PES concepts and practices in implementing PFES policy. These aspects make Vietnam an interesting case to see how “theoretical” neoliberal conservation using PES operate in a country with a long history of socialism and command-and-control state forest governance.

### 1.1.2 Gaps in the literature and potential contributions of the thesis

In the last two decades, PES has received increasing attention among scientists and practitioners. The historical development of the ES concept and its incorporation into markets and payment schemes was depicted by [Gomez-Baggethun et al. \(2010\)](#). [Jack et al. \(2008\)](#) summarise literature on how the environmental socio-economic and political context influences the outcomes of PES schemes. It was found that government payment is the most dominant approach ([Schomers & Matzdorf, 2013](#)) in either industrialised or developing countries. It was also found that market-based mechanisms and private governance neither strengthen “weak states” nor complement governments where they lack policy options) ([Cashore & Nathan, 2020](#)). In countries with strong state’s role like China, the combined contributions of central government and local governments are a popular way of payments for ecological benefits of non-commercial forest and watershed conservation, and involvement of business is not significant ([Pan et al., 2017](#)). These schemes are often referred to as “PES-like” or “labeled as PES” ([Schomers & Matzdorf, 2013](#)). However, instances where such “PES-like” schemes mobilise significant resources from private sector are sparsely reported in the literature, if at all.

The literature on PES in Vietnam has increased significantly since the pilot and implementation on PFES policy. So far there are two main bodies of PFES literature: one focuses its performance, whether it is environmental ([Dang Do & NaRanong, 2019](#); [Duong & De Groot, 2020](#); [Paudyal et al., 2020](#)), economic ([Pham et al., 2021](#); [Dinh, 2022](#)), or social ([To et al., 2012](#), [Haas et al., 2019](#), [Pham & Roongtawanreongsri, 2022](#)) – this body of literature often links PFES performance and effectiveness with either benefit distribution systems or (the lack of) monitoring, reporting and verification system; the other one is interested in the institutional, organisational and operational structure of

PFES that mainly raises concerns surrounding “fairness arguments”: transparency, equity, and participation (Pham et al., 2015; Le et al., 2016; Yang et al., 2016; Hass et al., 2019; Lan et al., 2020; Ngoc et al., 2021). A smaller proportion of the literature describes PFES more comprehensively as a policy practice by analysing the policy documents, case studies, and pre-existing literature (Pham et al., 2013) but often with subjective lens of the authors and lack of multi-dimension lens of the complex situation through which PES can be understood (Van Hecken et al., 2018). In addition, I also observe some policy-oriented scientific synthesis which aims to explain and evaluate PFES outcomes in order consolidate the legitimacy of the policy (Pham et al., 2018b; Nguyen et al., 2020).

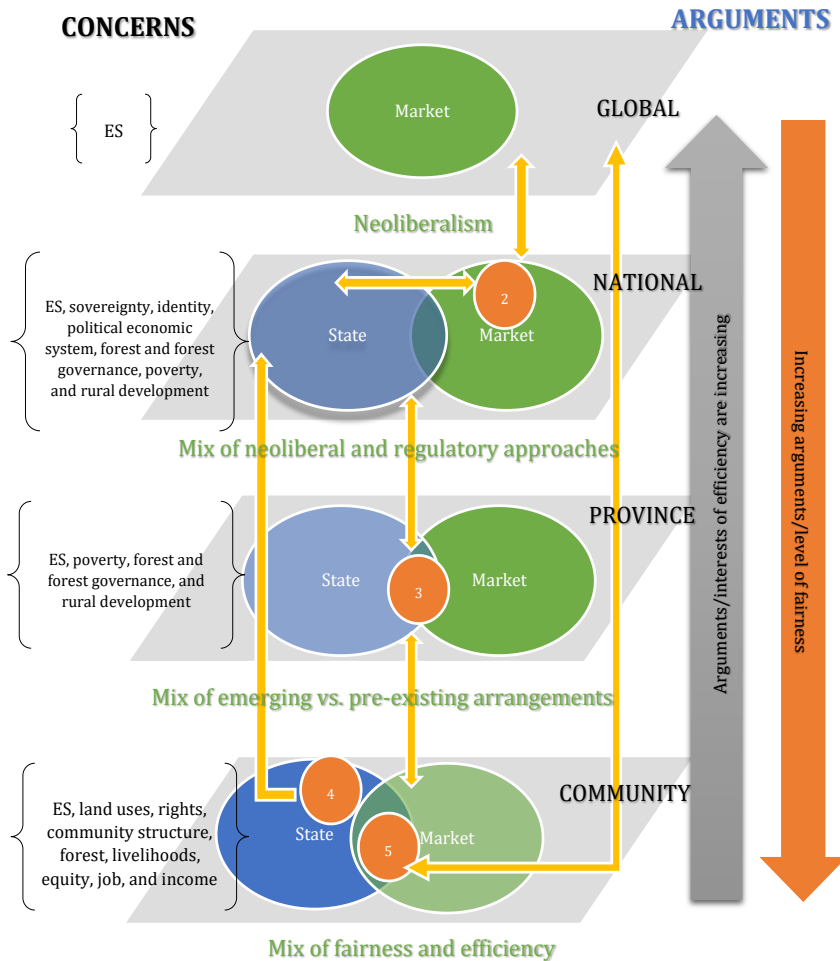
This research contributes to PFES knowledge and practices in several ways. First, I offer a multiple scale analysis from national level to community level that informs the effectiveness of ES governance systems, especially those considering the spatial scale implications of landscape management (Metzge et al. 2020). Second, I apply a discursive institutional approach that allows us to understand perceptions of PFES actors in the context of institutional challenges that tend to favour rigorous ecosystem services policies which often separates those actors from ecosystem service beneficiaries (Bork & Hirokawa, 2021). This issue is important because the way actors/stakeholders understand and engage with the concept will have important implications for their practices, and importantly, expectations for what can be achieved (Martin-Ortega & Waylen, 2019; Kuswandro et al., 2020). Herein, special emphasis is put on the structural conditions that lead to the lack of well-functioning markets, to trade-offs between equity and efficiency, and to the importance of social embeddedness in the design and implementation of PES schemes. Thirdly, I collect perceptions of PFES by stakeholders taking into account contextual histories, practices and scales where PES is operating, thus provide a more comprehensive view of the subject. I acknowledge that

scientists such as [Kolinjivadi et al. \(2012\)](#), [Suhardiman et al. \(2013\)](#), [Trædal et al. \(2017\)](#), [To et al. \(2019\)](#), and [McElwee et al. \(2020\)](#) have examined PES development under existing forest management regime and historical forest institutions in Vietnam. However, their analyses are mostly based on existing secondary data and policy documents, and thus provide reflections based on existing scientific literature. Our fourth important contribution is that our analysis provides empirical evidence of PES perceptions and constructions in Vietnam using a participatory approach and direct elicitation research methods such as Q-methodology. I expect that the findings can be, to some extent, generalizable and more broadly applicable to PES policy design and implementation in regions and countries with similar context.

## 1.2 Conceptual framework and research questions

The conceptual framework of the research is provided in [Figure 1.1](#) below. The entry point for my argument is that PES is rooted in neoliberal logic ([Wunder, 2005](#); [Büscher, 2012](#); [Fletcher & Büscher, 2017](#); [Martin-Ortega & Waylen, 2018](#); [Kaiser et al., 2021](#)), that is power of economic incentives (through market-based mechanisms) to alter behaviour in ways that enhance the efficiency or cost-effectiveness of ecosystem service provision while reducing state's influence in resources governance. As such it would ride on or require market mechanisms for environmental governance. Augmentation of market-oriented values and logic into pre-existing institutional settings therefore needs to be tested rather than taken as ideological claims ([Gómez-Baggethun & Muradian, 2015](#)). The framing of PES, however, overlooks the importance of the institutional and social context in which it takes place ([Muradian et al., 2010](#)). In global South, neoliberal governmentality (based on the predominance of market mechanisms) often requires auto-regulation that hardly exists, and PES has to, more or less, rely on hierarchical institutions of local state. It should be noted that new ideas or concepts are not translated

into actions by default, but through dynamics of (powerful) political interests and established changes in policy and institutional arrangements ([Hysing, 2021](#)). There is an important need to understand PES schemes are practiced when there is interaction of market governance (neoliberal market based approaches) with state governance (regulatory and policy), how these dynamics are perceived and translated by stakeholders across scales of governance (national, sub-national, grass-root), and how these policies are being shaped by PES actors to make them more favourable to social, cultural or economic priorities in local areas. There is also a need to distinguish governance structures that connect to arguments and logics of particular policy and strategies ([Loft et al., 2015](#)).



**Figure 1. 1** The conceptual framework underlying this study of PFES in Vietnam (Note: the numbers indicate chapters of this thesis)

This research is a multi-scale analysis and by “scale” I do not necessarily refer to a certain biophysical entity as in ecological sciences but rather a social construct as in environmental sciences (Buizer et al., 2011). I acknowledge that ‘human’ scales of landscape governance do not necessarily align with the ‘natural’ scales of ecosystem services. However, I would like to analyse decision making that links to policy design and implementation under a hierarchical governance and that makes incorporating

ecological scale yet possible. More specifically, I explore PES policy development and operation at “governance scale” including international, national, provincial, and community levels – that create a hierarchical structure. These scales are identical to jurisdictional scale and closely related to institutional arrangements, levels of governments as well as hierarchy of rules (Cash et al., 2006; Termeer & Dewulf, 2014). Conventionally, there are relatively clear divisions of tasks and responsibilities between government levels (Daniels, 2022): central government is responsible for developing policies and strategies, sub-national governments are implementing such policies within their jurisdiction. At grassroot levels, there is often certain flexibility that local government can utilise to make policy implementation fit to local socio-ecological conditions.

Often, PES schemes are included in forest/landscape governance, and thus they can (and even should) contribute to multiple objectives beyond securing the ES of interests (Landell-Mills & Porras, 2002, Muradian et al., 2010; Balderas Torres et al., 2013). At national level, these multiple objectives and concerns can be national sovereignty and identity, the political-economic system where PES is constructed and operated as an “instrument” to protect forests and contribute to poverty alleviation (Van Hecken et al., 2019), enhancing forest governance system, and fortify rural development agenda (Muradian et al., 2010). Governments in global South often aim to reach similar level of income and development of developed countries while also take considerable efforts in addressing social expectations regarding environmental policies (Loft et al., 2015). At this level, policy failure may happen without considering the socio-political context in institutional design and implementation. In Vietnam, the government established a national level “PES like” scheme and participate actively in REDD+ to (financially and technically) enhance the pre-existing forest governance system and depict a strong



Vietnam's commitments in forest protection – but the ES targets and the level to which “market elements” are rationalised remain very ambiguous (Pham et al., 2013; Schomers & Matzdorf, 2013; McElwee et al., 2020). At community (grassroot) level, more attention is paid on issues of land uses, rights, livelihood, equity, and pre-existing community structures (Muradian et al., 2010; Hejnowicz et al., 2014; Rasch et al., 2021). Rural landowner participation in incentive programs is influenced by different factors including the characteristics of the schemes, the characteristics and attitudes of the individuals and the activities developed on the land (Ma et al., 2012; Frondel et al., 2012; Balderas Torres et al., 2013). The dynamics refers to how local communities and authorities harness these “new neoliberal” arguments (or their counter arguments) for their needs. A voluntary, pro-poor PES scheme based on collective actions is often desirable but maybe less feasible depending on national policy context and level of flexibility of PES scheme designs. At the subnational level (meso-scale between national and grassroot level) such as the provincial level in the case of Vietnam, the main concern is how to translate and implement national policies by the existing governance structure (with little modifications), demonstrating “success” in forest protection, poverty reduction, and rural development. This mesoscale and community scale are important in PES studies because at this scale management and governance interventions of ecosystem service supply are possible (Metzge et al. 2020). Overall, PES can be seen as a social construct, reflecting a certain distribution of power and different objectives and interests among stakeholders (Corbera et al., 2007; Pascual et al., 2010).

Discussions on PES practices across scales in Asia have resulted in “fairness vs efficiency” arguments (van Noordwijk et al., 2012; Leimona et al., 2015; Chu et al., 2018). The neoliberal PES itself can be seen to focus on efficient distribution of resources (Wunder, 2005; Kolinjivadi et al., 2019) but numerous scholars find the need for PES to

find equitable solutions to environmental problems (Martin-Ortega et al., 2019). Accordingly, PES can enhance local environmental services which are enjoyed locally by the providers (Balderas Torres et al., 2013). However, interests (and disinterests) on fairness and efficiency seem vary greatly across governance scale. At higher level, efficiency is the typical language such as “payment”, “transaction cost”, “additionality”, and “conditionality”, “performance-based” wherein at lower levels fairness language becomes more dominant, e.g., “equity”, “sharing”, “rights to access”, “rights to land”, “stewardship” (Arts et al., 2019; Leimona, 2020). Depending on the level of “fairness” and “efficiency” elements, PES paradigms can be conceptualised as commodification, compensation or co-investment (van Noordwijk & Leimona, 2010).

PES (Wunder, 2005) refers to a neoliberal concept which is translated into environmental/conservation policy of many countries. As such there are many institution- and power-related questions to be answered: what ES to be paid, who will receive payment, who will have to pay, how payment structure is organised, how trade-offs between options are considered, how to avoid potential conflicts between social actors, etc. These require an institutional and policy lens in analysis. In this research I apply perspectives of discursive-institutional analysis (DIA) (Schmidt, 2008; Arts & Buizer, 2009) as the main analytical approach. The DIA approach focuses on how ideas, discourses, concepts and narratives develop in specific contexts, how these are delivered to and exchanged between actors (Arts & Buizer, 2009; Kuswandro et al., 2020), how ideas/concepts are institutionalised in rules and norms, and how such institutionalisation affects institutional dynamics or causes institutional changes. This approach has been empirically practiced by a number of scholars including Arts & Buizer (2009), Ochieng et al. (2016), Kuswandro et al. (2020), and Kaufmann & Wiering (2021) in understanding the development of and power relations in public policies,

including forest policies. It focuses on both policy and governance and takes into account the effect of external factors on policy arrangements. I use DIA to explore PES/PFES discourses and how their actors perceive problems, goals and solutions relating to those discourses, the rules of PES (regulations of the policy, informal rules, policy making process and division of responsibilities), and the way actors mobilise and utilise resources for their purposes. These dimensions are analysed in a flexible approach: each empirical chapter may not focus on all dimensions as some of them are overlapping throughout. Overall, the approach allows me to bring together insights from neo-institutionalism and discourse theory to explore how PES has been translated and reshaped in PES policy making and implementation, and the ways PES actors interact, exercise and expand their power (if any) to achieve their multiple goals in the forest governance system. The analysis is made relevant to rural histories and forest institutions in Vietnam to understand the way PES takes shape and performs, and the implication of these developments to forest governance policies in the country. The approach is specified further through my research questions below.

### **Research question 1 – To what extent does the neoliberal PES logic work in Vietnam?**

PES is based on the “beneficiaries pay” rather than polluters pay principle. PES market is therefore developed for “transaction” of rights to consume ecosystem services, e.g. to enjoy clean air, watershed protection, or water infiltration, etc. If the market logic works for neoliberal PES, there should exist “market rationality” ground for the business case. In the case of Vietnam, the state-run PES scheme has been criticised for not being based on voluntary negotiations (Hoang et al., 2008; Hoang & Do, 2011; Kolinjivadi & Sunderland, 2012), but rather, ES buyers are ‘forced’ to pay without understanding how much ES are needed for their business operation, and how to measure ES delivery. The

existence of business case for PES or PES market rationality as perceived by business sector remains questionable. To answer this question, I seek to understand how PFES is being perceived by ES buyers, the “new” stakeholder group in ES and forest conservation, and I also seek to understand state’s role in PFES in Vietnam with links to history of state’s roles and involvement in forest conservation. For this purpose, a survey of buyers’ motivation to pay for ES and a PFES policy and market analysis are employed. This study is conducted at national level where the PFES policy is developed and applied throughout.

### **Research question 2 – – What discourses either underpin or undermine the Vietnamese government-led PFES approach at national and local scales?**

In Vietnam, the government and other stakeholders adopted a PFES that largely relies on pre-existing forest governance structure. Herein the “new”, “market-based” mechanism is blended with the hierarchical, regulatory governance framework. It is interesting to know how PFES is actually perceived --- a new and relatively independent mechanism or reframing i.e. “old wine in a new bottle”. I explore the discourses that underpin PFES debates and practice in Son La province, one of the first provinces to implement PFES in Vietnam. The study is informed by interviews with PFES actors and the use of Q-methodology to capture key PFES discourses in the province.

### **Research question 3 – To what extent may local communities advance the PES discourses towards a fairer scheme that better addresses their needs?**

Even if non-neoliberal parts of PFES may be structurally and intentionally designed ([Suhardiman et al., 2013](#); [McElwee et al. 2020](#)) to fit Vietnam’s socio-political context, the question is if PFES can be improved towards a fairer, market-oriented scheme without being completely neoliberal ([Kaczan et al., 2013](#)), and if pre-existing local governance structure can also be improved for ES targets. I conduct two case studies to

generate empirical evidence of (1) how ES providers and users can negotiate for a voluntary, performance-based PES transaction, and (2) how local communities jointly develop land use plan that mainstreams ES perspectives and inform national level policies and targets on ES.

### 1.3 Methodological approach

While the overall analytical framework of the research is DIA as mentioned above, I use multiple methods and analytical frameworks for different “case studies” which are presented as chapters in this thesis. Using a “mixed-methods” approach lends itself to my research’s aims and questions, and comprehensiveness is the main driver for the range of methods used. My research object is PES that includes ecosystem services (thus quantitative methods to measure and map their stocks and flows, and qualitative methods to understand stakeholders’ perceptions on ES), economic transactions between actors (thus economic valuation and the economics/market rationality in decision-making in certain contexts, and role of intermediary in the transaction), and the subjectivity/opinions of actors engaged in the process (thus a number of stakeholders’ perception elicitation techniques, discourses analysis and Q methodology). In addition, there is a need to understand to governance of forest and PES (thus to understand and analyse governance modalities and the interactions among PES and other policies and stakeholders under certain socio-economic-cultural contexts). It is obvious that there are a wider range of questions than any single method would allow. The use of mixed methods would also enable us to integrate many perspectives over the research subject without being tied to certain established research paradigms. More details on my methodological approach are provided in Table 1.2 and following paragraphs.

**Table 1.2** Methodological approach

	<b>Research question 1</b> To what extent does the neoliberal PES logic work in Vietnam?	<b>Research question 2</b> What discourses either underpin or undermine the Vietnamese government-led PFES approach at national and local scales?	<b>Research question 3</b> To what extent may local communities advance the PES discourses towards a fairer scheme that better addresses their needs?
Analytical framework	Characteristics of Ecosystem Services and market rationing (Farley & Costanza, 2010; and Kolinjivadi et al., 2014)	Inductive discourse analysis	The three PES paradigms based on fairness and efficiency: Payments, Compensation, and Co-Investment (van Noordwijk & Leimona, 2010)
Methods	Structured questionnaire survey and in-depth key informant interview	Q-methodology	Participatory Land Use Planning for Multiple Ecosystem Services (LUMENS) framework (Dewi et al., 2015) Contingent Valuation and Discrete Choice Experiment for assessment of willingness to pay and willingness to accept PES contracts
Administration level	Nation (Vietnam)	Province (Son La province)	Commune (Na Nhan commune - Dien Bien province, and 8 communes in Quang Nam Province and Da Nang city)
Geographical scale	Macro	Meso	Micro

For research question 1, I perform a critical analysis of the motivation of ecosystem services buyers in Vietnam (national wide study). I employ an institutional framework to analyse ES characteristics (Kolinjivadi et al., 2014) in relation to their marketability (hence, the possibility of a “market-based” PES in the country). I also discuss the state’s role in PFES the way the state shaped a “blanket” national PES programme as part of its forest and ES governance. The methods were structured questionnaire survey and in-depth key informant interview. For research question 2, I perform an inductive discourse analysis employing the Q-methodology (Stepheson, 1935; Brown, 1993) to analyse stakeholders’ perspectives on PFES in Son La province and to answer the following sub-questions: has PFES been seen as a neoliberal, market-based instrument?; how PFES is blended with pre-existing policies?; how “policy mixes” have been applied, how “non-state” stakeholders have been involved; and what are the nature of “participation”.

For research question 3, I conduct two case studies at community level: one in Na Nhan commune, Dien Bien province (Northwest Vietnam), and the other one in Quang Nam province and Da Nang city (Central Vietnam). In the first case study I apply Participatory Land Use Planning for Multiple Ecosystem Services (LUMENS) (Dewi et al., 2015) framework to understand how a rural landscape can prepare its own land use plan to address socio-economic and environmental needs, including climate change mitigation, and how this process can help to inform policy making and implementation of national programs and strategies on ecosystem services such as the NDC. The study was undertaken at commune level, the lowest jurisdictional tier of the administration system in Vietnam where socio-economic and environmental plans and decision can be made. Some specific methods used for this study were land use change mapping, estimate of changes in biomass carbon stock, questionnaire survey and focused group discussion. In

the second case study I assess both PES users' willingness to pay and suppliers' willingness to accept PES contracts using contingent valuation and discrete choice experiment methods. These two methods allow us to examine how the two criteria of PES (Wunder, 2015) – voluntariness and conditionality are perceived by stakeholders and to what extent they will influence PES design and implementation.

## 1.4 Structure of the thesis

This thesis is organised in six chapters. Chapters 1 and 6 are Introduction and Synthesis, respectively. The four empirical studies are presented in Chapters 2-5: three of these have been published as journal articles in 2018, 2020, and 2022, and one is to be submitted to a journal (2023).

**Chapter 1** (*Introduction*) provides background of the thesis, problems definition, research questions and methodological approach. **Chapter 2** (*How does market logic work in payment for forest environmental services in Vietnam?*) addresses the first research question by analysing buyers' motivation in PFES payment in Vietnam to see if the market logic works for PFES and what is the current role that the Government of Vietnam is playing in the process. **Chapter 3** (*Payment for forest environmental services in Vietnam and views on its success: a Q methodology study*) offer a Q methodology study to understand provincial stakeholders' perspectives on PFES. **Chapter 4** (*Enhancing community engagement in governing landscape and ecosystem services: a participatory land-use scenario development*) deals with research question 3 by analysing the way stakeholders engage in participatory land use planning process to demonstrate their contributions to national ES targets (greenhouse gas emissions and carbon sequestration). The study was undertaken at commune level, the lowest jurisdictional tier of the administration system in Vietnam, where socio-economic and environmental plans and decisions are made. **Chapter 5** (*Voluntariness and conditionality*



*considerations in developing pro-poor PES at community level in Vietnam*) deals with the third research question and partly with the first research question at community level. By analysing the willingness to accept and willingness to pay for a hypothetical PES contract, I identify constraints to “market-based” PES according to local communities’ perspectives and propose solutions to promote voluntary PES. **Chapter 6** (*Synthesis*) combines findings of Chapters 2-5 and provides reflections on research questions as well as methodological approach in understanding PFES policy making and implementation. It also offers a number of policy recommendations and ideas to continue study PFES, especially in the aspect of relational values that is mostly not covered by this thesis.



## 2. How does market logic work in payment for forest environmental services in Vietnam?

Do Trong Hoan, Vu Tan Phuong, Nguyen Van Truong, and Delia Catacutan

The contents of this chapter have been published in *Ecosystem Services*:

Do, T. H., Vu, T. P., Nguyen, V. T., & Catacutan, D. (2018). Payment for forest environmental services in Vietnam: An analysis of buyers' perspectives and willingness. *Ecosystem Services*, 32, 134–143. doi:10.1016/j.ecoser.2018.07.005

## Abstract

To mobilise more resources for conservation, the government of Vietnam has implemented a Payment for Forest Environment Services (PFES) policy that creates a market by collecting payments from a rather limited set of ecosystem services (ES) buyers and setting up a forest protection and development fund. Herein ES buyers do not interact with ES providers, and their participation is primarily based on regulatory compliance. We therefore asked, ‘what could be the real motivation for private-sector buyers of ES in Vietnam?’ We found that, although private-sector voluntary engagement is currently lacking, it is interested and willing to pay for ES. However, in their perspective, the ES that are regulated by the PFES policy had very weak elements of private goods and are thus difficult to be rationed. On the governance side, although the government has created a PFES structure, it neither facilitates direct engagement between ES buyers and providers, nor does it create an enabling environment for the emergence of voluntary payment schemes. To sustain the PFES, we suggest that along with amending laws and regulatory procedures to make ES more marketable, the government should evolve from regulating to enabling PFES negotiations using existing structures.

## 2.1 Introduction

Payment for ecosystem services (PES) is not a new concept as it has been practiced in different forms since the 1880s (Hellen, 2011). Over time, the concept and development of PES have become relatively diverse, and they are increasingly recognized as an effective mechanism that addresses market failure by altering the economic incentives of land managers or owners (Landell-Mills & Porras, 2002; Hellen, 2011; Farley & Costanza, 2010). At a higher policy level, the debate around PES revolves around whether PES is or should be a neoliberal environmental policy. According to neoliberal economics, market-based management will be more efficient in allocating resources for conservation than the conventional 'command-and-control' approach in developing countries (Wunder, 2005). On this premise, ecosystem services (ES) are marketable and the PES should be like any other market transaction. On the other hand, a number of scholars argue that since ES often lack the features of tradable goods such as excludability and rivalry, the PES market would not work (Landell-Mills & Porras, 2002). Critics also point to the fact that each single ecosystem service narrows down ecosystem complexity and does not embrace ecological, social, or spiritual values as separate from an income dimension (Kolinjivadi et al., 2014). Accordingly, there is a need of a special arrangement other than market mechanism for dealing with the environmental function and long-term elements of resource management, that is: government intervention or direct government administration (Nagata, 2003). Along this line, it was suggested that PES, at least in developing countries, should be considered explicitly as part of a portfolio of rural development programmes and projects, instead of an economic tool only used to guarantee environmental protection in the most efficient way (Muradian et al., 2010). In reality, neither the market nor the government is perfect and ideal. The right balance

between these two, that is theoretically the peak condition for PES to develop, is context-dependent.

After a rapid forest loss in the past, Vietnam has shifted its focus from exploitation to conservation and development of forest since early 1990s. Since 2008, the government of Vietnam has piloted market-oriented approaches to forest management, and since 2010 a national policy on payment for forest ecosystem services has been implemented and considered to be a potentially very successful regime for sustainable forest management (Pham et al., 2013). However, there is criticism that this state-run PES scheme is not based on voluntary negotiations (Hoang et al., 2008; Hoang & Do, 2011; Kolinjivadi & Sunderland, 2012), but rather, ES buyers are ‘forced’ to pay without understanding how much ES are needed for their business operation, and how to measure ES delivery. Consequently, there are concerns that the government cannot attract continuous private-sector funding for PFES, making the program’s future uncertain. This paper offers a critical analysis of the motivation of ES buyers in Vietnam. It highlights the factors that undermine their willingness to pay, and the roles the government should be playing in the future, to further engage the private sector in the PES program.

### **2.1.1 The market rationale of payment for forest ecosystem services**

Forests contribute multiple of crucial ecosystem services to human society (De Groot et al., 2002; Gamfeldt et al., 2013, Guerra-De la Cruz & Galicia, 2017). From economists’ point of view, forest degradation and forest loss have been threatening forests worldwide because incentives for forest conservation have been either weak or lacking. Within the free market mechanism, forest conservation is economically less attractive than forest exploitation (Pearce, 2001), and this will potentially misinform decision

making relating to ecosystems (MEA, 2005). Therefore, to encourage positive human behaviour towards forests, the value of non-marketed benefits provided by forests (i.e. forest ecosystem services) must be identified and accounted for in forest management policy. These economic values could then be “traded” in a market mechanism, the ecosystem services market and PES. Economic valuation of ecosystem services hence has been placed at the core of PES. However, the complicated nature of ecosystem functions and the fact that benefits from ecosystems are interpreted differently at multiple scales and by various groups of stakeholders have challenged researchers in obtaining credible, operational valuations of ecosystem services (Costanza 1997; De Groot et al., 2010 and 2012; Ninan & Inoue, 2013). Consequently, decision makers, especially those in developing countries hardly mainstream forest ecosystem service values into forest governance and environmental management. Ecosystem services valuations have not contributed on ecosystem management, including PES, as significant as expected (Liu et al., 2010).

Worse for PES policy development and operation is that even if an ecosystem service is clearly defined and valued, it may still not be marketable. Market failures are often discussed in the debates about the public good characteristics of ecosystem services that are non-rival (the consumption/use of the good or service by one person does not reduce the availability or utility of the good or service to another person) and non-excludable (any good or service that someone cannot be prevented from accessing because of non-payment) (Dunn, 2011). In contrast, private goods are both rival and excludable. Ecosystem services are, in most cases, neither of the two but somewhere between (Bouma & Beukering, 2015; Fisher et al., 2009). A number of scholars labelled ES, particularly regional ones attributable to land-use behaviour such as watershed services, as club goods or toll goods that are non-rival but excludable (Costanza & Liu, 2014; Engel

et al., 2008; Farley & Costanza, 2010; Kolinjivadi et al., 2014; Villamor et al., 2007). For example, landscape beauty service (within National Park boundaries) is a club-good because it is non-rival (i.e., there is no limit of how many people can enjoy it) but highly excludable, because principally one can only benefit from the service until he/she pays the park entrance fee. Other authors including Bouma & Beukering (2015) classified ES as common-pool goods that are rival but non-excludable. A typical example of common-pool good is a public pool where every people can come fishing. It is a rival resource (because the number of fish in the pool is limited) but non-excludable (because no rules and laws exclude anyone from fishing in the pool). This is how the 'tragedy of the commons' started (Hardin, 1968). Scholars often use the tragedy of the commons to refer to 'limited but open-access' resources or goods that everyone can exploit for free, and thus would quickly deplete due to overuse. However, it should be acknowledged that not all ecosystem services have the same excludability and rivalry characteristics, and that these economic characteristics of goods are context-dependent (Frischmann, 2012; Vries, 2013). It has been agreed that services dominated by private-good characteristics are amenable to voluntary payments, while services with public-good characteristics are not (Costanza & Liu, 2014; Farley & Costanza, 2010; Kemkes et al., 2010).

### **2.1.2 The government's multiple roles in PES**

In allocating benefits from ecosystem services, a market-based PES works better than a government command-and-control approach, provided that the right background conditions, such as appropriate institutional and legal frameworks and sufficiently low transactions costs are in place (Scherr et al., 2004). In developing countries, where institutional capacity is generally weak, the government stake in PES is not un-avoidable, but rather desirable. Scherr & Bennett (2011) discussed government roles in PES and assumed that they are evolving in three distinct ways: buyer, regulator, and enabler.



Table 2.1 summarises the different roles and tasks of governments in PES schemes with some examples around the world.

**Table 2.1 Role of Government in PES and PES like programmes**

Role	Tasks	Examples
Buyer	Direct buyer of ecosystem services in the interest of the public	China's National Forest Conservation Program: partial funding responsibilities attached to local government; China's Green and Grain Programme (Zhiyong, 2003)  5 million ha reforestation programme (commonly known as 661 Program) <sup>5</sup> in Vietnam, where Government applied fixed rate payment to forest owners for planting and protecting forests
Regulator	Mobilizing private demand for ecosystem services through environmental compliance rules or setting up cap-and-trade systems.	PFES of Vietnam. By Decree 99, the Government requires hydropower producers, water supply companies and eco-tourism enterprises to make fixed rate payments to forest land owners where the ES are "assumed" to be generated
Enabler	Assisting private actors to buy and sell ecosystem services and providing new legal and policy frameworks to expressly encourage and facilitate market development	Biodiversity Trust Fund (privately operated) in Costa Rica <sup>6</sup> , which can directly collect funding from conservation activities. (Porrás et al., 2013)

### 2.1.3. Government-led PES in Vietnam

In Vietnam, the PES concept has been widely implemented in the forestry sector. The history of providing incentives to rural households for forest protection and plantations in Vietnam traces back to the early 1990s with Programme 327 (1992–1998) and its successor Programme 661 (1998–2010). It is commonly known as the 5-million-hectare

<sup>5</sup>The 661 Program was initiated before the term 'payments for ecosystem services' became popular in international debates, yet it was based on the same principle of PFES in Vietnam today.

<sup>6</sup>PES policy in Costa Rica (introduced by the Forestry Law 7575 in 1996): although the government is still the biggest ES purchaser (others hail from the private sector, international banks, and bilateral agencies), it creates flexible platforms for voluntary PES where the private sector can actively engage, e.g. through certification programmes.

reforestation programme and now a forest protection and development plan (2011–2020). These incentive-based programmes issued nearly two million forestland contracts to households, intended to protect forests and plant trees on designated protection and production forest areas ([Kolinjivadi & Sunderland, 2012](#); [To et al., 2012](#)). In 2008, the government issued Decision No. 380 (2008–2010) to pilot a national programme of Payments for Forest Environmental Services (PFES). The rationale behind the PFES policy was that the forestry sector has been adversely affected by previous policies that failed to take account and value the full range of services and activities generated by forests, and that the link between forests and other economic activities should be considered through a more holistic approach. The aims of PFES were thus to establish a market-based forest protection mechanism through the valuation of ecosystem services, for poverty alleviation and secured forest ecosystem services. The ambitious goal was to draw two billion USD from ES market to pay forest dwellers for their conservation efforts by 2020 (Vietnam Forestry Development Strategy 2006–2020<sup>7</sup>).

By the end of the pilot implementation in 2010, the government issued Decree No. 99, which defined the national PFES programme. The Decree regulates five environmental services (can be referred to as ecosystem services as identified by [MEA \(2005\)](#)): i) soil protection, reduction of erosion, and sedimentation of reservoirs, rivers, and streams; ii) regulation and maintenance of water sources for production and domestic use; iii) forest carbon sequestration and retention, reduction of emissions of greenhouse gases through measures for preventing forest degradation and loss of forest area, and for sustainable forest development; iv) protection of natural landscapes and conservation of biodiversity of forest ecosystems for tourism services; and v) provision of spawning

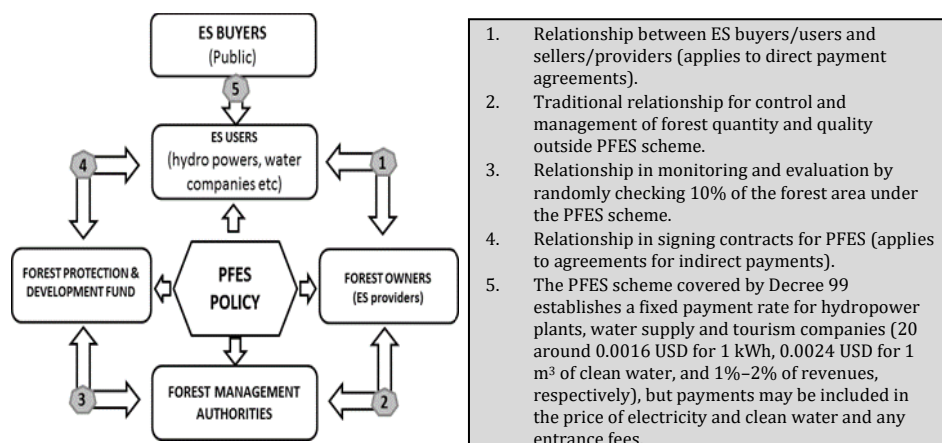
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<sup>7</sup> Decision No. 18/QĐ-TTg of the Prime Minister dated 5 February 2007.

grounds, feeding sources, and natural seeds, and the use of water from forests for aquaculture. To date, more than 20 PES projects are being implemented across Vietnam through contracts based on existing forestland titles in the uplands, with committed funding in millions of dollars from both the public and private sectors (To et al., 2012).

In establishing a base payment for the five environmental services mentioned above, Decree 99 identified the ES buyers/users and sellers/providers. Buyers/users are hydropower enterprises, water supply companies, and eco-tourism businesses, while ES sellers/suppliers are forest owners who manage the forests, the management boards of protected and special-use forests, individuals, forest companies, and local organisations who hold forest land titles. A fixed rate of payment has been applied. Hydropower enterprises pay 36 VND (about 0.0016 USD) per KWh for commercially-produced power, water supply companies pay 52 VND (about 0.0024 USD) per cubic metre of produced clean water, and eco-tourism businesses pay 1–2% of their revenue<sup>8</sup>. The Vietnam Forest Development and Protection Fund (VNFF) has been established at the central and provincial levels to collect and distribute ES payments. Ten percent of the payment is used for fund administration and operation while 90 per cent is for direct payments to forest owners for forest protection. The operation of the PFES programme is completely dependent on the Fund. At province level, provincial forest protection and development fund (FPDF) is responsible for signing contracts with buyers and collect payments, preparing payment plans, monitoring and disbursing payments to service suppliers and report to the VNFF. Figure 2.1 illustrates the arrangements, as well as the roles and responsibilities of stakeholders in the PFES programme (Thuy et al., forthcoming).

<sup>8</sup> These rates of payment are regulated in Decree 147/2016/ND-CP of the Government issued in 2016 that aims at increasing the fees paid by hydropower plants and water supply providers as regulated by Decree 99



**Figure 2. 1 Institutional arrangements, roles and responsibilities of stakeholders in the PFES programme**

To date, the PFES programme generates 55 million USD annually (VNFF, 2014). As of December 2013, about 4.1 million ha of forests (40.39% of the country's total forest area) have been covered by PFES. Forty (40) out of 63 provinces of Vietnam have established PFES steering committees, of which 36 provinces have established FPDF, and 31 provinces have established fund management units to oversee PFES implementation (VNFF, 2014). The widespread of PFES has been supported by the government as it is expected to deliver three social, economic and environmental objectives: improving forest quality and associated ecological functions, increasing the forestry sector's contribution to the national economy and reducing the state's financial burden for forest protection and management, and enhancing social well-being (To et al., 2012; VNFF, 2014).

## 2.2 Methods

### *Documents review*

Several documents were reviewed for this study, including government strategies, action plans, degrees, and reports. The review focused on key aspects: i) legal policies promoting emission reductions from deforestation and forest degradation, as well as promoting forest carbon conservation and the enhancement and sustainable management of forests (REDD+) and PES, including the engagement of the private sector; and ii) institutional settings for the implementation of REDD+/PES.

### *Online survey*

An online survey was held for existing and potential ES buyers in Vietnam. 59 out of 105 company/organisational representatives accepted our invitation to the survey (Table 2.2). The online survey questionnaire had four sections: i) general information on the company; ii) understanding on PES/REDD+ (legal framework; buyers and sellers; payments, impacts etc.); and iii) perspectives and willingness to engage in REDD+/PES scheme operations. The respondents were divided into two groups: (i) current ES buyers, which are companies mandated to pay a fix amount regulated by Decree 99, such as hydropower plants, water-supply and eco-tourism; and (ii) potential ES buyers, which are ES beneficiaries mentioned in Decree 99 but not yet required to pay e.g. aquaculture farms, carbon brokers, and food processing factories (Table 2.2).

**Table 2. 2 Respondents of the online survey**

Companies/ business type	Payment for ES status	Number of invited respondents	Number of actual respondents			Response rate (%)
			Total	State-owned	Private	
Hydropower	Current ES-buyer	20	16	1	15	80
Water supply	Current ES buyer	20	10	5	5	50
Ecotourism	Current ES buyer	10	5	0	5	50
Food processing	Potential ES-buyer	15	6	0	6	40
Agri-business	Potential ES buyer	15	7	1	6	47
Aquaculture	Non-ES buyer	8	6	0	6	75
Ecotourism	Potential ES buyer	10	6	1	5	60
Carbon brokers	Potential ES buyer	7	3	0	3	43
Aquaculture	Non-ES buyer	8	6	0	6	75
Total		105	59	8	51	56

Notes: 1- State-owned company: the state owns 100% of the chartered capital; 2- Private company: not belonging to the state economic sector.

### *In-depth interviews*

The online survey was followed by in-depth interviews with national-level policy makers, scientists, NGOs, and 53 online survey respondents. The aim was to probe some issues emerging from the online survey. The data gathered from the online survey and interviews were analysed to determine (i) the categories and characteristics of ES buyers; (ii) ES buyers' willingness to engage in PES schemes; (iii) their willingness to

share profits for ES; and (iv) expectations of existing and potential ES buyers towards the PFES policy.

### *Case study in Bac Kan province*

Through literature and document reviews, we found that existing literature mostly focuses on the government-led PFES rather than PES-like schemes initiated by various NGOs and institutions in the country. These initiatives, if any, would provide valuable inputs to PES policy design, especially regarding the stakeholder engagement aspect. Therefore, we conducted a case study in Bac Kan province to improve understanding of how voluntary PES schemes work in Vietnam. During the case study, key informant interviews (KI) were held in Ba Be district where a voluntary PES was being piloted. A total of 15 informants were selected randomly, of which 6 were service providers, 7 buyers (home-stay and boat services) and 2 were representatives of Ba Be National Park and the Village Fund Management Unit. The interview focused on the following aspects: (i) motivation of sellers and buyers; (ii) the PES scheme design; (iii) management of the PES revenue; (iv) how the agreement between service providers and users was reached; and (v) perceived impacts of the PES scheme.

Ba Be district locates in Bac Kan province, northeast of Vietnam. The district size is 68,545 ha, with a population of approximately 47,000 people in 11,000 households. The district is home to Ba Be National Park, a Ramsar site and one of the ASEAN Heritage Parks. Agriculture and forests play a central role in local households' livelihoods. While 88% of total area is institutionally defined as "forest land" and most of the district is mountainous, there is a little agriculture land available for production. Shortage of agriculture land has clearly impeded local livelihoods and led to a poverty rate as high as 44% in 2010. In this context, PFES and other programs providing incentives for forest conservation are expected to play a key role in delivering the dual goal of conservation

and economic development of the district. In practice, Ba Be district has been targeted as an important site for piloting and implementing various conservation programs including PFES, REDD+, and forestry and livelihood projects led by NGOs.

## **2.3 Results**

### **2.3.1 Categories and characteristics of ES buyers**

There were three main groups of current ES buyers identified in the survey, namely hydropower, water supply and eco-tourism. Interview results show that private, joint stocks and state-owned hydropower companies are paying for water regulation and soil erosion control in watersheds where they are operating, or where water is drawn from. Similarly, sustainable supply of potable water is paid for, by state, private or joint-stocks owned companies; whilst landscape beauty and recreation are paid by privately-owned eco-tourism companies. All ES buyers strictly followed the provisions of the PFES programme embodied in Decree 99, with respect to the payment level and transfer mechanism.

The main source of ES revenue is mainly hydropower enterprises, accounting for 98% of total revenue, followed by water supply companies (1.9%) and ecotourism businesses (<1%) (VNFF, 2014). Most hydropower companies are privately-owned, and the amount paid for ES is added to the electric tariff, which in turn, is absorbed by consumers. The total energy output of all hydropower companies in Vietnam is 48% of the national output, of which only 15% comes from small, privately-owned hydropower companies (EVN, 2013).

### **2.3.2 ES buyers' willingness to pay**

Currently, 80% of eco-tourism, 100% of water supply and 81% of hydropower companies are involved in the PFES programme in which, as mentioned above, about US\$ 55 million have already been generated. The reasons as to why buyers are paying



for ES vary, but the top four are regulatory compliance (69%–100%), securing business sustainability (56%–70%), securing supply of natural resources (40%–90%), and improving the company's 'green or environmental' image (30%–63%) (Table 2.3). Other authors such as To et al. (2012) also noted that the PFES programme is a regulatory mechanism that relies heavily on government structure and central command.

The survey revealed that the PFES programme is well known only amongst government officials and personnel. Conversely, more than 50% of the interviewed companies (food processing companies, agri-business, carbon brokers) do not know about PFES. Interviews with owners of aquaculture farms in Ca Mau province revealed that they have never heard about the PFES policy.

**Table 2.3 Reasons for paying ES**

Reason for paying ES	Hydropower companies (%)	Water supply companies (%)	Ecotourism companies (%)
1. Compliance to Decree 99	69	90	100
2. Securing the supply of natural resources	81	90	40
3. Securing business sustainability	56	70	60
4. Improving the company's 'green environmental'	63	30	40
5. Access to certain resources	31	40	40
6. Better relations with regulators, supporting formal licences to operate in the future	13	10	20
7. Securing a licence to operate / risk management	31	10	-
8. Business opportunity	6	-	0
9. Better relations with local communities, supporting informal licences to operate	0	0	0
10. Charity or philanthropy	0	0	0
11. Others	0	0	0

The views of ES buyers on sharing profits for paying ES also vary greatly. Clearly, no company is willing to allocate 5% or more than its profit to pay for ES. The survey results

show that 38% of hydropower, 70% of water supply, and 60% of eco-tourism companies are willing to share <5% of their profit for PES. Furthermore, 44%, 20% and 40% of respondents from hydropower, water supply, and eco-tourism companies respectively, are willing to follow the payment level required by the government, if it does not exceed 5% of their profits (Table 2.4).

**Table 2. 4 Willingness to share profits for PES**

Share of profits for PES	Hydropower (%)	Water supply (%)	Eco-tourism (%)
Above 5%	0	0	0
Under 5%	38	70	60
Follow the regulations	44	20	40
No preference	19	10	0

As mentioned above, the second group of respondents in the survey consists of potential ES buyers. We were interested in their views and willingness to engage in PFES schemes. In contrast to 33% of eco-tourism and 67% of aquaculture companies, the food-processing and agri-business companies, as well as carbon brokers are currently not willing to pay for ES. However, most of them (80%) recognized the relevance and importance of PES to their business operations and would pay for ES upon the establishment of a PES mechanism for their sector (Table 2.5).

**Table 2. 5 Willingness to pay by potential ES buyers**

Willingness level	Food processing (%)	Agri-business (%)	Aquaculture farms (%)	Ecotourism (%)	Carbon brokers (%)
Very willing	0	0	67%	33%	0%
Willing	67	57	17%	67%	67%
Not so willing	17	29	0%	0%	0%
Not willing	17	14	17%	0%	33%

### 2.3.3 Delivery of environmental services

As shown above, most buyers participate in the PFES programme to comply with the policy, although ES delivery is also expected. However, according to Thuy et al. (2012), ES buyers in Vietnam have not been presented with a report showing quantifiable impacts of their payments on ES. The author added that since there is no monitoring and evaluation system in place to quantify the ES delivered, buyers often wonder on the actual benefits gained from the PFES deals. Our survey however, showed ambivalent results -75% of hydropower and water supply companies felt that the expected ES had been delivered, while eco-tourism companies mostly (60%) reported otherwise (Table 2.6). The lack of information on the impacts of PFES may demotivate ES buyers.

**Table 2. 6 Assessment of ES delivery by buyers**

Did the PFES deal delivered the expected ES?	Hydropower (%)	Water supply companies (%)	Eco-tourism companies (%)
Yes	75	90	40
No	6	10	60
No reply/no information	19	0	0

### 2.3.4 ES buyers' view of the PFES policy

The PFES policy regulates several environmental services, but only three services have been paid for so far—these are soil conservation and water regulation in watersheds, and landscape beauty for recreation and eco-tourism activities. The current PFES scheme views ES buyers as regulatory payers whose behaviour is regulated by policy. However, of the participants in our study, 81% of hydropower and 90% of water-supply companies also considered paying for ES a way of securing natural resources (see Table 2.3 above). This means that the PFES policy is not necessarily viewed as a 'coercive' measure. The view of potential ES buyers is somewhat similar to the views of current buyers. The survey shows that over 85% of potential buyers recognized the importance

of ES provision to their business, in that, they would benefit from ES (see Table 2.7). The survey also showed that on average, 75% of potential buyers were 'willing' or 'very willing' to pay for ES. They also find the PFES policy effective in amassing funds for forest conservation, which could promote fairness and equity for forest owners. It is therefore posited that PFES is relevant to the business sector, and its current scope can be expanded to cover non-paid environmental services such as carbon sequestration and provision of spawning grounds for aquaculture.

**Table 2.7 Appreciation of ES by potential buyers**

Statements	Agreement rate (%)
ES is important to the company's business	85
The company is expecting benefits from ES	86
The company is not expecting benefits from ES	14
The company is willing/ very willing to pay for ES	75
The company is 'not so willing' / 'not at all willing' to pay for ES	25

A potential constraint to the implementation of PFES is that the willingness to pay will likely decline, if companies find that their payments benefit other beneficiaries who do not pay (so-called free riders), or even their competitors. In our survey, only eco-tourism companies were fairly certain that their payment (for ES) will not benefit their competitors (80% confirmed). In contrast, this percentage of hydropower and water supply companies was only 38% and 50%, respectively. This result can be explained by the nature of ES involved in each business; water flow from the forest to end-users is hardly monitored by ES payers, while landscape beauty is fixed to a certain border where the entrance can be easily tracked.

**Table 2. 8 Buyers' uncertainty on free riders and competitors in PFES deals**

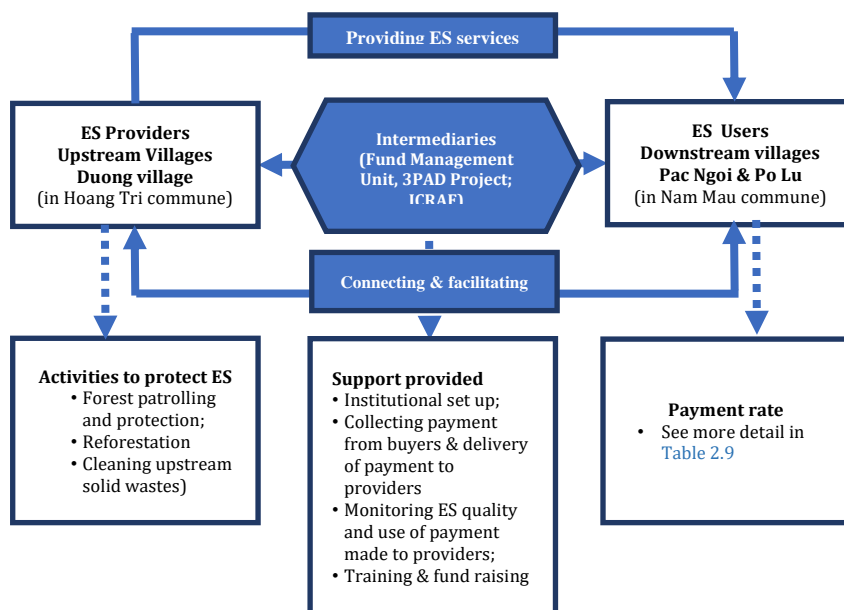
PES scheme benefits competitors	Hydropower (%)	Water supply (%)	Eco-tourism (%)
Yes	0	0	0
No	38	50	80
No reply/no information	62	50	20

### 2.3.5 Case study: Voluntary PES scheme in Bac Kan province

The national PFES policy allows ES beneficiaries to either pay indirectly through Vietnam's Forest Protection and Development Fund or directly to service providers. In our online survey, all enterprises engaged in PFES took the first option, that is "payment made with the intervention and support of the state and with prices of forest environment services regulated by the state". Indeed, this is a mandatory participation (Kolinjivadi & Sunderland, 2012). In the case of direct payment, providers and users of forest ES are able to negotiate and agree on the PES contract with payment rate now lower than the regulated rate set by the government for the same ES. However, there has been no further regulation or guidance for the negotiation between stakeholders, making it a blind option for both parties. Without the facilitation of a third party, actual negotiation and contract arrangement are unlikely to be realised.

Our case study explored a voluntary PES scheme initiated in 2013 under the support of the Bac Kan Pro-Poor Partnership for Agroforestry Development (3PAD) project and funded by the International Fund for Agriculture Development (IFAD) in Ba Be District (see Figure 2.2 and Table 2.9 below). The aim was to facilitate downstream communities to voluntarily pay upstream communities for the conservation of forests and to control water pollution. The scheme involved 29 households in the upstream Duong Village (ES providers) and 33 downstream stakeholders, mainly home-stay owners in Pac Ngoi village, the boat service cooperative, and the Ba Be National Park (ES beneficiaries). Intermediaries were 3PAD project and Fund Management Unit-FMU (operational support and in-kind contribution), and the World Agroforestry Centre (ICRAF) (technical support). The payment collected goes to an environmental protection fund set

up in Pac Ngoi village. The FMU was set up to manage this fund with volunteer members such as the head of Pac Ngoi village, a commune police and a representative of the Commune People Committee. The FMU is responsible for payment collection, fund management, and reporting, which is done every 6 months.



**Figure 2. 2 Voluntary PES scheme in Ba Be District, Bac Kan province**

By the time the voluntary PES scheme was developed, only 18 out of 96 households in Pac Ngoi village have provided home-stay services to 2,500 tourists annually. The boat service cooperative has about 100 boats, servicing tourists around Ba Be Lake. Park officials estimated between 50,000 and 60,000 visitors annually. Until the end of 2014, all homestay service running households of Pac Ngoi villages have already contributed to the environmental protection fund managed by the FMU. However, the Ba Be National Park had not. It was found that the Park was willing to fulfil their financial commitment by using park entrance revenue, but the Bac Kan Provincial Financial Department disallowed the payment, as it was not in accordance with Decree 99.

**Table 2. 9 Voluntary ES buyers and payment rate**

ES buyer	Payment rate (committed)
33 households providing home-stay services in Pac Ngoi and Po Lu villages	0.18 USD per visitor who uses the homestay service
Boat service cooperative	2% of its annual revenue (1% paid by members of boat service cooperative and 1% by the cooperative)
Ba Be National Park	~ 1,820 USD per year
Cultural performance group active in Ba Be Lake area	2.3 USD per show

(Note: the exchange rate of USD/VND is fixed at 1 USD = 22,000 VND)

In 2013, a one-year agreement was signed between representatives of Pac Ngoi village, the FMU and Duong village around the payment scheme and the obligations of sellers/providers and buyers/users. Villagers in Duong village and the FMU agreed to the use and management of payment. In 2013–2014, the FMU has paid 1,163USD to Duong village for the following activities: (i) Regular forest patrolling and forest protection (20% of the payment); (ii) Reforestation activities (30% of the payment); (iii) Micro-credit issued to village women for livelihood improvement (30% of payment); (iv) Cleaning activities (10%); and (v) Other public activities of the village (10%). It was reported that all households in Duong village are involved in and have complied to the conditions set forth in the contract. So far, the more visible impacts of this voluntary PES scheme as perceived by interviewed villagers are (i) Improved protection of forest areas by villagers (ii) Improved village sanitation through waste collection; and (iii) 100% repayment of the loan taken by 10 households for pig farming.

The 3PAD project has supported this voluntary PES scheme by making all the necessary institutional arrangements, building the capacity of both upstream and downstream farmers and providing some infrastructure investments (such as solar power lighting, waste-collection boxes, and speakers for the cultural performance team) in Duong and Pac Ngoi villages. Direct support in form of materials and technical assistance for the

construction of a 500-metre irrigation system for 19.7 ha of paddies in Duong village, construction of the lighting system for the footpath along Ba Be Lake in Pac Ngoi and Po Lu villages, and promoting eco-tourism activities such as website development, and trash bins for waste collection. Unfortunately, the PES scheme worked well for one year only. At the time of the interview (August 2015), the FMU was no longer functioning due to the following reasons: (i) There was a change in the village and commune leadership, which meant the reconstitution of the FMU; (ii) Staff support from the 3PAD project has reduced as the project was already coming to a close; and most importantly (iii) Local authorities such as the police had stopped monitoring the payment by home-stay service providers and did not follow up to extend the PES contract. These changes have resulted in the delay of payment collection. Although both providers and users expressed their wish to extend the PES contract, they did not know how to maintain the scheme without the facilitation of, and support from 3PAD and local authorities. This highlights the critical role of facilitators in voluntary PES schemes.

## **2.4 Discussion**

### **2.4.1 ES valuation and marketability**

The principal strength of a true PES scheme is its market-based nature (Talberth, 2015), that is the actual demand for ecosystem services will trigger financial rewards or payment to landowners in return for those services. If PES in Vietnam is considered a market device in natural resources management, ES valuation must play a central role in its emergence, determining both beneficiaries' willingness to pay (WTP) for the services and willingness to accept (WTA) the PES contract by adopting good land use practices or forgoing undesired land use practices that would negatively affect ecosystem services delivery. For this reason, setting up a PES programme is considered information and knowledge intensive (Leimona et al., 2015).



The PFES programme in Vietnam somehow by-passed this information burden by setting up fixed prices for ecosystem services that seem to be acceptable for both suppliers (who often receive 3 USD to 10 USD per ha of forest annually in other government supported forestry programs) and users (who will pass on the payment duty to water and electricity users). Prior to the issuance of Decree 99, there was a number of studies on valuation of all forest direct uses and other ecosystem services (ADB, 2010; Nama et al., 2005; Phuong & Duong, 2007, Quynh, 2010; Tri, 2000; Vu, 2009), and valuation of specific ecosystem services such as forest biodiversity (Do & Bennett, 2007; Hoa & Ly, 2009; Thuy, 2007), watershed services (ADB, 2010; Kuchelmeister, 2003; MARD, 2008), forest carbon sequestration (Que, 2006; Tri et al., 1998; Vu, 2009). These studies, although mostly focused on some specific parts of the country and employed different methodologies, could provide valuable information to policy development. Nevertheless, how and to what extent they were considered in development of Decree 99 were not clearly defined in public consultations. One possible explanation is that these valuations are more aligned geographically with the sellers and buyers than the ecosystem boundaries and jurisdictional boundaries as in the case of PFES (Talberth, 2015). However, the most likely reason is relevant to the very large transaction costs expected for ES valuation and assessment of demand and supply, that can completely exceed the net gain from PFES. As a result, the Government had to impose regulations over PES as the best alternative to the costly negotiations (Coase, 1960).

The transaction costs of PES design and implementation are not solely dependent on measurement and evaluation costs, but also heavily impacted by the physical characteristics of the service (Alston et al., 2013). It was found that transaction costs are the least for club goods like water and greatest for pure public goods like carbon reduction, and this has a great implication on PES performance (Alston et al., 2013). In

the case of PFES in Vietnam, there are three broad types of ES: (1) watershed services; (2) carbon sequestration; and (3) biodiversity and scenic beauty. The physical characteristics of the service vary across these services, and thus their marketability as discussed below.

First, if the forest ES and their subsequent benefits are rival, rational buyers would secure the ES on which the success of their business depends by paying for them, assuming that payment guarantees ES provision; otherwise, commodification of non-rival resources is neither efficient nor fair (Farley & Costanza, 2010). In our study, hydropower and water-supply companies were very positive toward securing their supply of natural resources, as their willingness to pay for this reason was 81% and 90%, respectively. This indicates the rival characteristics of watershed services which are the primary ES that these companies pay for. PFES revenue generated from hydropower and water supply companies are also largest among buyer groups (Pham et al, 2013). In contrast to hydropower and water supply companies, only 40% of eco-tourism companies were willing to pay for forest environmental services (FES) to secure landscape beauty. This could be due to the low rivalry in landscape beauty as an environmental service, as alluded to in the literature (Bouma & Beukering, 2015; Fisher et al., 2009; Vries, 2013). Atmospheric carbon sequestration is purely a public good (non-rival and non-excludable by nature) (Aston et al., 2013), and thus has the largest transaction cost and the least marketability. Practically, although mentioned in Decree 99, payment for this service has never been specified, and has been hanging for international support including the REDD+.

Second, the excludability of goods depends on three factors: (i) whether providers can exclusively claim the goods that they provide; (ii) whether the buyers have excludable rights to the goods that they pay for; and (iii) whether exclusion can be practically

enforced through either institutional or cultural mechanisms. If ecosystem services have 'open access' (non-excludable) features, there is a clear disincentive for investment, thus a market policy hardly works for them. The fact that 62% of hydropower companies and 50% of water-supply companies in our study had no idea whether their PFES deal benefits competitors indicates high uncertainty about the excludability of forest ES among buyers. According to [Farley & Costanza \(2010\)](#), excludability ranges from fairly simple to impossible, and is heavily influenced by the spatial distribution of the service in question. They argue that ES surrounding water provision and regulation are directional and technological measures (e.g. hydroelectric dams and irrigation systems) that can help to exclude intermediaries, thus facilitating market-like payment schemes for these services. While this may be true if buyers are end-users of the service, the case in Vietnam is different. According to the Law on Water Resources (2012), hydropower dams (except small-scale ones) must meet multiple objectives, meaning that they should not just be generating hydroelectric power, but also be storing water for downstream irrigation and buffering downstream water level during the rainy season. As farmers downstream are not tied to irrigation fees according to the law (Government's Decree 143/2003) and the public is not required to pay for flood prevention services, they become free riders in this case. Similarly, it is difficult, if not impossible, to exclude downstream communities from benefiting from improved water quality associated with forest regeneration upstream whether they pay for clean water services or not ([Landell-Mills & Porras, 2002](#)). This is true for Vietnam, as the legal framework does not sufficiently support the excludability character of forest products and services, since the land and all its natural resource endowments are constitutionally public goods managed by the state. Hence, although farmers can extract benefits from the forest, including ES payments as provided for in several policy documents such as the Law on Forest

Protection and Development, Biodiversity Law, and Vietnam's Forestry Development Strategy (2006–2020), they have no right to exclude others from enjoying the ES provided.

The same rules can be applied to buyers. Although excludability seems relatively simple in the case of landscape beauty, the way it is defined by Decree 99 as protection of natural landscape and conservation of biodiversity of forest ecosystems for tourism services implies a technical constraint for excludability. While one can only enjoy a park's landscape beauty after paying the entrance fee, the benefits of biodiversity conservation, for example, nutrient recycling or pollination for crops, clearly extends beyond the park's boundary. This is further complicated by the overlapping roles of buyers and suppliers. National park and protected area authorities are suppliers by law because they are land managers. At the same time, however, they can be considered buyers because they are providing tourism services, as well as intermediaries because they do contract with, and channel payments to households, making tourism PFES difficult to apply and controversial (Pham et al., 2013). Our study on the voluntary PES scheme in Bac Kan shows similar results where Ba Be National Park was willing to pay for upstream households for protecting the forest (in this case, they would act as a buyer), but Bac Kan's Department of Finance disallowed it because it considered Ba Be National Park as a provider, not a buyer of the service.

The challenges in valuing ES and enhance ES marketability as discussed above highlight is a need for the research community and development agencies to collaborate with government agencies in generating necessary information on ES that can be used to estimate the overall size of the market—demand and supply quantities, and to provide technical solutions towards marketability enhancement. Herein, boundary work, the process through which the research community organises its relations with the worlds

of action and policy making, is very important. While studies on ES in Vietnam are scattered and often resulted in very coarse-level estimates of ecosystem service values per hectare for each ecosystem type, comprehensive studies such as of [Leimona et al. \(2015\)](#) who compiled boundary work for payment for watershed functions in Indonesia, are critical to PFES development as a real market instrument. This is even more important in the context that green economic growth policies in Vietnam have the potential to enhance the net present value of ecosystem services from natural forests, freshwater wetlands, mangroves and coral reefs by more than 8% over a business as usual scenario, and increase funding to ecosystem conservation inside and outside protected areas to 25% of public funding to protected areas ([Emerton, 2013](#)).

### 2.4.2 The role of the government

Before the PFES policy, Vietnam's government has acted as the largest buyer of ES through the 661 programme, which included many different types of direct and indirect incentives and/or payments to forest dwellers to protect and plant more trees in forest areas. However, this approach has created a public finance burden, and so the PFES programme was initiated to fill in the financial gap by collecting payments from direct institutional ES users, primarily state- and privately-owned companies whose business operations rely on ES. In this case, the government has made use of the idea of market environmentalism to mobilise additional financial resources to implement the government's policies in forest protection, rather than privatisation or decentralisation of resources management ([Suhardiman et al., 2013](#)). Some authors, including [McElwee \(2012\)](#) and [Pham et al. \(2013\)](#), reported that the state is the major shareholder of many ES buyers such as the Saigon Water Corporation (SAWACO) for clean water supply and Electricity of Vietnam (EVN) for reduced soil erosion and sedimentation, and are thus, buyers of ES. State-owned enterprises are however tricky, as most of them have turned

into profit-oriented entities, as opposed to the definition of state enterprises by the Law on Enterprise (2014)<sup>9</sup>. These state-owned enterprises are practically no longer in the public-sector domain—their payment for forest ES should therefore not be seen as a form of public financing. Indeed, Decree 99 and its subsequent regulatory documents marked the evolution of the government’s role from being principal buyer to that of a regulator of PES. The regulatory role of the government is more useful, especially to kick-start the process in the incipient stage (Scherr & Bennett, 2011), but such a role should not be static, as certain conditions require governments to change their roles.

The voluntary PES scheme investigated in this study highlights the need for government involvement as a PES enabler. The business case for this was strong (i.e. both buyers’ willingness to pay and providers’ willingness to accept were high), but contract implementation could not be sustained because local government agencies were reluctant to co-operate. The Commune People’s Committee, National Park, and Police Department were not incentivized to fully support PFES, either institutionally through a higher-level government request or financially through a share of the PES revenue. Even if they would like to support the scheme without incentive, there is a risk of being ‘politically incorrect’ by trying new practices outside the current legal framework. Although Decree 99 mentioned ‘direct payment’ (implying voluntary PES), there has been no further guidance or policy document on measures to implement it. Focus has been on compliancy PES only. Pham et al. (2013) also found institutional gaps in implementing PFES policy in Vietnam, as local officials are strongly risk-averse and despite a high level of administrative decentralisation, they tend to wait for guidelines from the central government for fear of making a wrong decision. Indeed, Decree 99 may

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<sup>9</sup> According to the Law on Enterprise of Vietnam (2014), a State Owned Enterprise should have 100% of its capital invested by the State. In SAWACO’s case, the state owns a mere 51% of the shares.

even undermine efforts of intermediaries, in this case 3PAD project, because it allows buyers and local governments to issue payments without the need for negotiation. Intermediaries play critical roles in developing capacity, influencing policy priorities, promoting learning, sharing knowledge and bringing stakeholders together (Pham et al., 2010). Many intermediary-NGOs, such as ICRAF, the International Union for Conservation of Nature (IUCN), Birdlife International, Care International, and Winrock International, have introduced PES to the country before (McElwee, 2012). However, their activities are project-based, so the government should be more active in taking over this role, to ensure the sustainability of the PFES programme.

### 2.4.3 Engaging the private sector in PFES

Buyers investigated in this study are obligatory buyers who, by law, mandated to offset their environmental impacts (Milder et al., 2010; Scherr et al., 2004). Clearly, the main reason for paying ES was to comply with the PFES policy. Despite other motivating factors, this may not guarantee that the payment will continue once the government ceases the PES regulation. Fortunately, the perception of “environment is a burdensome” among business and investors is now changing (Lambooy & Levashova, 2012). Even with weak business cases, the private sector may still want to get involved in ES market for reasons including ethical motivations, social responsibility, image, or softening the relationship with local communities. For example, Koellner et al. (2011) reported willingness to invest (WTI) for forest ecosystem services of firms in Costa Rica and found that direct financial benefit had marginal influence over WTI, and that national firms have greater interest (than international ones) in protecting their national ecosystem services with local benefits. Our study has shown that apart from regulatory compliance, securing sustainable supply of natural resources, business sustainability, and maintaining green image are important reasons for companies to buy ES. Many of them

(38%–70% of different business sectors) were willing to share their profit for PES, which could be higher than the current regulatory rate in some cases. Seventy-five per cent of potential buyers are willing to pay for ES, indicating a high potential for expanding PFES to other types of ES buyers. While this may not reflect a growing demand for ES, it clearly is a good signal for engaging the private sector in the PFES programme.

It is acknowledged that there is enormous potential for PES if the market failure is addressed (Villamor et al., 2007). Our study found that poorly defined ES and low levels of both rivalry and excludability of ES have undermined the business case for PFES in Vietnam. While increasing artificial rivalry should be avoided because it will reduce use and hence the value of natural resources (Kemkes et al., 2010), increasing excludability can and should be done through clarification of tenure rights (for supplying functions) and legal enforcement (for creating and maintaining demands). Legal regulation and incentivizing policy that either require or encourage ES users to share responsibility for conserving and maintaining ES, e.g. certification schemes, could also help to draw more resources towards commoditisation of ES (Koellner et al., 2011). Again, the commoditisation of ES will only be feasible if excludability is secured at a certain level, and strict enforcement will likely accelerate the process of market liberation for ES (Villamor et al., 2007). While waiting for enforcement capacity to be realised, and while ES under the PFES policy are poorly defined, measured and monitored, it may be better that buyers pay for a bundle of ES (rather than single ES) and in the form of a reward for forest-conservation practices, than payment per se. This would help to temporarily eliminate technical and financial constraints around setting up baseline and monitoring PES schemes.

Nevertheless, improving the monitoring and evaluation of PFES in Vietnam should be considered urgent. The current system rather focuses on accounting of revenues



generated from ecosystem services buyers than the ecosystem services themselves. Both suppliers and beneficiaries are lacking information of the actual quantity of services generated by forests and how it is impacted by management practices (Pham et al. 2015). There has been no monitoring of actual impacts of PFES, and the government has not yet applied the coefficients for payment that could better reflect the causal relationships between payment rate and ecosystem services delivery (Suhardiman et al., 2013). Moreover, without knowing how well their payment has been spent through a monitoring and evaluation scheme, business sector will be discouraged to engage further in PFES.

To further engage private sector in PFES policy, our recommendations are: (i) raise the awareness of private sector about the PES concept and the importance of securing ES to their business; (ii) conduct studies on payment mechanisms for ES that are on-demand but have not yet been regulated by Decree 99; (iii) establish a reliable system for measurement and monitoring ES is needed, particularly of the hydrological impacts of land use change (including forest) as it has been drawing the largest amount of PFES revenue from business sector; and (iv) renovate the current PFES institutional structure so that the government's Forest Protection and Development Funds (central and local levels) may move beyond their current limited role as payment collectors and distributors, and instead play a more active role in facilitating negotiations between buyers and sellers, and seeking additional investment from different actors (like FONAFIFO in Costa Rica).

## 2.5 Conclusion

The national PFES policy in Vietnam has generated ES payments for forest protection and development. Currently, most PFES deals are considered regulatory compliance rather than voluntary transactions, but there are new and potential buyers who

recognize the benefits of paying for ES to secure their business operation. This signals the liberation of ES market in the country. However, the PFES market is also challenged by the lack of information on ES valuation and lack of rivalry and excludability elements of ES, that are crucial to PES deals. This could hinder the emergence of voluntary PFES schemes. We recommend that, while continuing to implement the regulatory PFES, the government should expand the range of payable ES, encourage more private sector buyers, and play a more active role as facilitator and enabler in the national PFES programme.

### **Acknowledgement**

This paper draws on research conducted as part of Secured Landscapes project funded by NORAD (Grant Number NORD-1069). We would like to thank all participants who involved in our surveys and warmly answered all of our questions.

### **3. Payment for forest environmental services in Vietnam and views on its success: a Q methodology study**

Do Trong Hoan, Bas Arts, Verina Ingram, and Meine van Noordwijk

The contents of this chapter will be submitted to Forest Policy and Economics as:

Do, T. H., Arts, B., Ingram, V., & van Noordwijk, M. (*in preparation*). Payment for forest environmental services in Vietnam and views on its success: a Q methodology study. *Forest Policy and Economics*.

## Abstract

Payments for Ecosystem Services (PES) schemes incentivize land managers to maintain, restore or enhance ecosystem services. In Vietnam, the government and other stakeholders adopted a nation-wide Payment for Forest Environmental Services (PFES) that largely relies on pre-existing forest governance structure. In this article we explore the discourses that underpin PFES debates and practice in Son La province, one of the first provinces to implement PFES in Vietnam. Informed by interviews with PFES actors and Q-methodology, we identify three meta-discourses on PFES: state-controlled, state-neoliberalism, and PES. These meta-discourses reflect the transition of the economy and forest governance practices in Vietnam. Analysis of these meta-discourses showed a rather high level of social acceptance of PFES policy, and also indicated that PFES success will serve as an important ground for the state to intensify its authoritarianism over forest resources. The narratives diverge in their perception of PFES's fundamental principles influenced by transformation in economic development and forest governance; their perceived PFES performance and effectiveness; the intrusion and integration of PFES into forest policy landscape; and the actual motivation of paid local farmers participating in forest protection activities. With expansion of state power in forest governance, concerns remain mostly on how PFES delivers desirable economic and environmental outcomes without an accountable monitoring system that is detachable from political interests, and how to empower local farmers in participating in PFES decision making and implementation.

### 3.1 Introduction

Over recent decades, environmental concerns have become part of the political and economic agenda at both international and national levels (Colombo & Porcu, 2014; Balbi et al., 2022). Market based approaches are increasingly used in environmental policies as Coase theorem (Coase, 1960) that advocates for the role of competitive market in solving natural resources and environmental management issues prevails. In developing countries, the integration of ecological issues into neoliberalisation processes is still a new concept and its operation, if any, is still in an infancy stage. Even in more developed countries, there remains a tendency to treat the various policy instruments as alternatives to one another rather than as potentially complementary mechanisms that can be combined to address environmental concerns (Gunningham and Sinclair, 1999; Mazaheri et al., 2022).

Neoliberal environmental governance policies have been recently emerged in Vietnam's forest management regime. The Payment for Forest Environmental Services (PFES), Reducing Emission from Deforestation and forest Degradation (REDD+), and forest certification schemes are among the most significant ones. Theoretically, this market-based management will be more efficient in allocating resources for conservation than the conventional "command-and-control" approach in developing countries (Wunder, 2005) as it addresses market failure by altering the economic incentives of land managers (Landell-Mills & Porras, 2002; Farley & Costanza, 2010; Hellen, 2011; Corbera & Izquierdo-Tort, 2023). However, this may not be a magic wand as economic based instruments need certain politico-economic conditions to perform (Muradian et al., 2010; Martin-Ortega & Waylen, 2018). More particularly, some authors argued that Payment for Ecosystem Services (PES), a broader concept of PFES

and REDD+, would not work without regulations making ecosystem services tradeable goods (Landell-Mills & Porras, 2002; Guerry et al., 2015; Qiu et al., 2022; Bruno et al., 2023). It is very important to understand to what extent these policy instruments shape and are shaped by forest governance system in the country, thus inform policy design and implementation. This can be further informed by the discourse approach can offer both empirical insights and a range of policy recommendations (Wash, 2020). However, understanding forest governance discourses, or more broadly environmental discourses, upon which environmental policies are developed by the socialist government of Vietnam is limited. The Government's environmental and forest conservation policies (e.g. Vietnam's Law on Environmental Protection 2014, Forestry Development Strategy 2006-2020, Decree 18/2015/ND-CP of Government (2015) on environmental protection planning and strategic environmental assessment) are often based on over simplified arguments of ecological benefits, while environmental protection projects are often implemented under the influence of Western environmental projects or led by Western institutions. The academic literature on environmental discourses in Vietnam is often found in the economic and political studies, but less in the field of environment and forestry. Publications in the domain is either lacking or outdated. Consequently, the theoretical backing for forest and environmental policy making is considered weak. For this reason, research that employs discourse analytical frameworks in forest and environmental conservation in Vietnam is highly needed.

As sustainable forest management as a concept and practice emerged throughout the world, forest policy tools must adapt to recognize and achieve wide variety of ecological, economic, and social benefits (Cubbage et al., 2007; Colwell et al., 2014; Martin-Ortega et al., 2021). Market-based, neoliberal environmental policy instruments, most notably

Payment for Forest Environmental Services (PFES) and Reducing Emissions from Deforestation and Forest Degradation (REDD+) have emerged in Son La province, mostly as a result of larger programs developed at national level. Son La was one of the two provinces selected for PES policy piloting in Vietnam in 2008, and a provincial REDD+ action plan was also developed in 2015. However, actual REDD+ implementation has yet to be commenced due to lack of funding and undeveloped carbon market. Some other market-based instruments such as voluntary forest certification has not yet been popularized due to lack of markets for fast growing plantations in the northwest region, while large timber plantation models have yet to be developed.

The focus of this research is therefore the PFES, the most prominent market-based instrument (MBI) that is applied in Son La province. Despite Government's claims on PFES success, criticisms are numerous. [Trædal et al. \(2016\)](#) and [McElwee et al. \(2020\)](#) expressed concerns that PFES may resemble the existing forest management regime rather than improve it due to an interplay of institutional structures at multiple levels. [To et al. \(2012\)](#) argued that PES could instead further exacerbate pre-existing inequalities in forest land management. [Le et al. \(2016\)](#) found that farmers' participation in PFES is often considered as a duty just as it is in command-and-control policy, while [Pham et al. \(2013\)](#) suggested that the current approach to conditionality in Payments for Ecosystem Services (PFES) tends to benefit buyers rather than suppliers, which raises a valid concern regarding the voluntary participation of suppliers in PFES programmes. Overall, PFES effectiveness is questionable since an adequate monitoring and reporting system is not in place ([Pham et al., 2013](#); [Suhardiman et al., 2013](#); [Pham et al., 2015](#), [McElwee et al. 2020](#)). This context requires better understanding of perspectives and of stakeholders involved in governing the forest in the province, particularly those involved in PFES.

As in most remote, rural, forested, mountainous provinces of Vietnam, forest governance in Son La is embedded in the fundamental challenge of finding a balance between livelihoods and conservation, that is critical to sustainable development. Key limitations of the conventional state approach to forest governance taken in Vietnam, particularly before market-based economic policy instruments such as PES and forest certification were introduced to the country, are: (1) the sole focus has been on the forestry sector while forest dynamics is intricately linked with the wider natural resources management, agricultural and rural development sectors, and (2) that it has been based mainly on command-and-control policy instruments within a centralised institutional setting and land management regime (Sunderlin & Huynh, 2005; Nguyen et al., 2008; Tran and Burgers, 2012; Pham et al. 2014; Trædal et al., 2016) .

The aim of this study is to shed a light on forest governance discourses in Son La province, not to directly prescribe the forest governance itself. The Q-methodology is employed to collect and analyse statements of different stakeholders about the research subject in order to answer the following questions: (i) How is PFES perceived by stakeholders in Son La province?; (ii) How do local actors perceive PFES's performance economically, environmentally and socially?; (iii) To what extent is PFES blended with pre-existing policy instruments?; and (iv) Is the participation (of farmers) in PFES a response to the incentives embedded in PFES?

## 3.2 Materials and methods

### 3.2.1 Study site

This study focuses on in Son La province in the Northwest of Vietnam (Figure 3.1). The Northwest region has a very environmentally important role for development of northern Vietnam because it incorporates the catchments of the two main rivers in northern Vietnam, the Da and Hong Rivers. There are two big hydro-power plants on the



Da River in Hoa Binh and Son La provinces which contribute 20% of the total electricity production of Vietnam. Because of its environmental importance, about 60% of total natural forest area in the northwest was allocated to protective and special use forest. Son La has a total area of 14,124 km<sup>2</sup> with a total population of 1.248 million people (2019)<sup>10</sup>. The total forested land of the province is 666,888 hectares<sup>11</sup>, accounting for 45 per cent coverage of the local natural area. The province is home to 12 ethnic groups. It has the highest number of hydropower plants in Vietnam - currently 40, with a further 60 to be built soon. Large areas of forest in the province, most of which were already allocated to households, have been cleared for hydropower plants and many new settlements have been set up for villagers displaced as a consequence. Outside of the forested area, agriculture and other land use systems are scattered, and in views of many forest protection authorities, are threats to natural forest, especially shifting cultivation and monoculture tree plantations (Cochard et al., 2017; Pham et al., 2018a).

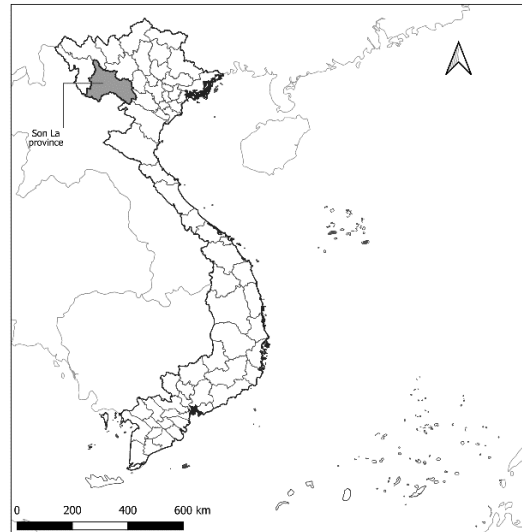
Forest and water resources in Northwest region of Vietnam used to be based on customary law, indigenous knowledge and traditional institutions (CIRUM, 2012). Due to major changes in the forest land management and administration system since 1960, the roles of state authorities such as district authorities, forest management boards (FMBs) and formally appointed village leaders have taken over traditional institutions (CIRUM, 2012, Ironside, 2017). Although decentralisation in forest governance has taken place since 1990s, it is still the state who stipulates how forest are managed (through top-down planning and policy development) while roles and decision-making powers of local communities in forest governance remain unclear (Bayrak, 2019). Although beliefs underlying customary law are still strong among some ethnics such as Thai people and

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<sup>10</sup> <https://link.gov.vn/igBZ97Ep>

<sup>11</sup> <https://sonla.gov.vn/>

customary rules and practices are to a certain extent still recognised, customary law has been in a process of breaking down and some parts of it have already been lost (Nguyen et al. 2008; CIRUM, 2012).

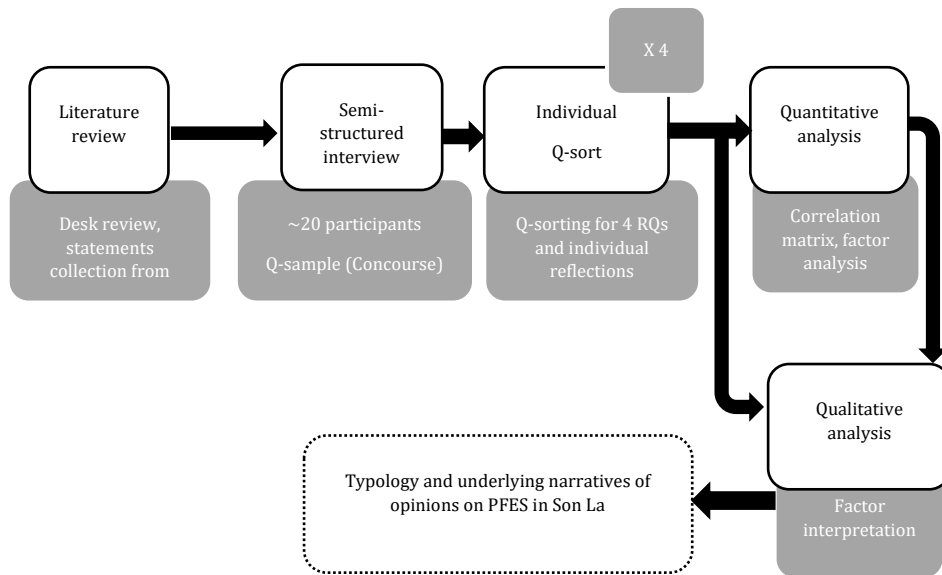


**Figure 3. 1 Study site –Son La province as a part of northwest region of Vietnam**

Son La is one of the two pioneer provinces in the country which piloted the implementation of PFES in nine administrative units as in accordance with the Decision No. 380/QĐ-TTg of the Prime Minister in 2008. Since 2011, this policy has been applied throughout the province, along the basin of Da River and Ma River. The accumulated PFES fee collected from hydropower and water supply companies during 2008-20200 was VND 1,644 billion. PFES is paid to over 43,000 forest holders in the province, many of them are poor, ethnic minority households. PFES payment covers over 600,000 ha of Son La's forest. In 2020, the average payment rate varies between VND 300,000 - 1,500,000/ha.year depending the watersheds that generate PFES revenue. PFES is a significant financial source that supports the local authorities and forest owners to sustainably use and manage forest resources.

### 3.2.2. Methods

The overall research process is summarised in [Figure 3.2](#). The first two-steps were to develop a Q-sample or “concourse” (a set of interrelated statements about the domain or topic in question). While the desk review was to collect statements about research questions from the literature (scientific literature, reports, briefs, media, guidelines), Key Informant Interviews (KII) were employed to gather statements about the subjects by participants of the study. The result of concourse development was Q-statements (exactly 40 statements for each RQ) that were inputs to individual Q-sort: each participant performed a Q-sorting for each of research questions. Reflections (of participants and observations by enumerators) on Q-sorting were obtained during the Q-sorts. Quantitative and qualitative analysis (factor analysis and interpretation) then followed using statistical analysis tools and software ([KADE](#) by [Banasick, 2019](#)) to understand how respondents arrive at their viewpoints. Herein we developed and analysed groupings of similar sorts based on correlations between sorts. Factor analysis provides idealised sorts representing each factor group. Qualitative interpretation of the ranking of statements by each factor group was used for understanding differences across groups.



**Figure 3. 2 Main steps of the study**

### 3.2.2.1 Steps 1&2. Concourse development: literature review and semi-structured interview

- ***Scientific literature***

We searched the literature in our own library and the electronic databases PubMed, Google, Google Scholar and JSTOR (1 August – 30 November 2020) using the following search terms (the search terms were also translated and used in Vietnamese) [PFES OR Payment for Ecosystem Services OR Payment for Forest Environmental Services OR PES] AND [Market-based OR Neoliberalism OR Forest Governance OR Policy OR Innovation OR Institution OR Decentralisation OR state-owned] AND [Participation OR Local communities OR Incentives OR Performance OR Effectiveness OR Awareness OR Rights OR Capacity] AND [Vietnam OR Son La]. We had no restrictions for publication date or language. Frequently appearing authors were entered manually in the

electronic database. All full-text articles published in English or Vietnamese were considered eligible. We have identified 39 statements from 15 scientific articles, mostly published after 2011, the year that PFES policy started to take effect.

- ***Reports, working papers, policy briefs, newsletter, workshop presentations, and guidelines***

Vietnamese and international governmental, institutions' for forestry, environment, and development' websites were searched for reports, (position) papers, working papers, vision statements, workshop reports and guidelines that related to PFES. We also searched for "Son La specific" reports and working papers in both English and Vietnamese languages. The nature of the documents comprised working papers (n = 14) (published between 2011 and 2018), governmental reports (n = 1) (2014), policy brief (n = 2) (2011-2018), and guidelines (n=1). These documents were scanned to identify quotes about PFES that are relevant to our research questions.

- ***Media***

As PFES is a relatively new policy in Vietnam, the policy implementation has received media attention. We identified media (newspapers and television programmes) as a source for collecting items about PFES by either experts or those directly involved in PFES. We have found a number of relevant media articles, mostly on "sectoral thematic magazines" such as official magazines of MARD and MONRE that can be used to enrich our statements population. Quotes were compared and discussed, and items were included after reaching consensus. We also scanned posts on a Facebook group for PFES in Vietnam, however this group mostly share experience and knowledge on how to map

forest boundaries that are not directly relevant to the subjects of this study. The titles of the media articles are available from the author.

- ***Portals***

Web-portal is often used by Government agencies in Vietnam to provide news and updates of the agencies themselves. These portals are somewhat different to the websites that often provide “wider” information and target wider audience. In many cases, they act as “internal newspapers” of the agencies. We searched the electronic portals of government agencies and selected portals of VNFF (Vietnam Forest Protection and Development Fund), Son La’s People Committee (Son La portal), and VNFF’s branch in Son La for statement mining. Items were included after reaching consensus.

- ***Interviews with research participants***

We conducted interviews with relevant stakeholders in Hanoi and Son La in October 2020 to gather their opinion statements on the research subjects. The total number of interviewees is 20. The number of interviewed stakeholders was identified based on [Webler et al., 2009](#) “normally a ration of Q-Participants and Q-Statements is 3: 1 and the highest ratio that should be used is 2: 1”. Since herein we will include about 40 statements/Q-sort, we end up interviewing 20 participants.

Table 3.1 summarises statements with corresponding sources and methods of collection. The full list of statements is shown in Annex 1.

**Table 3. 1 Statements found in research steps 1& 2 by source**

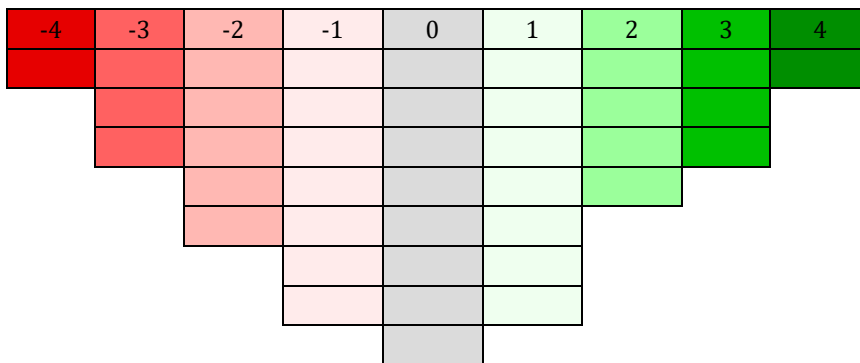
	Statement #	Source type	Method
RQ1	1,6	Media	Desk review
	2, 4, 7, 9, 10, 11, 15, 18, 19, 24, 26, 27	Scientific literature	Desk review
	3, 14, 16, 17, 20, 23, 25, 29	Reports/Briefs	Desk review
	12, 13, 21, 22, 28, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40	Participants	Interview
	5,8	Portal	Desk review
RQ2	45, 49, 53, 73	Media	Desk review
	50, 57, 60, 63, 64, 67, 68, 71	Scientific literature	Desk review
	42, 44, 48, 54, 55, 58, 59, 62, 72	Reports/Briefs	Desk review
	46, 47, 51, 52, 61, 65, 66, 70, 74, 75, 76, 77, 78, 79, 80	Interview	Interview
	41, 43, 56, 69	Portal	Desk review
RQ3	99, 100, 107	Media	Desk review
	89, 91, 113	Scientific literature	Desk review
	81, 82, 90, 92, 93, 95, 99, 101, 103, 104, 105, 108, 111	Reports/Briefs	Desk review
	83, 84, 85, 87, 88, 96, 100, 102, 106, 107, 109, 110, 112, 114, 115, 116, 117, 118, 119, 120	Participants	Interview
	86	Portal	Desk review
RQ4	160	Media	Desk review
	122, 123, 124, 142, 143	Scientific literature	Desk review
	121, 125, 126, 128, 130, 131, 133, 134, 137, 138, 139, 140, 141, 144, 145, 146, 153	Reports/Briefs	Desk review
	127, 129, 132, 148, 149, 150, 151, 152, 154, 155, 156, 157, 158, 159	Participants	Interview
	135, 136, 147	Portal	Desk review

### 3.3.2.2 Step 3: Individual Q-sorts

Based on the developed concourse, individual Q-sorts were performed using two main methods: online Q-sorting (using Q-sortware platform) and conventional Q-sorting in direct, face-to-face meetings. In both cases, participants (the P-set) were introduced with the method and guided how to perform each step of the methodology. The detailed instruction is provided in Annex 2. In case of online sorting using the Q-sortware, a

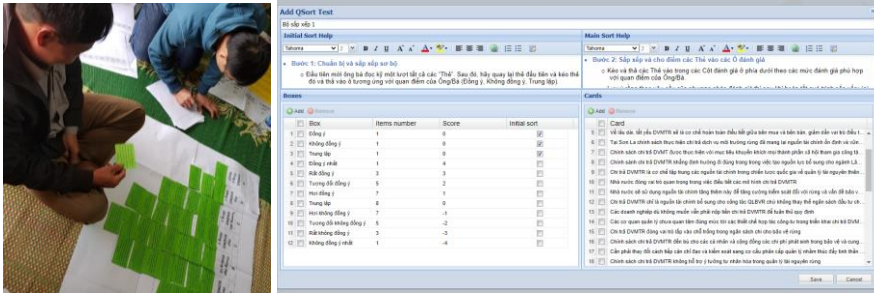
procedure was created by the research team and invitations (with a link to do Q-sorting) were sent to participants' email address. Then the research team facilitated the process through video calls, while data (Q-sort results) was stored on the Q-sortware' website and downloaded as excel spreadsheets. We obtained 17 Q-sort sets from 20 interviewees as three of them declined to perform the Q-sort.

Each participant was asked to distribute statements into the Q grid, based on their preferences. The ranking process is similar to the Likert scale format. The Q-sort design is shaped like an inverted pyramid and applying forced distribution and using quasi-normal distribution (Figure 3.3). The process included asking participants about their "strongest" opinions and challenges in placing cards, especially those that took them a lot of time to decide. It is to explore and obtain a deeper understanding of the Q-sort profile. Participants were asked to explain the reasons behind the placements of the cards on the grid. They were also prompted to express their opinions and feelings when they were doing the Q-sort.



**Figure 3. 3** The Q-sort table (Q-grid) containing 40 cells corresponding to the number of statements in each Q-sort

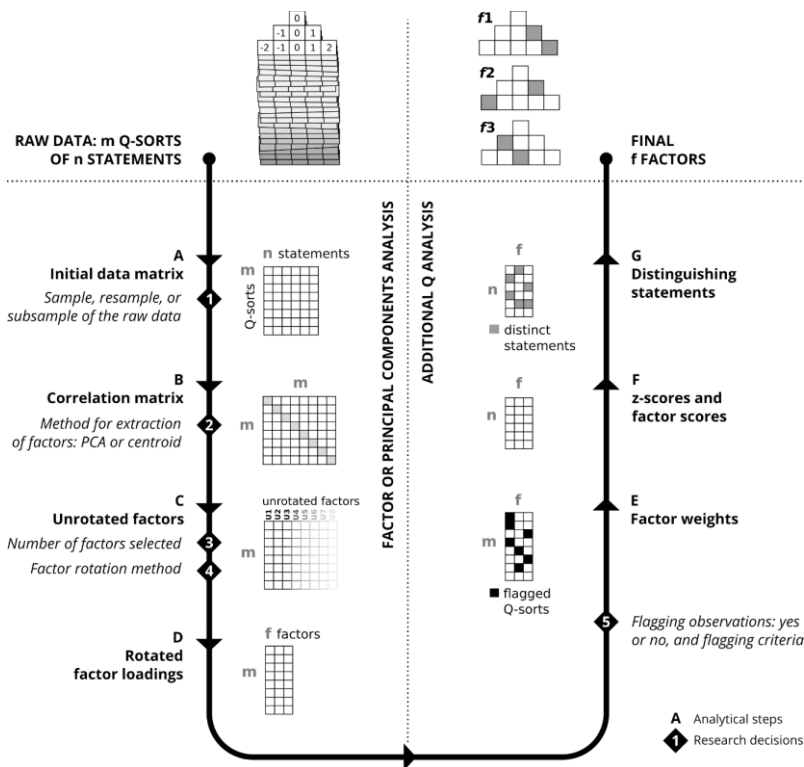




**Figure 3. 4 Individual Q-sort: face-to-face (left) and online screenshot (right)**

### 3.3.2.3 Step 4: Quantitative and Qualitative analysis

We applied the standard approach in Q analytical process as suggested by Zabala & Pascual (2016) (Figure 3.5). The KADE (KenQ Analysis Desktop Edition version 1.1.0) software will be used to build the correlation matrix, perform the principal component analysis (PCA), and flag the defining sorts. Each Q sort is correlated with every other Q sort in the analysis. The inter-correlation matrix is then factor analysed. Subsequently, significant factors are extracted and rotated. Each Q-factor is the average perception of respondents with similar views. Choosing how many factors to keep for rotation was (subjectively and objectively) based on how many factors are significantly distinct. A factor array or model Q-sort will be generated for each factor, with factor scores that are compared in arriving at distinguishing Q sample items. The distinguishing Q statements are identified, and the factors are interpreted contextually (qualitative analysis). Each factor represents a unique viewpoint out of the research topic.



**Figure 3. 5** The standard analytical process in Q methodology (Source: Zabala & Pascual, 2016)

### 3.3 Results

#### 3.3.1 Principal Component Analysis and factor loading

A total of 17 responses for each Q-sort were received (7 conventional responses and 10 online responses). Data was successfully loaded into KADE v1.2.0 software. The PCA was performed, and then its results were rotated by using a varimax rotation which is usually considered the best rotation method for producing simple structure (Ramlo, 2016). The result of PCA is a group of factors – in this case 8 factors by the software’s default. Statistically, factors (perspectives) whose eigenvalues are higher than 1 should be taken into account (Brown, 1980; Watts & Stenner, 2012). The factors should also explain as much variance and as many Q-Sorts as possible (Watts and Stenner, 2009) – for social studies, it is acceptable to have between 50-60% of total variance (Rahma et al., 2020).

However, Q methodology is more about theoretical than statistical considerations (Stephenson 1953, Ramlo 2016), and in defining Q-factor logical distinctions is less important than the representativeness of a snapshot of perspectives (Brown, 1993). As such, there is no standard number of factors to use --- any number of factors can describe how Q-Sorters think, feel or perceive certain subjects. In the search for variety of viewpoints and in addition to Eigen values, we used the following criteria that has been suggested earlier by Watts & Stenner (2005), Webler et al. (2009) and Damio (2018), namely (1) Simplicity – the less number of factors often makes the more explicit and straightforward viewpoints; (2) Clarity - the factor which each sorter loaded highly on; (3) Distinctness - reduced correlations between factors are better, and (4) Stability - certain respondents tend to be grouped together in factor loading. Application of these criteria led to the identification of 3 'discourses' (or perception types) per each set of Q-sorts (Table 3.2). These "three discourse" solutions explained 42 – 53% of total variance of the Q-sorts and ensured that each factor had at least 3 loaders --- a "rule of thumb" number suggested by many authors including MacCallum et al. (1999) and Raubenheimer (2004), although it should be noted that some studies found in literature contain only two or even one item per factor. These selections also had the lowest of consensus statements among factors. The selected factors were then passed to the data interpretation stage.

**Table 3.2** PCA and factor loading results

	Eigenvalues	% Explained Variance	Cumulative % Explained Variance	Number of loaders	Taken for qualitative interpretation (*)
<b>1<sup>st</sup> Q-sort set (Research Question 1)</b>					
Factor 1	5.10	30	30	6	*
Factor 2	1.76	10	40	5	*
Factor 3	1.56	9	49	2	
Factor 4	1.43	8	57	3	*
<b>2<sup>nd</sup> Q-sort set (Research Question 2)</b>					
Factor 1	5.28	31	31	7	*
Factor 2	2.37	14	45	6	*
Factor 3	1.56	9	53	3	*
<b>3<sup>rd</sup> Q-sort set (Research Question 3)</b>					
Factor 1	3.84	23	23	4	*
Factor 2	2.25	13	36	2	
Factor 3	1.69	10	46	3	*
Factor 4	1.60	9	55	3	*
<b>4<sup>th</sup> Q-sort set (Research Question 4)</b>					
Factor 1	4.66	27	27	5	*
Factor 2	1.99	12	39	3	*
Factor 3	1.55	9	48	3	*
Factor 4	1.45	9	57	2	

The interpretation of factors includes comparison of statement scores across groups of respondents with similar opinions (factors). Particular attention is given to those distinguished statements (that distinguish between factors) and to those that receive extreme Z-scores (at either end of the sorting continuum) (see 3.2. Data interpretation). The Z-score (continuous) is a weighted average of the values that the Q-sorts most closely related to the factor give to a statement--- it indicates the relationship between statement and factor: how much each factor agrees with a statement (Zabala & Pascual, 2016). To pin down differences and similarities between factors, the Z-scores for each statement were compared across factors. A statement was considered a distinguishing statement if the above comparison was statistically significant ( $P < 0.05$ ). A distinguished statement is the one that is only relevant and distinctively positioned in

the correspondent factor (discourse). If the comparison was not statistically significant ( $P > 0.05$ ), the statement was considered a consensus statement (positioned similarly across factors and thus shared by all discourses rather than belonged to any specific discourse (factor)) (Zabala & Pascual, 2016).

Factor loading also results in arrangements that form the composite statement array (also referred to as composite *Q-sort*) for each factor. Accordingly, composite statement scores are transformed back into the “integer number” scores used in the original sorting process. The composite *Q-sort* represents “*how a hypothetical respondent with 100% loading on that factor would have ordered all the statements of the Q-set*” (van Exel & de Graaf, 2005). One example of composite *Q-sort* is given in Annex 3.

### 3.3.2 Data interpretation

#### 3.3.2.1 First *Q-sort* set: How is PFES perceived by its stakeholders?

##### Discourse 1: A further step of socialisation in the forestry sector [Forestry socialisation]

This view is somewhat a “traditional” perspective in the forestry sector in Vietnam: all financial sources of the forestry sector are either state-owned or state-controlled, whether the money come from private sector, international donor or state-budget. According to this perspective, PFES was just a “larger” funding source compared to previous forestry programmes/policies (S30); the state did not step down from the payer role, and non-state actors play insignificant role as they just simply comply with Government’s request to transfer money to a state-owned trusted fund in exchange for their consumption of natural resources, in this case interpreted as forest environmental services (S2). The FES users were supposed to be well informed about PFES (S28), but that’s not relevant to how they are involved in decision making. Table 3.3 shows distinguished statements of this group in more details. Stakeholders who shared this

view did not express their opinion strongly, as excepted for statement 7 “*PFES policy implementation is a further step towards forestry socialisation*”<sup>12</sup>, they only sorted their viewpoint cards as “fairly agreed” or “fairly disagreed”.

**Table 3.3 Distinguished statements of discourse 1 (RQ1)**

State. No.	Statement	Q-sort value	Z-score	Sig.
7	PFES policy implementation is a further step towards forestry socialisation	3	1.9	
13	Private sector provides payments to comply with Government request	2	1.26	*
30	The most significant differences of PFES to previous forest protection policies are that it covers larger forest areas and financial flow is much more stable and predictable	2	0.8	
9	PFES is a mechanism to encourage the incorporation of financial incentives as part of the government strategy regarding natural resource management	0	-0.21	
2	PFES schemes help to shift the budget burden for forest protection from state to non-state actors	-1	-0.56	*
28	ES users (hydropower and water supply companies) are very rarely informed about PFES	-2	-1.31	*

Note: (\*) significance at  $p < 0.01$ ;

### **Discourse 2: Government should take control as for now [Government control]**

This view reflects the lack of trust on private sector’s involvement in PFES and thus presume the Government’s dominant role. While this group of stakeholders recognized the important of PFES in providing sustainable funding for forestry sector in Son La (S6), they denied the linkages between service suppliers and service users (S4) and the need for direct negotiation between these two groups (S24). On one hand, they did not trust private sector’s good will of forest protection (S22); on the other hand, they denied that by implementing PFES, the state is trying to hold and expand their power over forest

<sup>12</sup> “Forestry socialization” in Vietnam implies mobilization of social sources for forest protection and development, allocating forest land tenure to (non-state) stakeholders, and make use of market-mechanism in forestry sector (Vu & Vu, 2011)

management (S11) (Table 3.4). This discourse is perhaps most representatively summarised by a respondent working at PFES Fund in Son La province who said in the post Q-sort interview that *“direct payment is not appropriate here (in Vietnam) because ultimately it is needed to have someone from the local government to collect PFES revenue and check on the compliance of parties.....to ensure that forest is protected and local communities are duly paid for their efforts”*.

**Table 3. 4 Distinguished statements of discourse 2 (RQ1)**

State. No.	Statement	Q-sort value	Z-score	Sig.
6	PFES revenue is relatively new but has become an important and sustainable financial source for forestry sector in Son La province	4	2.87	*
11	The state would use additional (financial) resources to gain greater control in forest and watershed management	-1	-0.72	*
4	PFES has created economic linkages between providers and users of forest environmental services	-1	-0.81	*
22	Companies pay (to PFES fund) because they think it is good for the forest	-2	-0.98	
24	Building mechanism to support direct negotiation among service users and service suppliers is needed	-2	-0.98	

Note: (\*) significance at  $p < 0.01$ ;

### Discourse 3: Transforming to a more neoliberal scheme is needed [Towards neoliberalism]

In contrast to discourse 2, this group of stakeholders is among the most pro-neoliberalism individuals in the P-set. They strongly agreed that the mechanism for negotiation between FES users and suppliers (that is currently lacking in PFES) needs to be established (S24). They also urged for reinforcing relationship between PFES fund (state-owned) and the private sector (S34), and that companies (private) sector engaged in PFES not only as an obligation but also as a result of positive awareness of forest protection (S22). They disagreed strongly that the obligatory payment should be expanded (S38), but rather supported the idea to create economic linkages between

buyers and sellers (S4). Interestingly, they associated PFES with the idea of privatisation (S18), a novel yet debatable idea in discussions on neoliberalism. This could be considered an extreme discourse in the political-economic context of Vietnam where “people ownership” of forest, land and natural resources has long been constitutionalised. By this lens, they recognized that PFES was not compensating for forgone opportunity as a neoliberalism PES scheme would require (S16) (Table 3.5). It should be noted that this group of stakeholders was not completely negative on the state-owned PFES as the state has used PFES to further decentralise forest management in Son La (S33) and plays important role in regulating PES scheme in general (S10).

**Table 3.5 Distinguished statements of discourse 3 (RQ1)**

State. No.	Statement	Q-sort value	Z-score	Sig.
22	Companies pay (to PFES fund) because they think it is good for the forest	3	1.88	*
24	Building mechanism to support direct negotiation among service users and service suppliers is needed	3	1.48	*
34	The Son La Forest Protection and Development needs to enhance its connection with private sectors to further support local communities	3	1.2	*
10	The state plays an important role in regulating PES schemes	0	0.06	*
19	PFES payments derived may provide a strong incentive for state entities to hold on to the land, capturing the benefit streams associated with PES	-1	-0.77	
18	The implementation of PFES programmes has little to do with the idea of privatisation	-2	-1.23	
38	Payment obligation should be expanded to all people in the society as they all enjoy benefit from forest	-3	-1.42	*
16	The PFES programme creates incentives for individuals and communities to protect environmental services by compensating them for any costs incurred in managing and providing those services	-3	-1.43	*
33	PFES has done nothing to decentralisation of forest management in Son La	-4	-1.79	

Note: (\*) significance at  $p < 0.01$ ;

### Consensus statements:

There are also consensus statements among these three discourses as shown in Table 3.6. Stakeholders have somewhat agreed that PFES funding is gradually substituting state budget for forest protection (+), Government's success discourses are used to



expand state power in controlling forest resources (+), and disagreed that PFES revenue is managed as state budget (-).

**Table 3. 6 Consensus statements of the first Q-sort set**

State. No.	Statement	Factor 1 Z-score	Factor 2 Z-score	Factor 3 Z-score
12	PFES is designated as a supplementary source to State forest management budget but in reality it has been gradually substituting the State budget	0.56	0.571	0.331
25	PFES revenue is sometimes mistakenly seen as a part of State budget and managed accordingly	-0.2	-0.94	-0.694
26	Government discourse on the success of PES has served as an effective vehicle to expand state power in relation to forest resources	0.47	0.964	1.15

### 3.3.2.2. Second Q-sort set: how has PFES performed in Son La province?

#### Discourse 1: PFES has performed well in most aspects [Great performance]

According to Table 3.7, stakeholders who shared this discourse greatly appreciated PFES's success in improving local livelihood (S3) and poverty eradication (S18), and to some lesser extent the reduction of forest law violation in the province (S5). They strongly disagreed that either PFES is not helpful in poverty eradication or credible data proving positive impacts of PFES on local income is lacking. This is also the only group of stakeholders who were confident on the statements that PFES actually help to protect forest, e.g. reducing expansion of agriculture land into forests (S11); reducing slash and burn practices (S7), and increasing forest cover in Son La (S13). In other words, this discourse represents an applause for PFES performance in both livelihood improvement and forest protection – the two ultimate targets announced by the policy document.

**Table 3. 7 Distinguished statements of discourse 1 (RQ2)**

State. No.	Statement	Q-sort value	Z-score	Sig.
3	The participation of households in PFES for improving their livelihoods and contributing to the poverty reduction is a big success of the PFES policy implementation in Son La	4	1.73	*
13	PFES has helped to increase forest cover in Son La significantly	3	1.68	*
5	PFES has helped to reduce both number and magnitude of forest law violence in Son La province	3	1.59	*
11	PFES helps to reduce agricultural cultivation on forest land	2	1.48	*
33	PFES payment has significantly contributed to local income, particularly in remote areas	2	1.34	*
7	Slash and burn practices have been reduced since PFES implementation	2	1.32	*
35	PFES helps local farmers in Son La to reduce their financial responsibility for other local development programmes	1	0.65	*
26	PFES payment should be concentrated in some hot spots of deforestation to be more effective	1	0.56	*
14	At a province level, PFES has not been proven effective in reducing deforestation	0	-0.28	*
29	PFES revenue has helped state owned Forest Enterprises (SFES) in Son La to revive their activities	0	-0.3	
6	PFES revenue has been higher than state budget investment for forest protection in Son La	-1	-0.57	*
24	PFES policy has not created enough incentive to forest owners to invest in reforestation	-1	-0.7	*
22	The effectiveness and efficiency of PFES in the aspects of environmental and social performance of have not yet been proven due to lack of an independent monitoring, reporting and verification system	-2	-0.9	*
12	PFES payment could encourage some communities to plant forest if combined with other in-kind payments	-2	-0.91	*
30	A large number of forest owners (43,000) greatly increases transaction costs of PFES in Son La	-2	-1.04	*
32	Credible data showing PFES as having a positive impact on local incomes is lacking	-2	-1.24	*
18	PFES is not much helpful for poor household to escape from poverty	-3	-1.51	*

Note: (\*) significance at  $p < 0.01$ ;

**Discourse 2: Communities' awareness and commitment have been improved****[Improved awareness]**

This perspective highly valued impacts on local communities' management and awareness of forest protection. The Q-participants associated with this perspective emphasized that PFES implementation has effectively changed local people forest management (S10) and villagers' commitment to PFES has been increasing since its implementation in Son La (S4), and they considered enhancing forest stakeholders' awareness and responsibility for forest protection is the most important achievement of PFES in Son La (S40). These participants seemed to have faith in PFES's positive impacts in protecting forest (S7, S14, S28, S34) but acknowledged the lack of data to prove those impacts (S15, S32). Unlike Q-participants of Discourse 1, they did not think that PFES was helpful in poverty eradication (S16), and stayed neutral in comparing performance of PFES and other poverty reduction programme (S36). However, they did see that PFES have contributed to reduce financial burden of local communities in infrastructure development and in contributing to other development programmes (S35, S38). This concurred with the fact that many communities in Son La used PFES payment to develop small-scale rural infrastructure for their villages and communes (Interviewed participants confirmed by a number of reports of Son La's Forest Protection and Development Fund). This viewpoint is summarised in [Table 3.8](#).

**Table 3.8 Distinguished statements of discourse 2 (RQ2)**

State. No.	Statement	Q-sort value	Z-score	Sig.
10	The PFES programme there effectively changes local people forest management	4	2.14	*
35	PFES helps local farmers in Son La to reduce their financial responsibility for other local development programmes	3	2.09	*
38	PFES has helped communities in Son La to develop local infrastructure	3	1.72	*
4	Villagers commitment to PFES has been increasing since its implementation in Son La	3	1.57	*
40	The most important achievement of PFES in Son La is that forest holders awareness and responsibility for forest protection has been enhanced	2	0.86	*
7	Slash and burn practices have been reduced since PFES implementation	1	0.41	*
32	Credible data showing PFES as having a positive impact on local incomes is lacking	1	0.3	*
22	The effectiveness and efficiency of PFES in the aspects of environmental and social performance of have not yet been proven due to lack of an independent monitoring, reporting and verification system	0	0.24	*
36	PFES is less effective than other programmes such as 30A in terms of poverty alleviation	0	0.1	
12	PFES payment could encourage some communities to plant forest if combined with other in-kind payments	0	-0.1	*
15	Forest quality of PFES villages is improved compared to non PFES villages	-1	-0.6	
28	PFES is likely to be unable to tackle several of the key underlying causes for deforestation and forest degradation, namely, uneven land tenure and a lack of participation by local communities in conservation	-2	-0.94	
16	PFES has contributed to poverty eradication in Son La	-2	-1.09	
31	The PFES management accounting system lacks transparency, and data on incomes and expenses have not been made publicly available.	-2	-1.17	*
14	At a province level, PFES has not been proven effective in reducing deforestation	-3	-1.77	*
34	Although Son La aims to increase its forest cover annually, PFES results showed the opposite trend	-4	-2.31	*

Note: (\*) significance at  $p < 0.01$ ;

### Discourse 3: Poor effectiveness and inappropriate institutional structure [*Poor performance*]

The Q-participants of this discourse were most critical of PFES' effectiveness and performance in Son La (Table 3.9). Quite opposite to stakeholders of Discourse 1, they strongly disagreed that PFES has been able to mobilise more active participation (than previous forestry programmes such as 661) of local farmers (S25). This was partly due to the fragmented forest land holding in Son La (S17). This is, however, related more to economic impacts and transactions costs than to the structural issues of PFES itself, for example the flat-rate payment that did not differentiate performance of forest holders. According to these Q participants, while data proving PFES effectiveness was not available (S22 and S32), PFES neither reduce slash and burn practices threatening the forest (S7) nor reduce financial burden of local communities contributing to other development programmes (S35). Similarly, it was not sufficient in reducing deforestation (S14). This was also extended to the social impacts: public understanding and support to PFES are still limited (S2). To address these issues, it is suggested that more appropriate and sustainable institutional options for PFES to be identified (S27).

**Table 3.9 Distinguished statements of discourse 3 (RQ2)**

State No.	Statement	Q-sort value	Z-score	Sig.
17	The average household forest landholding in Son La Province (about 2 ha) is too small to generate sufficient income to persuade farmers to conserve or expand the forested area	3	1.41	*
22	The effectiveness and efficiency of PFES in the aspects of environmental and social performance of have not yet been proven due to lack of an independent monitoring, reporting and verification system	2	1.38	*
27	To promote sustainable PFES in Son La, it is necessary to identify institutional options that reduce transaction costs and organisational problems	2	1.38	*
32	Credible data showing PFES as having a positive impact on local incomes is lacking	2	1.21	*
12	PFES payment could encourage some communities to plant forest if combined with other in-kind payments	2	0.99	*
14	At a province level, PFES has not been proven effective in reducing deforestation	1	0.73	*
2	Public understanding and support to PFES are still limited	1	0.62	*
35	PFES helps local farmers in Son La to reduce their financial responsibility for other local development programmes	-2	-0.96	*
37	It is possible that a part of PFES fund is lost through the long payment procedure	-2	-1.09	
7	Slash and burn practices have been reduced since PFES implementation	-3	-1.25	*
25	Local people have more actively participate in PFES than previous forestry programmes such as 661	-4	-1.66	*

Note: (\*) significance at  $p < 0.01$ ;

### Consensus statements

Consensus statements for the 2<sup>nd</sup> Q-sort set is summarised in [Table 3.10](#). Despite different assessments on PFES effectiveness, stakeholders commonly agree (+) that social acceptance of PFES is rather high (S1), and at some extent PFES did help to reduce forest fires in Son La (S9). Stakeholders also disagreed (-) that only a small number of households who hold forest tenure is benefiting from PFES (S23) and that PFES is causing local social conflicts (S20) -- this somehow matches with forest tenure status in

Son La where most production forests were allocated to households and community forest management structures were well used in PFES payment.

**Table 3. 10** Consensus statements of the second Q-sort set

State. No.	Statement	Factor 1 Z-score	Factor 2 Z-score	Factor 3 Z-score
1	In general, the acceptance of society to PFES is rather high	1.35	1.219	1.845
9	PFES has helped to reduce the number of forest fire cases in Son La	0.99	0.38	0.478
19	In some places, environmental targets of PFES have been diminished in exchange for local social targets	-0.608	-0.296	-0.209
20	PFES policy does not have a significant contribution to forest protection, but even increases social conflicts in the local community	-1.466	-1.015	-1.636
23	Only about a small number of village households gained access to PFES benefits, whereas ones who only held unrecognized customary tenure without a contract were excluded from benefits	-1.751	-1.465	-1.621
28	PFES is likely to be unable to tackle several of the key underlying causes for deforestation and forest degradation, namely, uneven land tenure and a lack of participation by local communities in conservation	-0.28	-0.94	-0.2
29	PPFES revenue has helped state owned forest enterprises (SFEs) in Son La to revive their activities	-0.3	-0.96	-0.99
39	Flat rate payment to all forest-owners is not effective to protect forest	-0.5	-0.26	-0.927

### 3.3.2.3 Third Q-sort set: how has PFES blended with other policies in Son La province?

Discourse 1: PFES has been very well integrated in forest governance policies and structures [Integration throughout]

The Q-participants of this discourse were very positive about the level of integration of PFES into the current policy and institutional structure of forest management in Son La province (Table 3.11). They disagreed strongly with statements implied that PFES were not well integrated into forestry sector planning in general (S36) and commune level's planning (S14, S15). They found that PFES have been very well integrated into village regulations (S37) and especially support implementation of community forestry policy in Son La province (S35). Regarding institutional structure, the perception was neutral on how PFES helped to re-arrange forest-ownership in Son La to facilitate PFES implementation (S40) as well as the risk of ignoring local conditions in implementing a nation-wide policy. Regarding institutional structure, the Q-participants only slightly worried about the lack of grievance handling system to address PFES complaints (S13).

**Table 3. 11 Distinguished statements of discourse 1 (RQ3)**

State. No.	Statement	Q-sort value	Z-score	Sig.
35	PFES payment has strongly support community forestry policy in Son La	4	1.9	
37	PFES is now included in villages regulations	3	1.41	*
13	The lack of a formal channel for submitting claims and grievances (of PFES) serves to reinforce inequity among stakeholders	1	0.24	
1	There is a risk of application of a simple top-down approach, in which the national legislature steers PFES without taking the differences between local contexts (of Son La) into consideration	0	0.23	
40	PFES offers an opportunity to re-arrange forest ownership in Son La (from households to communities) for better management	0	0.19	
36	Forestry sector plan of Son La has included PFES, but only by a few ambiguous sentences	-2	-1.42	
15	In many cases, PFES did not get adequate attention and was not integrated well into communes' socio-economic development plan	-2	-1.47	*
14	Engagement of Commune People Committees in implementing and monitoring PFES is very low	-3	-1.51	*

Note: (\*) significance at  $p < 0.01$ ;



**Discourse 2: No integration except at village level [No integration]**

This discourse contains several thoughts that almost starkly contrasted with Discourse 1 (Table 3.12). According to Q-participants of this discourse, PFES was not at all integrated in planning (S4) and it did not help to re-arrange complex forest ownership in Son La (S40). The “good” performance of PFES in forest protection was actually based on a strong and effective forest law enforcement (S9), not the other way around. In the post Q-sort interview, a Q-participant who was a local forest ranger in Son La said “*PFES is a success but that’s mostly because forest encroachment has already been stopped by forest law enforcement: the small payment from PFES would mean next then nothing (to local people) if the forest protection forces were not there (to protect the forests) --- forest was well protected even before PFES started to be implemented*”. In this sense, PFES acted like “lubricant” that helped to smoothen relationship between local communities and authorities, making it easier to implement other policies in the same location (S5). But again, PFES was not seriously considered in planning for government policies (partly because the money did not come from State budget), except at village level (S37) that is indeed not an unit in the government’s administration system.

**Table 3. 12 Distinguished statements of discourse 2 (RQ3)**

State No.	Statement	Q-sort value	Z-score	Sig.
9	PFES builds on a well-implemented forest law that effectively blocks forest conversion	4	1.8	*
5	PFES payment helps to build consensus of local communities in implementing other policies in the same location	3	1.45	
4	PFES is not integrated into local planning at all	2	1.03	*
37	PFES is now included in villages regulations	1	0.32	*
1	There is a risk of application of a simple top-down approach, in which the national legislature steers PFES without taking the differences between local contexts (of Son La) into consideration	-1	-0.65	
40	PFES offers an opportunity to re-arrange forest ownership in Son La (from households to communities) for better management	-4	-2.11	*

Note: (\*) significance at  $p < 0.01$ ;

### Discourse 3: Institutional improvements (of PFES) needed [Institutional improvement]

As summarised in Table 3.13, this discourse recognizes the role of PFES as a financial source to help achieve targets of other relevant policies/programmes in the province such as the Provincial REDD+ Action Plan (PRAP) (S10), and local government can count it into planning without worries that the state's budget allocated for forestry sector will be cut to avoid overlaps (S34). In this sense, PFES is helpful for local authorities to claim many forestry targets as many forestry policies and plans were promulgated without indication of associated funding sources from central state's budget, for example the PRAP of many provinces. However, apart from this financial aspect, the Q-participants of this discourse found that PFES was not well integrated into socio-economic development plan at commune level (S15); and from an institutional aspect there were some design/implementation flops (S24) and the organisational structure of FPES should not be maintained as it is now (S39). They also agreed that PFES offered chances to improve forest ownership in Son La that could lead to better management of the province's forest (S40). This was further discussed in the post Q-sort interview and it was found that the Q-participants perceived the statement (S40) more as "works" to be done in the future than a (partly) accomplished task.

**Table 3. 13 Distinguished statements of discourse 3 (RQ3)**

State. No.	Statement	Q-sort value	Z-score	Sig.
10	At province level, PFES revenue has been significantly contributing to implementation of provincial REDD+ action plan	3	1.31	*
15	In many cases, PFES did not get adequate attention and was not integrated well into communes' socio-economic development plan	2	1.24	*
40	PFES offers an opportunity to re-arrange forest ownership in Son La (from households to communities) for better management	2	1.04	
9	PFES builds on a well-implemented forest law that effectively blocks forest conversion	1	0.72	*
24	Forest Protection Station (FPS) role as focal point for PFES fund distribution to local households has threatened the objectiveness of forest protection reporting that is also done by FPS	1	0.66	
27	There is no guidance on how to use PFES revenue to develop capacity of staff involved in PFES	-2	-0.79	
34	If PFES is mainstreamed into local planning, State budget allocation for local forest protection will likely be cut	-3	-1.79	
39	The organisational structure of PFES should be maintained as it is now	-3	-2.03	*

Note: (\*) significance at  $p < 0.01$ ;

### Consensus statements

For this Q-sort set there was only one consensus statement (S25) *“Trust and accountability can be built through participatory development of a transparent monitoring and evaluation programme that is integrated into PFES”*. All stakeholders supported this statement (+), indicating that they wish for more stakeholder involvement in monitoring and evaluation of PFES to enhance accountability of the programme overall. Although this has an important implication on the future of PFES, it should be noted that the need for participatory and transparent PFES monitoring system was raised almost identically with the PFES operation, there has been not so much progress on this premise after more than 10 years of PFES implementation.

### 3.3.2.4 Forth Q-sort set: Is communities' participation a response to PFES incentives?

#### Discourse 1: Voluntary and well-informed participation [*Well-informed participation*]

This perspective indicates that communities' participation to PFES was based on their full understanding of PFES policies, implying that their participation is well informed and voluntary. In general, the Q-participants associated with this perspective denied statements of "major problems to PFES" while admitted that some "minor issues" needs to be addressed (Table 3.14). They disagreed that participation is induced by villages' rules compliance more strongly than by payment (S28). They also denied that there were inequalities in access PFES payment (S3) and that PFES did not reach to poorest households in the villages (S4) as reported in some existing literature (To et al., 2013). These participants declared that most of the households benefited from PFES are aware of the payment source (services users) (S13). However, they admitted that PFES awareness raising activities did not meet information needs from stakeholders (S11). Thus, they proposed more use of leaflets to enhance local awareness (S12) and reduce the difference in payment rates of different sub-watersheds (S36) (an issue that is locally perceived as "inequality"). They also proposed that PFES revenue should be spent more on collective benefits (social welfare and road development) than individual benefits (households) (S32). Overall, the discourse seemed well representing the existing "mainstream political viewpoints" on PFES in Vietnam: it is a good policy and well greeted and participated by the publics, although there are a few drawbacks to be addressed in the future.

**Table 3. 14 Distinguished statements of discourse 1 (RQ4)**

State. No.	Statement	Q-sort value	Z- score	Sig.
13	Most of the households benefited from PFES are aware of that this money is paid by the PFES users	3	1.48	
32	PFES revenue should be spent more on social welfare and road development than allocating to households	3	1.23	*
12	There is a need to use more leaflets to enhance local awareness	2	0.97	
36	Son La needs to be authorized to adjust payment rates among watersheds to reduce (large) difference in payment rates applied to different sub-watersheds	1	0.57	*
11	Awareness raising activities for PFES have not been developed based on actual information needs of relevant stakeholders	1	0.48	
34	Some households do not even bother receiving PFES payment as the payment rate was too low	-1	-0.16	
40	PFES has helped many households to secure their living by forest protection and maintenance	-1	-0.3	*
28	Local people protect forest as complying to their villages regulation rather than because they receive PFES payment	-3	-1.4	*
4	PES payments were not reaching the poorest households	-3	-1.57	
3	There is inequality in PFES participation, as only strong and young male villagers are selected for forest patrolling groups, and therefore these men are the main PFES beneficiaries	-4	-1.97	*

Note: (\*) significance at  $p < 0.01$

### **Discourse 2: Forest protection labour [Protection labor]**

In contrast to Discourse 1, the Q-participants of the Discourse 2 was seriously concerned by the current roles of local communities. Not only they believed PES payments were not reaching the poorest households (S4), they also did not see that individuals and communities were the most benefited groups in PFES implementation as they should

have been (S1). This was first related to the fact that most PFES agreements signed between large forest holders (state-owned) and households/communities could be seen as labour contracts (S6): individual households received PFES payment in exchange for their “labour cost” in forest patrolling (often once per two weeks) (this was referred to in the contract as household’s forest protection commitments). Secondly, households who “owned” forest lands (in Son La province, most households’ forest areas are under 2 hectares) and signed contracts with FPDF received much less payment compared to large holders (state-owned forest management boards or enterprises with thousands of hectares of forest), and that payment was not adequate to their efforts protecting forests (S30). With these arguments, the Q-participants did not think that PFES payment is sufficient to motivate communities’ participation in forest protection and development (S15). In addition, information and awareness raising did not meet stakeholders’ needs (S11), leading to a question of whether local people’s participation was well informed. To address the above concerns, these participants strongly suggested empowering local people by involving them in PFES decision making and monitoring (S21) ([Table 3.15](#)).

**Table 3. 15 Distinguished statements of discourse 2 (RQ4)**

State. No.	Statement	Q-sort value	Z-score	Sig.
6	Local people should no longer be considered as low-cost laborers, but as equal partners and a driving force in forest protection	4	2.5	*
21	Participation of local people should be promoted through empowering local people to voice their views during decision-making and to monitor the PFES program	3	1.95	*
30	Smallholders are paid by PFES based on the size of actual forest they own, not by forest protection activity they perform	3	1.6	*
11	Awareness raising activities for PFES have not been developed based on actual information needs of relevant stakeholders	2	1.25	
4	PES payments were not reaching the poorest households	1	0.21	
2	PFES payments not only induced a higher motivation for forest management but also strengthened community capacities for forest protection	0	0.06	*
15	PFES payment is the key motivation for local communities participation in forest protection and development	-2	-1.13	*
1	Communities, household groups and individuals are enjoying the most benefit from PFES	-4	-1.61	*

Note: (\*) significance at  $p < 0.01$

### Discourse 3: PFES suppliers are fully incentivized by current cash payment

#### [Sufficient cash payment]

As summarised in Table 3.16, this discourse focuses on the notion that cash payment by PFES alone has been sufficient to trigger local participation. Accordingly, the Q-participants believed that PFES payment was attractive to local labors (S16), and that it could help many households to secure their living by forest protection activities (S3). They strongly disagreed that many poorest households in the communities did not receive PFES payment (S4), and that some households just simply skipped their opportunity to receive the ignorable payment amount (S34). This perspective is unique because the majority of literature and interviewed stakeholders consider PFES payment rate as very low (on average around USD 10/ha.year). The discourse also favoured information flows under PFES, indicating that households benefited from PFES are

aware of the payment source (S13) while disagreeing that many farmers could not differentiate PFES from other state support programmes (S19). The discourse only admitted one “weakness” of PFES information that most households did not know which forest protection activities they are required to comply with under PFES (S8). When put together with Discourse 1, this discourse can be considered a “complementary praise” of PFES (one for great information flows and one for great financial benefits).

**Table 3. 16 Distinguished statements of discourse 3 (RQ4)**

State. No.	Statement	Q-sort value	Z-score	Sig.
16	PFES policy provided attractions of forest protection activities to local labors, especially those in remoted areas	3	1.9	*
40	PFES has helped many households to secure their living by forest protection and maintenance	3	1.63	*
8	Most households did not know which forest protection activities they are required to comply with under PFES	2	1.16	*
13	Most of the households benefited from PFES are aware of that this money is paid by the PFES users	1	0.67	
12	There is a need to use more leaflets to enhance local awareness	0	0.18	
11	Awareness raising activities for PFES have not been developed based on actual information needs of relevant stakeholders	-1	-0.45	*
19	Many farmers can not differentiate PFES from other state support programmes	-2	-0.87	
34	Some households do not even bother receiving PFES payment as the payment rate was too low	-3	-1.21	*
4	PES payments were not reaching the poorest households	-4	-2.83	*

Note: (\*) significance at  $p < 0.01$

### Consensus statements

There are three consensus statements for the 4<sup>th</sup> Q-sort set as summarised in [Table 3.17](#).

All stakeholders disagreed that PFES payment is the only motivation for farmers' engagement in forest protection, that high payment rate may undermine farmers' motivation in continuing their production activities, and that availability of PFES



information only in the Kinh language (official Vietnamese language) incurred risks to low compliance of PFES contracts for ethnic minorities.

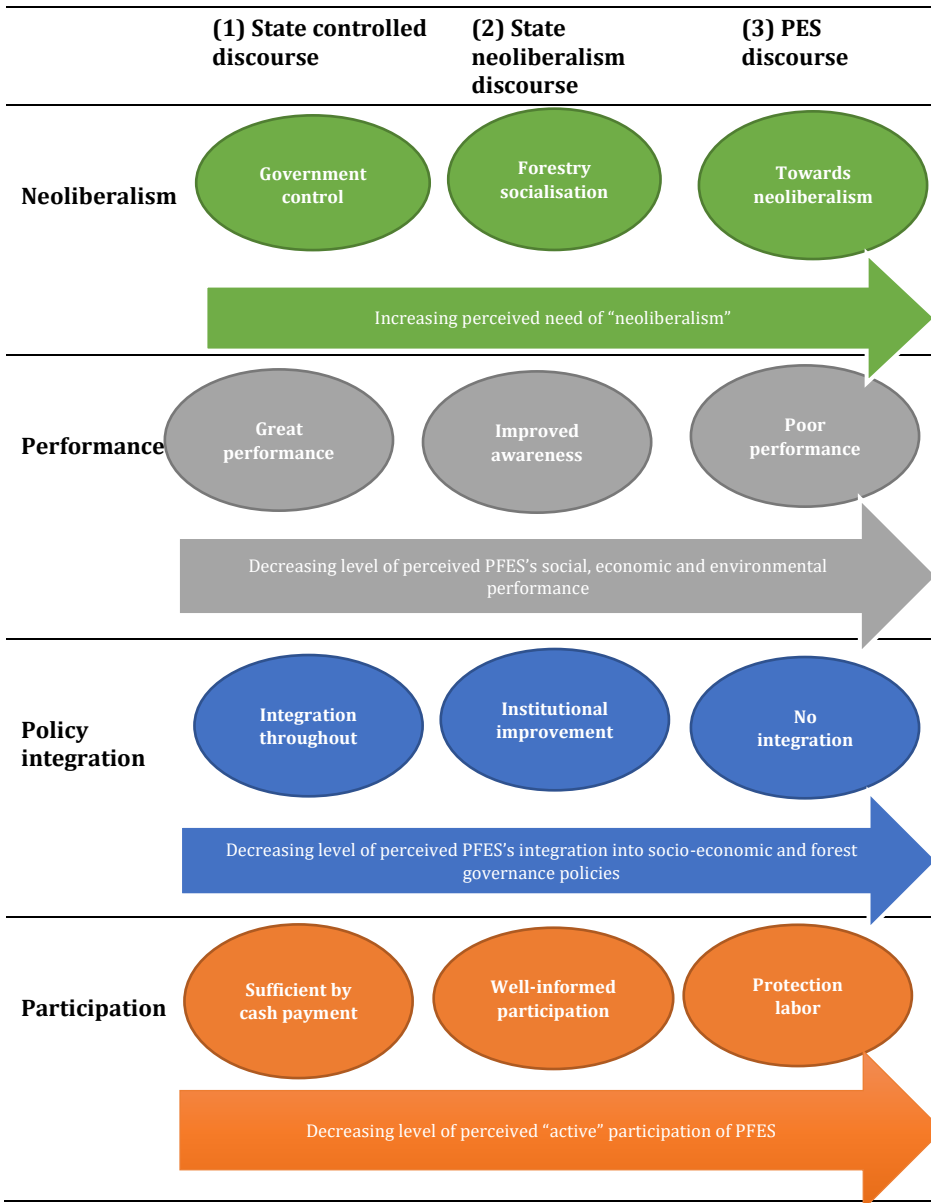
**Table 3. 17** Consensus statements of the second Q-sort set

State. No.	Statement	Factor 1 Z-score	Factor 2 Z-score	Factor 3 Z-score
20	PFES contractual and general information is only available in the Kinh language (the main language of largest ethnic population group in Vietnam) leading to a risk of misunderstanding for minority ethnic groups and a low compliance of PFES contracts	-1.08	-0.553	-0.23
29	No one would participate in forest protection without PFES payment	-1.148	-0.557	-0.694
38	If payment rate is too high it will make some local households become too dependent on FPES support and less active in involving in other economic activities	-1.134	-0.942	-0.482

### 3.3.2.5 Meta-discourses on PFES in Son La

The above 12 discourses can be organised into three meta-discourses (meta-discourse is *discourse about discourse* – such as related to PFES and forest governance in general that affect aspect-specific PFES discourses) (Pülzl et al., 2014; Hyland, 2017; Lei and Chan, 2018) as in Table 3.18. They are so called (1) state controlled discourse, (2) state neoliberalism discourse, and (3) PES discourse. Each meta-discourse encompasses viewpoints of 4 specific discourses on 4 PFES aspects, namely Neoliberalism, Performance, Integration, and Participation. The Government controlled discourse offers a very centralised approach where PFES is fully mediated and managed by government agencies, an arrangement that (according to the discourse) brought about great PFES performance and alignment with other socio-economic and environmental protection policies in the province and provides sufficient cash incentive for full participation of local farmers. On the opposite side, the Critical discourse conveys an idea towards neoliberalism, that is linking buyers and providers through a more market-

based approach, reducing Government's role and empowering local stakeholders (particularly communities) in PFES decision making – as the current PFES lacks transparency and accountability to prove the claimed successful implementation. The state neoliberalism discourse stands between Government controlled discourse and the Critical discourse: on one hand it affirms the need of strong government's role in PFES and the role of PFES in improving local stakeholders' awareness and attitude towards forest protection; on the other hand it reckons that PFES is a further step towards socialisation in forest governance and that some structural changes are needed to make PFES better aligned with forest protection and socio-economic development policies and more economically attractive to local communities. These meta discourses resemble a "transition" from "state-forestry" to "neoliberalisation" in forest governance perspectives in Son La province in particular and in Vietnam in general. At a higher level, they mirror (although not fully comparable to) the country's post communism economic transition where both market economy and dominance of state's actors are highly acknowledged. This will be discussed in more details in the following paragraphs.

**Table 3. 18** Summary of three meta-discourses identified in this study

## 3.4 Discussion

### 3.4.1. In transition: how PFES meta-discourses reflect past and present trends in Vietnam's forest governance

After reunification in 1975, Vietnam applied a centralised state management of forestry wherein all forest lands are directly owned by the state and state-owned forest enterprises are established and operated mainly with the purpose of forest exploitation (Dang et al., 2012; Wong et al., 2020). After a rapid forest loss and a crisis of centralised forest governance model that could no longer afford state-owned forest entities due to lack of funding and forests to exploit, Vietnam started to decentralise forest governance along with the country socio-economic reform (*Doi Moi*, in Vietnamese) - market economy was officially admitted and adopted and started to replace the state centralised economy in the whole country (Revilla Diez, 2016; Sadanandan Nambiar, 2021). With Forest Protection and Development Law 1991 and Land Law 1993 that allowed forest land allocation (FLA) to individual households, farmers can have land user rights over land and forests to plant forests on bare land and bare hills (Lee & Trinh, 2017). It should be noted that these laws were more focused on restricting than granting benefits that non-state land holders could get from forest (Wong et al., 2020). Since then, a new land law and a new forest protection and development law have been introduced in nearly a decade, with rights over forest and land have been further defined and provided to farmers and other non-state actors, reflecting transition of the country's economy and land and forest governance regimes. For example, the Law on Forest Protection and Development (1994) did not recognize communities as forest holders; the Law on Forest Protection and Development (2004) recognized communities as legal forest holders (despite some restrictions on use); and Forestry Law (2017) further acknowledged religious and customary forms of forest management.

As such, Vietnam has been emphasizing “forestry socialisation” (*xã hội hóa ngành lâm nghiệp*, in Vietnamese), i.e mobilizing finance from private sectors and social actor groups for forest protection and development as an important forest management strategy. PFES itself is well aligned with this course - considered one of the Vietnam forestry sector’s most successful forestry policies of the past decade mainly for its significant capital (22% of total forestry sector investment in 2018) collected from private sector (Pham et al., 2018b; Trieu et al., 2020; Pham et al., 2021). However, similar to the “flexible adjustment to neoliberalism” strategy that allows Vietnam and China to “keep commanding heights of their economies” (Bui, 2020), there are certain limits of openness of forest governance in Vietnam and the forestry sector must be operated in line with the political interest of the Communist party (Wong et al., 2020). Despite the fact that FLA in forestry sector has a history of more than 30-years, the state still directly “manages” about 58.7% of forest land in Vietnam (VNFOREST, 2017). All special use forest and protection forest, and a significant part of production forest with an average better quality (than those allocated to households and communities) are managed by state entities (mostly FMBs and SFES) (World Bank, 2019). Smallholders, communities, and private companies are allocated with mostly depleted forest/bare-land for forest plantation that requires capital investment (that Government cannot fully afford). In many cases, forest land recipients perceive it more as a political task than for their own benefits (Wong et al., 2020). In terms of management structure and power allocation, devolution in forestry sector in Vietnam has been progressing at a much slower pace than in other sectors like agriculture, and actual powers on forest management and rights over forest resources are largely retained at central government rather than devolved to local government (Vien & Thanh, 2017). In short, forest management “rights and responsibilities” can be shared with non-state stakeholders as the state either could

not hold on to it any longer or could see the clear economic and development benefits with minimal risks of losing state's dominance. As a result, two main "forest governance modes" exist: (i) state's total command-and-control where all powers and rights belong to state entities, and (ii) state's control with economic links to non-state stakeholders wherein private sectors, households and communities are asked to share "rights and duties" (mainly duties) in forest protection and development. The former was dominant until recently (in many protected areas and protection forests) while the latter is being promoted (often with support from donors) and decorated with discourses on "forestry socialisation", "sustainable forest management", "forest and climate change", "REDD+", "Techno-economic forestry sector", and "payment for forest environmental services" (Dang et al., 2012; De Jong et al., 2017). In reality, the "co-management" model for special use forests aiming at equalizing management power between special-use forest management boards and local communities was piloted and resulted in a "Vietnamese style co-management" – that is administrative co-management, but decision-making power is still retained by provincial government (KimDung et al., 2013). Many stakeholders have been urging for further devolution (Dang, 2020) and integration of neoliberalism elements to replace command-and-control measures in forest governance in general and in PFES in particular (To et al., 2013; Do et al., 2018; To & Dressler, 2019; Ngoc et al., 2021).

#### **3.4.1.1 State controlled meta-discourse – remnant of the old-socialism era that may revive with PFES**

Economic reform in Vietnam and other post communism societies has brought about enormous structural shifts in the whole economy and society, including forest governance, but values and beliefs from the past does not fade quickly and even tend to resistant to change (Inglehart & Baker, 2000; Jami & Kemmelmeier, 2020). State's full

control of forest governance is not debatable in the past, and no deep transformation is needed today. Accordingly, any problem is not the state governance of forests, but the lack of resources to invest in the sector (Petrova, 2014). The state-controlled discourse emphasizes the role of government agencies, and more broadly of state in drawing in new resources for forest protection – a prioritized mission set in Vietnam’s forest protection and development strategies for 2006-2020 and forestry sector’s strategy for 2021-2030. As such PFES is considered a policy tool to extract financial revenue from private sector to serve for state’s forest management regime. The new revenue generated through the PFES is considered a remarkable breakthrough (in Vietnamese – ‘đột phá’) of the forestry sector by senior policymakers (To & Dressler, 2019) and also by stakeholders in this study. It is the first ever policy of the forestry sector that brings in stable and significant non-state budget to revive many forest protection and management activities. This has been featured among the top ten “successes” of agriculture sector in 2010-2015 ‘*một trong 10 thành tựu nổi bật của ngành nông nghiệp giai đoạn 2010-2015*’ and used to depict Vietnam as one of the “pioneers” in Asia to set up a nation-wide PES mechanism (To and Dressler, 2019; Pham et al., 2021).

This rhetoric echoes interests of state entities in enhancing their reputation, credibility, and accountability as the “owner” of PFES and in managing Vietnam’s forests. It is not surprising that this discourse praises PFES performance in every aspect very similarly to the way Government’s led propaganda depict “success” of government’s policies. This perspective portrays a nearly perfect PFES, although some points either may not necessarily true or need much more evidence to back up: active participation of household, great contribution to poverty reduction, significant increase of forest cover, reduced forest law violations and forest fire, and full integration into current policies and forest governance institutions. It should be noted that by “integration” here it means

more that local government agencies are implementers of central policies rather than harmonizers of top-down targets and local interests. This discourse also denied most negative statements of PFES and the implication is clear – while this old school governance is working very well with additional income from PFES, it is not time for new ways of regulation to come in. Any improvement needed is to build state's capacity to exercise its control, administrative and technical functions in forest governance, rather than bringing in new stakeholders to fill the gaps. The discourse also leads to an interesting yet debatable arguments: do such neoliberalism policy instruments like REDD+ and PES obstruct or even reverse decentralisation of forest governance in developing countries (Phelps et al., 2010, Toni, 2011, Suhardiman et al., 2013; To and Dressler, 2019)? While the question is yet to be answered, the state-controlled meta-discourse may be seen not as simply as a “social memory” of the old-socialism time, but a possible come-back and dominance of perspectives of authoritarian state forest governance.

#### **3.4.1.2 State neoliberalism meta-discourse – a further step towards forestry socialisation?**

State neoliberalism discourse possibly emerged from the state controlled meta-discourse and evolved to include new perspectives and new non-state actors, including NGOs, civil society and economic actors. This process has been largely influenced by international donor aid programmes on forestry in Vietnam, notably those contributed to Trust Fund for Forest, including Finland, Netherlands, Sweden and Switzerland (Wong et al. 2020). State budget constraints also added pressure on the government to adopt alternative financing schemes from non-state actors. Community-based forest management, REDD+, forest certification, payment for ecosystem services and other initiatives request more “serious” engagement by local people, communities,



marginalised groups, and private sector. Many of these discourses integrate elements of “neoliberal governmentality” as they favour communities, civil society and economic actors, deregulation, market’s self-adjustment (Colombo & Porcu, 2014). It is feared that central managerial control over forest resources can be undermined (Nel, 2015). From the Government’s perspective, the main concern is not to have more shared vision and power in decision making, but to transfer burden (especially financial burden) to other stakeholders and legitimize its (dominant) role in conservation and forest governance. Thus, a neoliberal turn -- the state neoliberalism discourse.

By essence, the state neoliberalism meta-discourse is almost identical to forestry socialisation (In Vietnamese: *‘xã hội hóa ngành lâm nghiệp’*) discourse that has been promoted along with economic reform: it is not privatisation, but rather that the society must be more responsible than the state in providing necessary services (including forest protection) (McElwee, 2012; Pham et al., 2013). Statements of this meta-discourse clearly reflect this pathway: *“PFES policy implementation is a further step towards forestry socialisation”* (+), *“Private sector provides payments to comply with Government request”* (+), *“PFES is a mechanism to encourage the incorporation of financial incentives as part of the government strategy regarding natural resource management”* (+), *“PFES schemes help to shift the budget burden for forest protection from state to non-state actors”* (+), and *“ES users (hydropower and water supply companies) are very rarely informed about PFES”* (+). Evolved from state controlled meta-discourse, this meta-discourse acknowledge that the state cannot control the whole process and allow some limited participation and rights of non-stakeholders, although not comparable to the participatory rhetoric in policies (Wong et al., 2020). It also acknowledges that the current institutional and governance structure does not fully embed PFES policy *“In many cases, PFES did not get adequate attention and was not integrated well into*

*communes' socio-economic development plan*" (+) and even suggest changes to governance status-quo, that *"The organisational structure of PFES should be maintained as it is now"* (-) and *"PFES offers an opportunity to re-arrange forest ownership in Son La (from households to communities) for better management"* (+).

It is evidenced that this meta-discourse has been translated in to PFES implementation in practice as it can be found in the literature. McElwee et al. (2020) investigated PFES payment recipients in Vietnam and found that PFES did provide additional power to local household and communities in forest management (although not consistent), and some flexibility was allowed in tailoring locally appropriate FPES benefit distribution structures (Le et al., 2016; Loft et al., 2017; McElwee et al., 2020). Although some authors suggested such discourse reflects a hybrid governance form between state-controlled and beyond-the-state governance models (Nel, 2015; McElwee et al., 2020), we assume that the state-neoliberalism meta-discourse is not a hybrid, but either an evolvement of the state-controlled meta-discourse under pressure of financial constraints of forestry sector, donor influence activities, and overall socio-economic transformation of the country or a "distorted" neoliberalism adapting to the specific context of institutions, policies and resources of Vietnam. In our opinion, the earlier prevails.

#### **3.4.1.3 PES meta-discourse: a counterbalance to state-controlled meta-discourse?**

Unlike the previous meta-discourses, the critical meta-discourse does not go with a specific governance model, but rather reflects its stakeholders' critical viewpoints on the existing PFES governance and implementation models. It suggests that in general PFES is lacking a mechanism to help direct negotiation between buyers and sellers *"Building mechanism to support direct negotiation among service users and service suppliers is needed"* (+). More specially, the government's owned FPDF need to be more proactive in

linking with non-state actor *"The Son La Forest Protection and Development needs to enhance its connection with private sectors to further support local communities"* (+). The meta-discourse denied PFES "success" in forest protection as *"The effectiveness and efficiency of PFES in the aspects of environmental and social performance of have not yet been proven due to lack of an independent monitoring, reporting and verification system"* (+), *"Slash and burn practices have been reduced since PFES implementation"* (-), and *"At a province level, PFES has not been proven effective in reducing deforestation"* (+), in livelihood and income improvement as *"Credible data showing PFES as having a positive impact on local incomes is lacking"* (+) and *"PFES helps local farmers in Son La to reduce their financial responsibility for other local development programmes"* (-). Accordingly, PFES did not perform any better than previous state-own forest protection programmes as *"Local people have more actively participate in PFES than previous forestry programmes such as 661"* (-). It also denied that PFES payment is the key motivation to local households and communities to participate in PFES as claimed by the state controlled meta-discourse, as *"PFES payment is the key motivation for local communities' participation in forest protection and development"* (-) and *"Communities, household groups and individuals are enjoying the most benefit from PFES"* (-). In terms of policy integration, although PFES helped to smoothen the relationship between local communities and other policy implementation in the same location, it *"was not integrated into local planning at all"* (+). In short, this meta-discourse is on the opposite side of the state-controlled meta-discourse. However, these two discourses should not be perceived as mutually exclusive. In the discursive debates of PFES, they co-exist as "yin and yang", and one acts as counter balance to another.

The critical discourse also refers to movement towards greater transparency, decentralisation, openness and a further entry of private capital (Jami & Kemelmeir,

2020). Two distinguished statements for this meta-discourse is “*The implementation of PFES programmes has little to do with the idea of privatisation*” (-) and “*To promote sustainable PFES in Son La, it is necessary to identify institutional options that reduce transaction costs and organisational problems*” (+). At least these imply a request to restructure the power relationship between public and private sectors in PFES management. Whether or not such a transformation will actually occur is still a question. Taking experience of economic transformation and forestry governance in the country, it will likely pave a way to variegated neoliberalisation, similar to the formation of state neoliberalism, so that the forestry sector of Vietnam keeps its door open to external investments.

### **3.4.2 Implications to PFES debate in Vietnam**

This study is the first attempt to identify PFES discourses in Son La province, Vietnam using Q-methodology. It advances the research frontier in environmental discourse analysis by making visible the assumptions and beliefs that underlie the present debates and implementation of PFES in Son La and perhaps also valid for the whole Vietnam. The results demonstrate that there are two meta-discourses that are supportive of PFES and another that is more critical. Each of these meta-discourses reflects different assumptions and beliefs about the role of the Government and non-state stakeholders, PFES performance and its integration in pre-existing policies and institutions, and participants of smallholders in the province. Besides identifying meta-discourses of PFES in Son La, and highlighting their main commonalities and differences, this study can foster further exchanges and discussions over PFES in Vietnam.

The first consensus among meta-discourses is about the importance of PFES in mobilizing resources for the forestry sector. Despite all of its weaknesses and imperfections, PFES has helped the sector to revive its role and create new momentums in forest

protection activities that are otherwise very difficult to develop. The PFES policy was born at the critical moment when state's budget for the sector is depleted, and it certainly provides valuable experience in shaping-up policies that attract large-scale funding from private sector to forest management activities that were previously maintained through either subsidized schemes or donors' grants. The quick rise of PFES undeniably shows common interests of different stakeholders in searching for a new financing mechanism of forestry sector. However, levels of expectation on the "market-based" nature of this mechanism may vary between stakeholder groups. The Government claimed that "*PES policy has facilitated the construction of a market-based mechanism with the government's orientation... reflecting economic transactions... between service buyers... and sellers*" (VNFF, Briefing 4, 2016 as cited by To & Dressler, 2019), but for some scholars, there is possibility that PFES resembles some aspects of green grabbing – farmers to work on forest land to achieve state's targets in forest protection (Suhardiman et al., 2013). This relates to the second important consensus about how the Government will use PFES to gain more control over forests "*discourse on the success of PES has served as an effective vehicle to expand state power in relation to forest resources*". On this premise, stakeholders in our study concur with earlier notifications found in the literature (Suhardiman et al., 2013, To & Dressler, 2019; McElwee et al., 2020). This trend is somehow expected by stakeholders in policy development in "socialist market-economy" model of Vietnam and China, to "*ensure national ecological security, social stability and regionally coordinated development*" (Zhen & Zhang, 2011). It is interesting for future research to understand how non-state stakeholders will continue to influence PFES's vertical structure and add-in horizontal elements. The third important consensus was about social impacts of PFES implementation in Son La: PFES neither caused social conflicts nor differentiated access to payment based on their forest land

right status as has been warned by some authors (To et al, 2012; Le et al., 2016). The facts that Son La has a very high rate of forest land allocation to individual households and household groups – they are the largest forest holders in the province, and that Son La has largely utilised community structures for PFES fund disbursement (Thuy et al., 2020) might play an important role in minimising inequality and local conflicts as local norms of equity were duly considered (Loft et al., 2017). However, it should be acknowledged that the situation may be very different in some other provinces where land holding is uneven and labour contract is the most popular PFES benefit distribution mechanism.

The most noticeable divergence of PFES meta-discourses found in this study is on PFES performance, with implications to its effectiveness and efficiency. The state-controlled meta-discourse compliments PFES implementation in Son La that were effective environmentally (increased forest cover), economically (increased income and reduced poverty) and socially (increased local awareness and attitude towards forest protection) while we found very little evidence to support these claims, except for some social impacts and improved awareness that was partly achieved through campaign style propaganda program. The state neoliberalism meta-discourse was more modest: it took on the awareness raising impacts but admitted that there was no data to support “success” in raising farmers’ income and actual forest protection. In contrast, there are numerous findings and figures that back up critical meta-discourse on PFES performance, that there was a lack of a credible monitoring system to track “additionality” of PFES (Tran et al., 2016; Thuy et al., 2020), that PFES was not sufficient to address drivers of deforestation and could not help to increase forest cover (Thuy et al., 2020; Cochard et al. 2020), and that the overall contribution of PFES to total household income and poverty reduction is marginal (McElwee, 2012; World Bank,

2019; Duong & De Groot, 2020; Thuy et al., 2020). A simple solution to this issue would be to have an independent and reliable PFES monitoring and reporting system to keep tracks on key socio, economic and environmental indicators, ultimately make PFES “performance-based”. However, such a system may be a tall order for the current forest and PFES management regime: the non-neoliberal parts, the ambiguity and contradiction of PFES were intentionally designed (McElwee et al., 2020) and data collection for PFES performance is politicized to serve the control purpose of different governmental levels (Tran et al., 2016; Thuy et al., 2020).

Another worth discussing difference between the PFES meta-discourse is the motivation of local farmers to participate in PFES, or more simply whether or not PFES payment is economically sufficient to trigger farmers’ participation (a neoliberal argument). The state controlled discourse said that PFES payment is quite attractive to local labors in remote areas, and helped many households in to secure their living, while both state neoliberalism and critical meta-discourses indicated otherwise: *“Smallholders are paid by PFES based on the size of actual forest they own, not by forest protection activity they perform”* (+), *“PFES payment is the key motivation for local communities participation in forest protection and development”* (-). Interestingly, evidence from studies in Son La neither fully support nor reject both discourses for their claims: PFES has provided little additional income to individual households, but the total amount paid to village communities are often significant and helped communities a lot in developing a number of small-scale rural infrastructures (Thuy et al., 2020). In a way PFES in Son La did help to incentivize local communities for their engagement in forest protection. As mentioned above, this was largely contributed by the fact that many households and communities in Son La are legal forest holders. At national level, it was

found that PFES revenue concentrated on contracted forestland (for protection) (Cochard et al., 2020), thus a different story may be expected.

### 3.4.3 Limitations of the study

Studies of perceptions often have inherent limitations, and this study is not an exception. First, some respondents might be hesitant and tried to provide “neutral judgements” that are not necessarily reflect their inert opinions. Second, interpretation of factors involved a certain level of subjectivity, and researchers may also be biased by interactions with Q participants before and during the Q-sort. Third, different levels of awareness and knowledge among respondents about the issue (or a specific statement) would have implications for the extent to which the sorts can be used for purposes of analytical comparability.

## 3.5 Conclusion

In conclusion, the three PES meta-discourses in Son La identified in this study reflect the transition of the economy and forest governance practices in Vietnam. They represent a snapshot of PFES discussions in not only in Son La province but also the country and the outcome of years of national policy debate and implementation. They also indicate a relatively high level of acceptance of PFES as a policy tool in forest governance, especially in the aspect of bringing-in significant and stable financial resources to forestry sector. It is agreed among discourses that PFES success is an important ground for the state to intensify its authoritarianism over forest resources. With expansion of state power in forest governance, concerns remain mostly on how PFES delivers desirable economic and environmental outcomes without an accountable monitoring system that is detachable from political interests, and how to empower local farmers in participating in PFES decision making and implementation.



## Acknowledgments

This research was funded by the Australian Centre for International Agricultural Research, Grant number FST/2016/152; and the research programmes on Forests, Trees and Agroforestry (TFA) and the Policies, Institutions, and Markets (PIM) Programme of the Consultative Group on International Agricultural Research. We thank our colleagues from the World Agroforestry and the Vietnamese Academy of Forest Sciences for their support to our research. We thank interviewees who agreed to participate and openly shared information, perspectives, and insights during the surveys, discussions, and other activities during the study period.



## **4. Enhancing community engagement in governing landscape and ecosystem services: a participatory land-use scenario development**

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The contents of this chapter have been published in *Environmental Management*:

Do, T. H., Vu, T. P., Catacutan, D., & Nguyen, V. T. (2021). Governing Landscapes for Ecosystem Services: A Participatory Land-Use Scenario Development in the Northwest Montane Region of Vietnam. *Environmental Management*, 68: 665–682.doi:10.1007/s00267-020-01378-2

## Abstract

Land-use planning is an important policy instrument for governing landscapes to achieve multifunctionality in rural areas. This paper presents a case study conducted in Na Nhan commune in the northwest montane region of Vietnam to assess land-use strategies toward multiple ecosystem services, through integrated land-use planning. The assessment employed the Land-Use Planning for Multiple Ecosystem Services (LUMENS) framework and a number of methods and tools, including land-use mapping, GIS-based land-use change analysis, survey questionnaire, rapid carbon-stock appraisal for different land uses, qualitative ecosystem services assessment and a back-casting technique. Our findings suggest that a lack of participation and acknowledgement of customary land-use practices inhibit successful implementation of current land-use planning and relevant policies such as payment for forest environmental services and the nationally determined contributions. The study also confirmed the contributions of forests and the land-use sector in achieving national emission reduction targets, especially when local stakeholders are involved early in the planning process. Other findings with important policy implications are: (i) tree-based land uses such as agroforestry are key to securing multiple ecosystem services and are highly relevant to local stakeholders, yet their potentials were not made explicit in current debates at the local level; (ii) local stakeholders are highly aware of the co-benefits of ecosystem services to climate change mitigation and this should be considered in nationally determined contributions; and (iii) an approach for integrated, participatory land-use planning can help catalyse stakeholder engagement, and hence improve governance in rural landscapes.

## 4.1 Introduction

Landscape governance is a challenging process in the context of achieving landscape multifunctionality due to the multiplicity of stakeholders, institutions, scales, and ecosystem services (Cockburn et al. 2018). Governing and managing the physical landscape and social actors in the landscape requires intensive knowledge and good planning systems. Land-use planning is a powerful instrument in landscape governance because it directly guides how actors will intervene in the physical landscape (land use) to gain commonly desired values. It is essential for sustaining rural landscapes and improving the livelihoods of rural communities (Bourgoin and Castella 2011; Bourgoin et al. 2012; Rydin 1998), ensuring landscape multifunctionality (Nelson et al. 2009; Reyers et al. 2012), and enhancing efficiency in carbon sequestration in particular (Bourgoin et al. 2013; Cathcart et al. 2007). Land-use planning is also considered critical to the successful implementation of land-based climate mitigation efforts such as the nationally determined contributions (NDCs)<sup>13</sup>, as the Land use, land-use change and forestry (LULUCF) sector is included in the mitigation contributions of nearly 90 percent of countries in sub-Saharan Africa, Southern Asia, Latin America and the Caribbean Region (Strohmaier et al. 2016).

Vietnam proposed nine forest- and land-use based mitigation options in its NDC under LULUCF to reduce emissions and enhance removals (MONRE 2015). However, challenges lie in the way in which national priorities and targets are translated into sub-national delivery plans and the way in which sub-national actors are mobilised (Hsu et al. 2019). These challenges stem from the legal framework for climate change mitigation,

<sup>13</sup> Nationally determined contributions (NDCs) are efforts of the signatories to the Paris Agreement to reduce national emissions and adapt to climate-change impacts. Article 4, paragraph 2 of the Paris Agreement requires “each Party to prepare, communicate and maintain successive nationally determined contributions (NDCs) that it intends to achieve” through domestic mitigation measures.

which is elaborated at the national rather than at subnational level, while coordination between government bodies and among stakeholders are generally ineffective (UNDP, 2018). Our proposition is that a participatory, integrated rural land-use planning approach that involves local stakeholders in land-use decision-making and analysis of co-benefits (e.g. ecosystem services and social benefits) is key to the achievement of NDC. Such an approach has profound implications for climate change, and local efforts addressing climate change might change the nature of local land-use patterns (Lindley et al. 2006; Moser & Luers 2008; Moser & Tribbia 2006; Travis 2008). In addition, the ability of participatory land-use planning to integrate local perspectives and knowledge into development strategies helps ensure that social, natural and environmental features are included in site-specific solutions and reflected in more effective development plans (Strohmaier et al. 2016; van Berkel & Verburg 2012; van Lier 1998).

In many developing countries, conventional top-down, centralised land-use planning approaches have been widely practiced with very little success due to a lack of flexibility in adapting to local peculiarities (Amler et al. 1999; Ducourtieux et al. 2005; Kauzeni et al. 1993). Participatory practices, on the other hand, often enhance planning quality and feasibility (Luyet et al. 2012; Nguyen et al. 2006; Reed 2008). Enhancing participation of local stakeholders in land-use planning should be acknowledged as a part of larger debates on local empowerment and decentralisation of decision-making (Bourgoin et al. 2013; Chhatre & Agrawal 2009; Phelps et al. 2010; Toni 2011). This is a challenging task considering the long history of traditional top-down planning in the land-use and forestry sectors (Castella et al. 2005; Lambin & Meyfroidt 2010; Ohlsson et al. 2005), and the implementation of poorly designed incentive mechanisms in afforestation, reforestation and protection that often left out the poorest groups (Clement & Amezaga 2009; Landell-Mills & Porras 2002). In forest-agriculture mosaic landscapes, the

fundamental question is how land-use planning can best conserve forest and agricultural lands, as sources of both income and environmental services (O'Farrell and Anderson 2010).

Our study aims to shed light on how actors in a rural landscape can prepare their own land-use plan to address socio-economic and environmental needs, including climate change mitigation and the provision of ecosystem services, and how this process can help to inform policymaking and implementation of strategies such as the NDC. The study was undertaken at commune level, the lowest jurisdictional tier of the administration system in Vietnam, where socio-economic and environmental plans and decisions are made. Specific questions are: (i) How has land use changed in the Na Nhan landscape?; (ii) How have land-use changes affected above-ground biomass carbon?; (iii) How do local stakeholders perceive their desired future landscapes and strategies to achieve them?; and (iv) How do local stakeholders perceive the impacts of the development scenarios on the provision of ecosystem services and greenhouse gas emissions and carbon sequestration?.

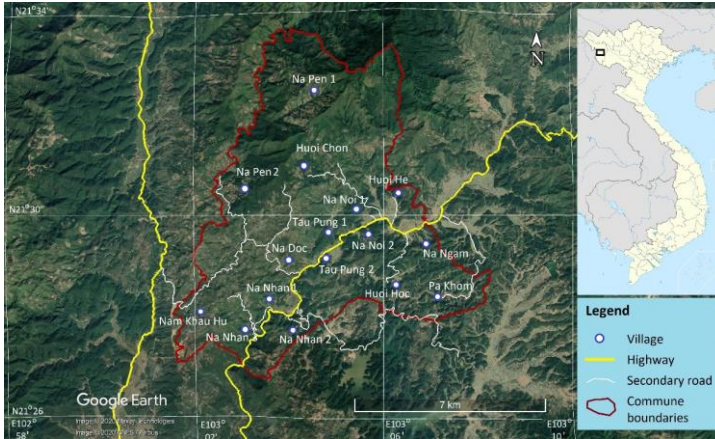
## 4.2 Methodology

### 4.2.1 Study Site

Our study was conducted in Na Nhan Commune, Dien Bien District, Dien Bien Province, northwest Vietnam (Figure 4.1). The commune is located within a catchment upstream of the Nam Ron River running from Dien Bien District to Laos PDR. The average elevation of the commune is 850 m above sea level.

According to the Na Nhan's Commune People Committee (CPC), the commune has a population of 5,000 people distributed over approximately 1,000 households. Three ethnic groups living in the commune include the Thai (72% of the population), H'mong

(27%), and Kinh (1%). Based on government standards<sup>14</sup>, the majority of local households are either poor (421 households) or near poor (253 households). The primary livelihoods in the commune are agriculture and forest-related activities like collecting non-timber forest products (Na Nhan CPC 2016a).



**Figure 4. 1** Location of the Na Nhan Commune - study site in Northwest Vietnam (Source: Adapted from Administrative map of Na Nhan Commune and Google Earth Image 2017).

## 4.2.2 Methods

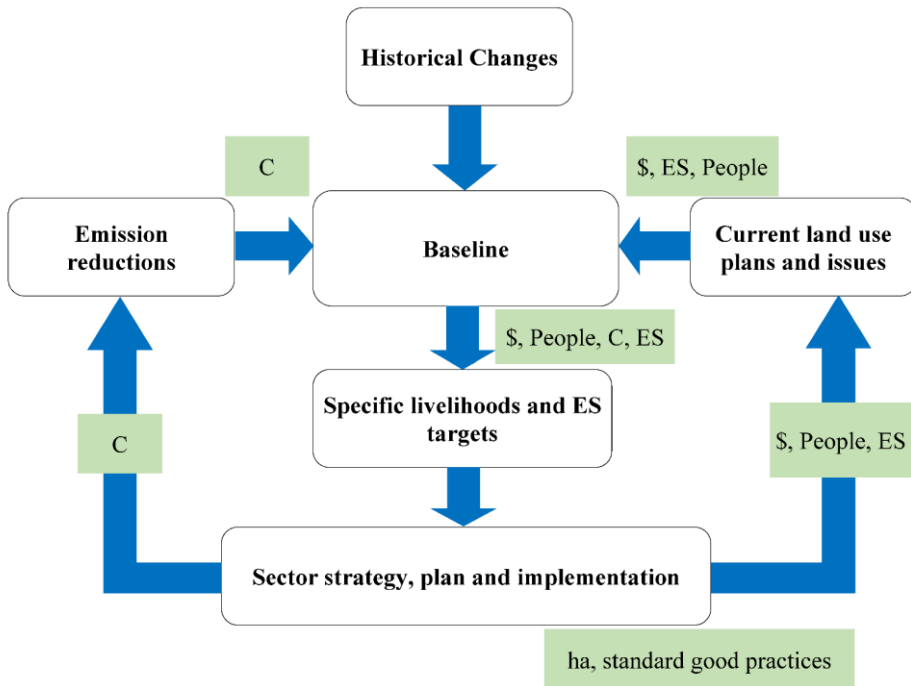
### 4.2.2.1 Methodological Framework

We applied the Participatory Land Use Planning for Multiple Ecosystem Services (LUMENS) framework developed by Dewi et al. (2015) to allow for multi-stakeholder negotiations in planning sustainable landscapes that can support livelihoods and development, while maintaining and restoring environmental services. The overall LUMENS framework (Figure 4.2) consists of four main steps: (1) Compilation of local land-use issues and perspectives on current land-use plans; (2) Estimation of historical greenhouse gas emissions and sequestration from all land-use change; (3) Participatory development of baseline and LUMENS scenarios in which the latter adopted land-use

<sup>14</sup> Decision No. 59/2015/QĐ-TTg issued on November 19, 2015 of the Prime Minister of Vietnam on promulgating the multi-dimensional approach to poverty standard for the period of 2016–2020.



interventions preferred by local stakeholders; and (4) Assessment of impacts of the developed scenarios on the landscape's ecosystem services with stakeholder feedback. Methods such as structured interviews, focused group discussions, land-use change mapping, rapid carbon-stock appraisal, and back-casting for scenario development were employed as described in the sub-sections below.



**Figure 4. 2 LUMENS Framework (Source: Adapted from Dewi et al., 2015)**

#### 4.2.2.2 Structured Survey Questionnaire for Local Socio-economic Conditions and Issues around Land-Use Planning

Household interviews were conducted using a structured survey questionnaire involving 34 households in Na Nhan Commune. The households were randomly selected from a list of households that has been stratified according to income status (poor, near poor and non-poor) provided by the CPC. Respondents were representatives of the

stratified households who are either the household head or a family member with knowledge of the farming and economic situation of the household. Representativeness was ensured through information exchange between the enumerators and village heads. The survey aimed to generate a baseline of the households' socio-economic conditions, as well as local perspectives on natural resource use and landscape management, including land, soil, tree, forest, and water. Data was stored in Microsoft Access and analysed using Microsoft Excel.

#### **4.2.2.3 Land-Use Change Mapping and Above-ground Biomass Carbon-Stock Estimates for 2005–2015**

##### **Land-Use Change Mapping**

Land-use and forest-cover classification includes nine land-use types (see Table 4.1) wherein eight land-use and -cover classes were defined as per the Ministry of Agriculture and Rural Development (MARD)<sup>15</sup>, and one class (tree-crop plantation) based on the guidance of the Ministry of Natural Resources and Environment (MONRE) for “perennial crops”<sup>16</sup>. There were no “non-tree” perennial crops (such as coffee, banana, etc.) in Na Nhan; we therefore defined “perennial crops” as “tree-crop plantations” (MONRE’S definition). Data from different sources was used to analyse land-use changes such as: (i) 2005–2015 forest-cover maps of Na Nhan Commune provided by the Forest Inventory and Planning Institute (FIPI) (FIPI 2006, 2016); (ii) 2015 land-use map of Na Nhan Commune (Na Nhan CPC 2016b), which was standardized according to the guidance of the Ministry of Natural Resources and Environment (MONRE)<sup>17</sup>; (iii) Processed SPOT5 images and Landsat acquired in 2005 and 2015 from MONRE and

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<sup>15</sup> Circular No. 34/2009/TT-BNNPTNT of Ministry of Agriculture and Rural Development on criteria for forest definition and forest classification

<sup>16</sup> Circular No. 28/2014/TT-BTNMT issued on June 2, 2014 of the Ministry of Natural Resources and Environment on regulations on land statistics and inventory and mapping land-use status.

<sup>17</sup> *ibid.*

Google Earth<sup>18</sup> to update forest-cover maps; and (iv) Statistical data and reports from district and commune authorities on socio-economic conditions.

A field survey was conducted to ground-truth the land-use status indicated on the maps. A total of 231 random sampling points (see [Table 4.1](#)) were selected based on: (i) natural and socio-economic characteristics; (ii) agricultural practices of farmers in the study area; and (iii) reference maps such as land-use and forest-cover maps. Survey routes were designed to go through as many different types of land-cover/land-use (on the reference map) as possible. In each sampling point, the information collected included coordinates, elevation, land-use types, and vegetation-cover description.

The “Object-based image analysis” approach with the support of eCognition software was applied to classify and interpret the images. The reference points for interpretation, update of the maps and accuracy assessment were collected in the field from sampling points. Change detection, using a map overlay method, was applied for registration of the 2015 forest-cover map boundaries on the 2005 forest-cover map, ensuring consistent parcel boundaries over time where such boundaries exist. Assessment of the accuracy of land-use and forest-cover mapping followed the methods used by [Olofsson et al. \(2013, 2014\)](#).

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<sup>18</sup> Google Earth Pro Software by Google LLC.

**Table 4. 1** Sampling points for updating land-use maps and measurement plots for biomass estimates

No	Land-use/cover types	Number of sampling points for maps update	Numbers of measurement plots for tree biomass estimation	
			Plot A	Plot B
1	Broadleaf evergreen forest - rich	0	0	0
2	Broadleaf evergreen forest - medium	21	6	6
5	Broadleaf evergreen forest - poor	37	5	5
4	Planted forest	6	5	0
5	Bare land (scattered trees)	10	5	0
6	Bare land (grass and shrubs)	14	5	0
7	Tree-crop plantation (mono-plantation of fruit trees or industrial tree species such as rubber)	44	3	0
8	Annual crops	68	0	0
9	Water bodies and other land uses	31	0	0
<b>Total sampling points/measurement plots</b>		<b>231</b>	<b>29</b>	<b>11</b>

*Source:* Authors' field work

Land-use changes for the period, 2005–2015 were identified by overlaying the 2005 and 2015 land-use maps. Changes in land use during this period are reflected in the land-use change matrix and on the map. The drivers of land-use change were assessed through group discussions and consultation meetings.

### Estimate of Changes in Above-ground Biomass Carbon Stock

Counted carbon pool includes above-ground biomass carbon of forestland (natural and planted forests), grass and shrub land and tree-crop plantations. Trees' aboveground biomass (AGB) in forestland and tree-crop plantation was estimated using following allometric equations:

- Trees (Chave et al. 2014):  $AGB = 0.0673 * (D^2 * H)^{0.976}$  (4.1)

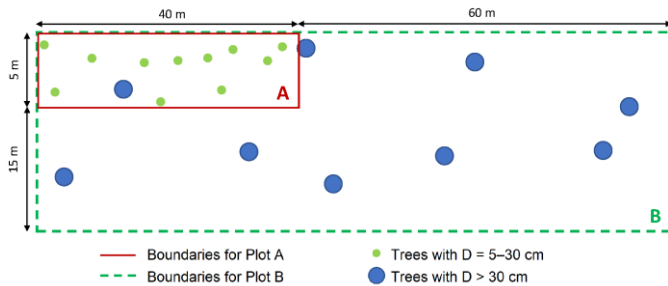
- Shade coffee (Segura et al. 2006):  $AGB = \exp(-2.719 + 1.991 * \ln D) * \log_{10} D$  (4.2)

- Pruned coffee (Arifin 2001):  $AGB = 0.281 * D^{2.06}$  (4.3)

- Fruit trees (Schroth et al. 2002):  $AGB = -6.64 + 0.279 * BA + 0.000514 * BA^2$  (4.4)

Where:  $\rho$  is basic wood density ( $\text{g}/\text{cm}^3$ );  $D$  is diameter at breast height (cm);  $H$  is total tree height (m); and  $BA$  is basal area ( $\text{cm}^2$ ). The values of  $\rho$  depend on specific tree species and are taken from [Vu et al. \(2015\)](#).

The plot measurement for AGB estimates was set up randomly to measure diameter at breast height ( $D$ ) and total height ( $H$ ) of trees. A total of 40 plots were set up, of which twenty-nine plots were type A plots of  $200 \text{ m}^2$  each ( $5 \text{ m} \times 40 \text{ m}$ ) and eleven plots were type B plots of  $2,000 \text{ m}^2$  each ( $20 \text{ m} \times 100 \text{ m}$ ) (see [Table 4.1](#) and [Figure 4.3](#)). The A plots were used to measure  $D$  and  $H$  of all trees with  $D$  from  $\geq 5$  and less than  $30 \text{ cm}$ , and the B plots were designated to measure trees with  $D > 30 \text{ cm}$  if this type of  $D$  appeared inside plot A ([Hairiah et al. 2010](#)). For non-forest land uses such as shrubs and grassland, the information on key species, average coverage and height, etc. was recorded.



**Figure 4. 3** Layout of plot measurement for AGB estimates (Source: Adapted from [Hairiah et al. 2010](#)).

To estimate carbon-stock in above-ground biomass, we used the IPCC default values for carbon fraction (0.47) ([IPCC 2006](#)). The above-ground carbon-stock values of grass and shrub lands were adapted from [Vu \(2006\)](#) and carbon-stock of annual crops, residential and water bodies were assumed to be zero ([IPCC 2006](#)). Since there was no future estimate for carbon-stock of land uses, we conservatively estimated the carbon-stock of land uses per hectare to be unchanged. The fruit-tree based agroforestry system and improved home garden were two land-use types not found in the landscape at the time

of measurement (hence could not be measured), but were considered later in the land-use change scenario development by local stakeholders. Therefore, we adopted time-averaged above-ground carbon-stock values for those two land-use types, drawing from [Roshetko et al. \(2007\)](#) who compiled the carbon-stock values of smallholder agroforestry in Southeast Asia using a similar approach as suggested by [Hairiah et al. \(2001, 2010\)](#).

#### **4.2.2.4 Developing Land-Use Scenarios for Multiple Ecosystem Services Toward 2040**

In the context of integrated landscape management in rural areas, multi-stakeholder platforms are important to achieve the goals of conservation, emission reduction, livelihoods and agricultural production ([Kusters et al. 2018](#)). We conducted a stakeholder consultation workshop with 45 participants representing Dien Bien Province and Na Nhan Commune stakeholders, including the Department of Agriculture and Rural Development (DARD), the Department of Natural Resources and Environment (DONRE), commune leaders, agriculture extension staff, environment and cadastral staff, and some village heads. The overall objective of the workshop was to create a common understanding and vision amongst stakeholders on how to secure multiple ecosystem services in the commune — the goals, plausible interventions, actors involved, support needed, and to understand governance-related issues. The workshop began with an exercise for participants to familiarize with the topics of land use, land-use changes and impacts on greenhouse gas emissions and ecosystem services. To ensure that stakeholders easily understand the concept of ecosystem services, we interpreted ecosystem services as “benefits” that the landscape provides to local communities for current and future generations. Based on existing studies and frameworks, we identified 20 ecosystem services that aligned with four functional domains: life support, regulation,

provision, and information. The ecosystem services selected for assessment were soil formation, nutrient cycling, biodiversity (although this is arguably not an ecosystem service, but herein listed considering its tight link to ecosystem services and importance to local livelihoods), climate and weather regulation, water regulation, mitigation of natural disaster, water purification and waste treatment, anti-soil erosion, carbon storage, biological control, pollination, clean water, provision of food, fuel, wood, fiber, fodder, fertiliser and medicine, natural scenery, tourism and entertainment, and cultural and spiritual values. Participants were asked to identify key land uses and land-use changes in the commune, and to rank changes in ecosystem services (shown on cards) with respect to each land-use type. This was followed by a back-casting exercise (van Asselt et al. 2012) for participants to set up targets for the future landscape as well as proposing interventions to achieve their targets. After agreeing on common goals, the stakeholders were randomly split into two groups (for the sake of discussion facilitation) to formulate a LUMENS scenario (interventions, location for each intervention, actors and policy support needed for the interventions). Land-use maps from 2005 and 2015 (see Section 4.2.2.3) were provided to stimulate the group discussions. It was explained to participants that the impacts of suggested interventions will be evaluated after the workshop using a thematic software.

The impacts of proposed land-use interventions to the landscape's greenhouse gas emissions and sequestration (above-ground biomass pool) were assessed using REDD Abacus<sup>19</sup>, a public domain software developed by the World Agroforestry (ICRAF) mainly to facilitate land-use planning for low-emission development strategies at subnational levels. The software employs a transition probability matrix, i.e. the Markov chain (Rozario et al. 2017) in land-use change projection. A transition is defined as a

<sup>19</sup> Available at <https://sourceforge.net/projects/redd-abacus/>

change in land-use/cover, and the matrix shows the probability of a land-use/cover change taking place from one state to another within a specified time period based on initial land-use changes. Two scenarios were simulated for a 25-year period (2015–2040): a business-as-usual (BAU) scenario was based on linear projection of historical land-use change during 2005–2015 (see [Annex 4](#)), and a LUMENS scenario based on both historical land-use changes and land-use interventions suggested by local stakeholders during the back-casting exercise.

## 4.3 Results

### 4.3.1 Land-Use Changes in the Na Nhan Landscape (2005–2015)

Significant changes in land use in Na Nhan Commune have been recorded between 2005 and 2015 ([Table 4.2](#); the full matrix of land use changes provided in [Annex 4](#)). The largest change took place in the bare land with shrubs and grasses. This area was reduced from 3,369.6 ha to 774.4 ha, which accounts for 34.1% of the total commune area. More than 50% of these areas were zoned and regenerated into poor evergreen broadleaf forests. The remainder was converted into cultivated land for short-term agricultural crops and other uses. The area of evergreen broadleaf forest in 2015 had increased more than 2.8 times compared to the area in 2005, with 1,995.9 ha, accounting for 26.2% of the total land area of the commune. The area of annual crops was also 1.5 times higher than in 2005. The tree-crop plantations, water bodies and other land uses were almost unchanged ([Table 4.2](#)). The results of accuracy assessment of land-use and forest-cover maps indicated that at 95% confidence level, the overall accuracy of land use mapping was 94%; specifically, the accuracy level of poor and medium evergreen broadleaf forest classification was between 82% and 92%.



**Table 4. 2 Area by land-use types, Na Nhan Commune (2005 and 2015)**

No	Land-use/cover types	Area in 2005 (ha)	Area in 2015 (ha)	Change area (ha)	Change/ Total area ratio (%)
1	Evergreen broadleaf forest - rich	0	0	0	0
2	Evergreen broadleaf forest - medium	137.6	158.0	+20.4	+0.3
3	Evergreen broadleaf forest - poor	976.3	2,951.9	+1,975.5	+25.9
4	Planted forest	334.7	56.4	-278.3	-3.7
5	Bare land with scattered trees	776.8	710.4	-66.4	-0.9
6	Bare land with grass and shrubs	3,369.6	774.4	-2,595.2	-34.1
7	Tree-crop plantation (mono-plantation of fruit trees or industrial tree species such as rubber)	50.5	47.8	-2.7	0
8	Annual crops	1,747.2	2,665.9	+918.8	+12.1
9	Water bodies and other land uses	207.0	234.9	+27.9	+0.4
<b>Total</b>		<b>7,599.6</b>	<b>7,599.6</b>		

Source: Authors' work adapted from [FIP \(2006, 2016\)](#)

During this period, most of the bare lands with fallow were either restored to poor secondary forests or reused for agricultural production. Effective forest protection and development has increased the forest area by 2.8 times compared to 2005, accounting for 41.7% of the total area of the commune. The traditional farming practices of local people were mainly slash and burn. After a period of continuous cultivation, soils were eroded, resulting in a dramatic decline in food-crop yields, so that the soil was left unused for 5–6 years to restore its fertility. Since 2006, with the dissolution of the Dien Bien District Afforestation Yards, most of the forests and forestlands were allocated to the CPC with an understanding that they were to manage these lands with the participation of village communities. Some villages in Na Nhan Commune have applied for community forest management with clear regulations for forest protection and management. The village people were allowed to collect timber inside community forests for house construction under the supervision of the village leaders/committee, resulting in reduced deforestation or slash-and-burn practices.

### 4.3.2 Effects of Land-Use Changes on Above-Ground Biomass Carbon Stocks

Our land-use time-averaged above-ground carbon-stock measurements show that the highest carbon-stock is found in natural forests (49.3–79.3 tC/ha), followed by planted forests (36.3 tC/ha) and tree-crop plantations (26.4 tC/ha) (see [Table 4.3](#)).

**Table 4.3** Estimated time-averaged above-ground carbon stock of land uses in Na Nhan Commune

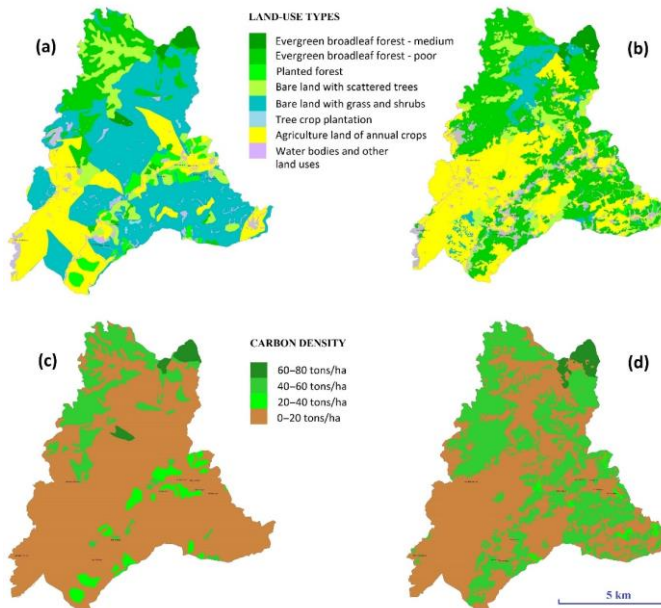
TT	Land-use/cover types	Timber volume (m <sup>3</sup> /ha)	Above-ground carbon stock	
			tC/ha	SE
1	Evergreen broadleaf forest - medium	149.8	79.3	17.2
2	Evergreen broadleaf forest - poor	78.9	49.3	7.2
3	Planted forest	100.3	36.3	10.6
4	Bare land with scattered trees	24.3	13.6	3.1
5	Bare land with grass and shrubs	16.9	10.2	2.2
6	Tree-crop plantation (mono-plantation of fruit trees or industrial species such as rubber)	43.5	26.4	6.4
7	Agroforestry (fruit trees dominant) <sup>a</sup>	-	30.0	-
8	Improved home garden (fruit trees dominant) <sup>a</sup>	-	20.0	-
9	Annual crops; water bodies and other land uses	-	0	-

Source: Authors' work

<sup>a</sup>Adapted from [Roshetko et al. \(2007\)](#) (tC = ton Carbon; SE = Standard Error)

In 2005, the total amount of above-ground carbon stored in evergreen broadleaf forest accounted for 50.2% of the landscape's total carbon-stock (117,576 tC), followed by the bare land with grass and shrubs (29.3%), planted forests (10.3%), and bare land with scattered trees (9.0%). By 2015, above-ground carbon storage of evergreen broadleaf forest and bare lands contributed to about 88.3% and 9.8% of landscape's total carbon stock (178,894 tC), respectively. Overall, the total above-ground carbon-stock of all land uses in the commune had a net increase of 61,319 tC between 2005 and 2015 ([Figure](#)

4.4). Generally, the increase in above-ground carbon-stocks was mainly due to natural forest regeneration from bare lands with grass and shrubs that were abandoned (fallow period) after a certain period of cultivating upland crops. The largest increase in above-ground carbon-stock (97,000 tC) was attributable to forest regeneration - a large area of bare land with scattered trees in 2005, which has developed into evergreen broadleaf forest in 2015.



**Figure 4. 4** Land use and carbon density maps of Na Nhan Commune (2005 and 2015) ((a) land-use map 2005; (b) land-use map 2015; (c) above-ground biomass carbon density map 2005; (d) above-ground biomass carbon density map 2015) (Source: Authors' work adapted from FIPI (2006, 2016)).

### 3.3. Changes of Ecosystem Services Provided at Landscape Level – Stakeholders'

#### Perceptions

By eliciting participants' assessments for 20 ecosystem services mentioned in Section 2.2.4, we were able to compare their relative importance, trends (declining, improving, or unchanged) during 2005-2015, and the roles of key ecosystems in providing such services (Table 4.4).

**Table 4. 4 Stakeholder's awareness of ecosystem services provided at landscape level**

Ecosystem services	Natural forest	Planted forest	Upland annual crops	Perennial plantation	Mixed home garden	Lowland annual crops	Fallow land	Water surface
Soil formation	5 (--)	4 (++)	0	1 (++)	0	0	2 (+++)	0
Nutrients cycling	5 (--)	3 (++)	0	2 (++)	0	0	2 (+++)	0
Biodiversity	5 (--)	1 (+++)	0	2 (++)	1 (++)	0	4 (+)	1 (+)
Climate and weather regulation	5 (---)	4 (++)	0	2 (++)	2 (+)	0	1 (+)	2 (+)
Regulation of water flows	5 (---)	4 (--)	0	3 (-)	2 (+)	0	2 (+)	3 (---)
Mitigation of natural disaster	5 (--)	4 (+++)	0	2 (+++)	1 (--)	0	1 (++)	0
Water purification and waste treatment	5 (---)	4 (--)	0	3 (-)	2 (+)	0	2 (-)	0
Anti-soil erosion	5 (---)	4 (--)	0	2 (-)	1 (-)	0	2 (-)	0
Carbon storage	5 (---)	5 (++)	0	2 (++)	1 (+)	0	3 (++)	0
Biological control	5 (--)	3 (--)	0	2 (---)	1 (---)	0	3 (+)	3 (--)
Pollination	5 (--)	4 (---)	2 (---)	3 (--)	2 (--)	2 (---)	2 (+)	0
Clean water	5 (---)	3 (--)	0	2 (-)	0	0	2 (-)	0
Food	3 (---)	2 (-)	5 (--)	3 (-)	3 (--)	5 (+++)	0	3 (--)
Fuel	5 (--)	3 (++)	0	2 (+)	0	0	2 (+)	0
Wood and fiber	4 (---)	4 (++)	0	1 (+)	0	0	2 (+)	0
Fodder and fertiliser	3 (---)	0	5 (+++)	0	3 (++)	4 (+++)	3 (++)	0
Medicine	3 (---)	0	0	0	1 (++)	0	2 (++)	0
Natural scenery	5 (++)	4 (++)	3 (+)	3 (++)	2 (++)	2 (++)	1 (-)	3 (++)
Tourism and entertainment	2 (++)	3 (++)	0	3 (++)	1 (++)	0	1 (-)	4 (++)
Cultural and spiritual values originated or derived from land-cover types	3 (++)	2 (++)	3 (++)	2 (++)	1 (++)	3 (++)	0	2 (+)
<b>Total</b>	<b>88</b>	<b>61</b>	<b>18</b>	<b>40</b>	<b>24</b>	<b>16</b>	<b>37</b>	<b>21</b>
<b>Highest possible points</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

Source: Authors' field work

Key: Number scores indicate the significance of ecosystem services that are: vital (5), important (4), fairly important (3), somewhat important (2), slightly important (1) and not relevant (0). The letters in brackets indicate qualitative assessment of ecosystem service quality: declining significantly (---), declining (--), declining slightly (-), improving slightly (+), improving (++), and improving significantly (+++).

Results suggest that participants were aware of the role of tree-based ecosystems in providing several environmental services in the landscape. The scores indicate particularly the importance of natural forest (88/100) and planted forest (61/100) in this regard, while non-tree-based ecosystems or cultivation with annual crops in flat and sloping lands were both well under 20/100 (Table 4.4). Specifically, stakeholders perceived a strong correlation between tree density and its role in the provision of ecosystem services. Although forest cover has been increasing recently, the forest's ecosystem service provisioning capacity has been declining as a result of decreased forest quality. On the positive side, perennial plantations and fallows are the two ecosystems that were improving in most aspects of ecosystem service provision. Perceptions of the role of forest- and tree-based land uses in securing wellbeing and agricultural production might trigger attitude and behavioral changes amongst local stakeholders. In developing the LUMENS interventions (Section 4.3.4), stakeholders expressed their interest in enhancing tree-based systems through forest management, agroforestry, and home garden intensification.

#### 4.3.4 Local Stakeholders' Desired Future Landscapes and Strategies to Achieve Them

Household participation in the land-use planning process, which is fundamental to effective and inclusive landscape governance, was found very low. About 32% of respondents (11 out of 34 respondents) reported that they were not aware that their participation in land-use planning consultation is regulated by law, while 68% (n=23) had no idea on the topic. Consequently, 94% of respondents (n=32) said they had no idea whether the existing land-use plan is satisfactory or not; only 3% of respondents (n=1) said they were satisfied with the current land-use plan; the remaining 3% (n=1) was not satisfied with the plan. In terms of land-use planning implementation, only 3% of

respondents (n=1) said they had been informed about the results, while 26% (n=9) had not been informed and another 71% (n=24) had no idea. When asked to answer a multiple-choice question about the benefits of having commune- and district-level land-use plans, only 4 out of 34 respondents made at least one choice, while 30 respondents had no choice at all. The four who perceived benefits primarily emphasized 'Better forest management' and 'Better environmental protection'. Benefits selected by two of them included 'Proper land allocation for different purposes', 'Mitigation of land conflicts', and 'Facilitation of traditional and customary cultivation and land-use practices'. Only one respondent selected 'clear and secure land-use rights' a perceived benefit of land-use plans.

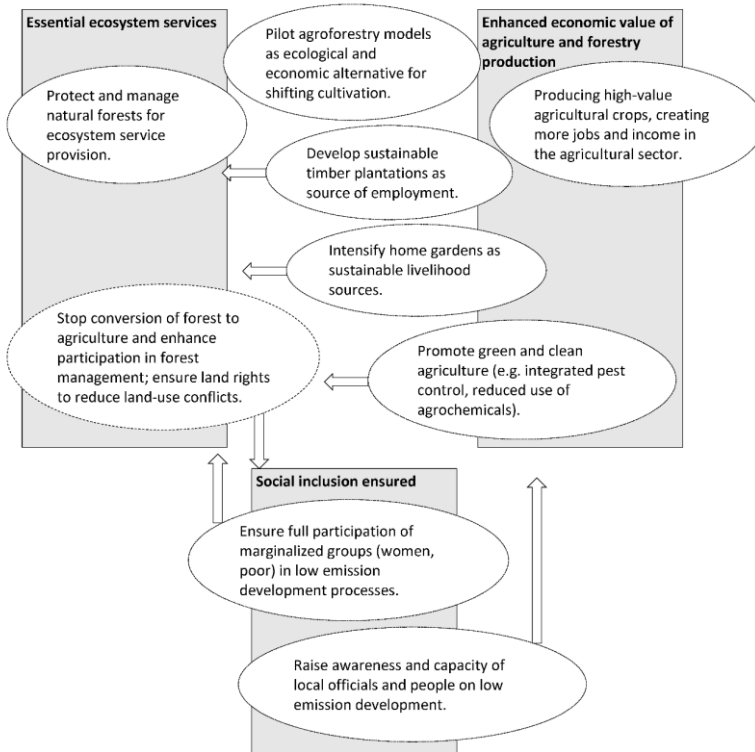
In terms of land administration, all settlement and lowland agricultural areas have been legally allocated to households for permanent use. Administration of forest lands (mostly slope land) was, however, more complicated—forest dwellers have been provided with land-use rights certificates (Red Book) for forestry purposes only (forest plantation, forest enrichment, etc.). Some forest-land users did not have Red Books, but were using forest lands for agricultural purposes. The use of forest plots as agricultural land was *de facto* tolerated: local government acknowledged local customary cultivation practices but was reluctant to provide legal recognition. This was an obstacle for the forestland allocation process, not just in Na Nhan Commune, but in Dien Bien Province as a whole.

In order to enhance local stakeholder engagement in land-use planning, we piloted a back-casting exercise (see Section 4.2.2.4). This exercise resulted in a balanced ambition of stakeholders to take the lead in their future landscape, which included: (1) pursuing

high value agricultural production through “clean agriculture”<sup>20</sup> and agroforestry; (2) maintaining and improving essential ecosystem services, particularly water regulation, biodiversity, and carbon sequestration services; and (3) ensuring social inclusion in development through appropriate landscape governance mechanisms. Workshop participants emphasized that current agricultural practices must shift to those that preserve landscape integrity and beauty and deliver better economic opportunities to the local residents. They also discussed and agreed on strategies to achieve these goals (see [Figure 4.5](#)). The strategies were initially developed for each goal, but mapping of the results by stakeholders revealed that many of them are “shared” (combined), as a result of which a single strategy contributes to more than one goal.

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<sup>20</sup> “Clean agriculture” was perceived by participants as agricultural practices that demand less “toxic” chemical inputs and therefore produce “safe” products that can be sold at higher market price. In the local context, this was particularly relevant to annual crops of canna (*Canna edulis*), peanut (*Arachis hypogaea*) and taro (*Colocasia antiquorum*), those have high market demands but at the same time are often perceived by customers as “unsafe food”, i.e. containing harmful chemical substances.



**Figure 4. 5 Goals and strategies towards LUMENS in Na Nhan Commune (Source: Authors' fieldwork).**

After agreeing on the goals and strategies, participants were asked to prepare a table of interventions. The interventions were ranked, and each one had to be linked to a specific land-use type. Participants suggested several interventions, based on perceived benefits of tree-based land uses. All suggested interventions seemed to result in positive impacts on the environment and emission reduction. Participants unanimously agreed that natural forests should be well protected for essential services, and that villages should be supported to develop sustainable forest management plans. Some understory agroforestry models were also recommended to help farmers obtain more income from forest and reduce pressures on forest resources. Participants suggested that economically viable models of forest plantation (acacia and some native timber



plantations) should be developed in parallel with developing a market value chain for timber. This reflected concerns on past failures in forest plantation development in the study site. *Michelia mediocris* plantations have great potential to address this concern, as the tree can provide valuable fruits used as spice and herbs, and some participants preferred this species even without the need to sell timber. Conversion of upland farmland to agroforestry (intercropping agricultural crops and fruit trees) and intensification of mixed gardens were expected to address productivity and soil degradation concerns, but intensive external financial and technical support would be required. Participants wished to pursue annual crop intensification such as for peanut (*Arachis hypogaea*) and taro (*Colocasia antiquorum*) with better cultivation methods and value chain development, and to invest in livestock farming where grazing lands are available (villages of Na Noi and Na Pen). Participants also suggested relevant stakeholders to take the lead in each intervention, and in most cases agriculture and forestry extensionists and the CPC were expected to provide support and guidance. This highlights the need to develop the capacity of local agents to facilitate local land-use planning. As shown in Table 4.5, most interventions were in line with measures to achieve climate change mitigation targets set out in Vietnam's NDC, "*Manage and develop sustainable forest, enhance carbon sequestration and environmental services; conservation of biodiversity associated with livelihood development and income generation for communities and forest-dependent people*" (MONRE 2016).

**Table 4. 5 Proposed land-use interventions for Na Nhan Commune in the LUMENS scenario**

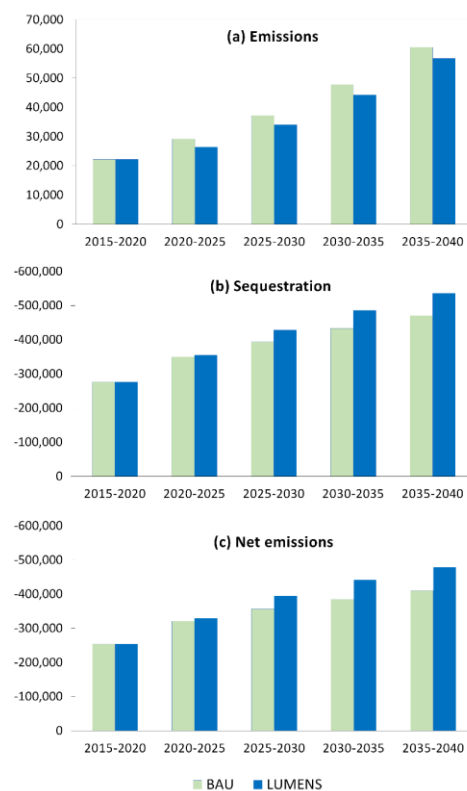
Land-use/cover types	Proposed intervention	Priority level	Area	Locations (village name)	Support policy needed/ currently available	Responsible stakeholders
Natural forest	Forest protection and enrichment; improvement of community forest management capacity for forest protection groups	High	~3000 ha	All villages with allocated natural forests	<ul style="list-style-type: none"> <li>- Capacity building</li> <li>- Support to development of forest management plans (hiring consultant, etc.)</li> </ul>	Provincial Forest Protection Department, forestry extension, CPC, and villagers
	Development of understory NTFP production models ( <i>Cardamom</i> , <i>Amomum</i> , etc.)	Medium	-			
	Develop ecotourism models	Low	-			
Plantation forest	Planting protection and production forests	Medium	-	Tau Pung and Na Nhan villages	<ul style="list-style-type: none"> <li>- Land allocation</li> <li>- Investment (capital and technology)</li> <li>- Market development</li> </ul>	DARD, DPC
	Develop <i>Acacia</i> plantation models combined with market solution	High	200 ha	Tau Pung and Na Nhan villages	( <i>participants could not specify supporting policies needed</i> )	DARD, forestry extension
	Afforestation on bare lands with native species such as <i>Schima wallichii</i> and <i>Michelia mediodoris</i> (10–15 yr. rotation)	High	100 ha	Bare land in Na Nhan village	( <i>participants could not specify supporting policies needed</i> )	DARD, forestry extension
Upland crops	Agroforestry: select suitable species, fruit trees	Medium	-	11 villages with upland fields	<ul style="list-style-type: none"> <li>- Capital investment</li> <li>- Technical assistance and training</li> <li>- Market value chains development</li> </ul>	Agricultural and forestry extension, CPC, village communities

**Table 4. 5 (continue)**

Land-use/cover types	Proposed intervention	Priority level	Area	Locations (village name)	Support policy needed/ currently available	Responsible stakeholders
Upland crops	Planting fruit trees, scattered forest trees and agroforestry	Medium	50 ha fruit trees; 30 ha of agroforestry	Na Noi 1, Huoi He, and Tau Pung villages	(participants could not specify supporting policies needed)	Households Agricultural and forestry extension
	Determination of fruit-growing areas	Medium		Na Nhan 1, 2, 3; Na Doc, Tau Pung 1, 2 villages Na Noi 1, 2; Huoi He, and Huoi Hoc villages	- Financial and technical support - Market development	DPC, CPC, households and local enterprises
	Development of taro plantation area	High		Na Noi, Na Ngam, Huoi He, Tau Pung villages	(participants could not specify supporting policies needed)	Agricultural and forestry extension, CPC, village communities
Grazing land	Cattle grazing	High		Na Pen, Na Noi	- Grass planting techniques and land allocation	Agricultural and forestry extension, Provincial Livestock Center
Agricultural production land (rice land, vegetables)	Applying technical advances to improve rice productivity and quality	High		Whole commune	- Technology transfer - Capacity building - Investment / expansion	Agricultural and forestry extension DARD, CPC and villagers
	Develop high-value peanut cultivation models and peanut value chains	High	50 ha	Na Noi, Na Ngam, Huoi He, Tau Pung villages	(participants could not specify supporting policies needed)	Agricultural and forestry extension, CPC, village communities
Residential land + mixed garden	Improving mixed gardens with several fruit tree species (such as mango and pomelo) and some timber trees	High	100 ha	Whole commune, Na Noi and Na Ngam villages would be prioritized	(participants could not specify supporting policies needed)	(participants could not specify responsible stakeholders)
Canna <sup>a</sup> processing factories	Wastewater treatment (currently three canna-processing factories are discharging wastewater directly into rivers)	-	-	Huoi He, Na Noi, Na Nhan 3 villages	- Tightened regulations on wastewater control and treatment	DARD, DONRE

### 4.3.5 Impact of the Scenarios on Greenhouse Gas Emissions and Carbon Sequestration

Potential impacts of stakeholders' proposed land-use interventions on GHGs emissions and sequestration are shown in Figure 4.6. It should be noted that not all proposed interventions could be simulated due to limited software functionality and input data. The following interventions were parameterized and added into REDD Abacus: *Acacia* and *Michelia mediocris* plantations (as forest plantation and afforestation); fruit tree and agroforestry development; and home-garden intensification.



**Figure 4. 6** Projected accumulated GHGs emissions and sequestration (as  $\text{tCO}_2\text{eq}$ ) of land-use change scenarios in Na Nhan Commune ((a) Projected emissions of BAU and LUMENS scenarios; (b) Projected sequestration of BAU and LUMENS scenarios; and (c) Projected net emissions of BAU and LUMENS scenarios (Source: Authors' work). Note: the negative values of (b) and (c) means carbon sinks

Compared to BAU, emissions under the LUMENS scenario were slightly lower as forest conversion from other land uses is more restricted (Figure 4.6a). According to the projection, the accumulated emissions through land-use changes under a BAU scenario would be 60,533 tCO<sub>2</sub>eq by 2040, compared to 56,753 tCO<sub>2</sub>eq under the LUMENS scenario, offering an emission reduction by 6.3% compared to BAU. As far as sequestration is concerned, both scenarios showed the potential of Na Nhan landscape to sequester CO<sub>2</sub> (Figure 4.6b). The difference in accumulated CO<sub>2</sub> sequestration during the project period would be about 65,092 tCO<sub>2</sub>eq, meaning that the LUMENS scenario offers an increase of 13.8% of greenhouse gas sequestration compared to BAU (Figure 4.6c). It should be noted that the potential emissions reduction and carbon sequestration at landscape level could be higher if all proposed interventions could be accounted for in model simulation, such as improvement of forest quality due to protection efforts by local communities. Impacts of proposed interventions on other ecosystem services (water regulation, biodiversity, etc.) and economic benefits could also be projected to provide a more complete picture that can be used in decision-making. The simulations of LUMENS interventions in this study provided useful information for policymakers to improve the management and governance of the Na Nhan landscape.

#### 4.4 Discussion

Functions and services provided by landscapes are vital to human being and development and should therefore be integrated into land-management decisions. In the context of Vietnam where forest- and tree-based land uses are considered key to achieving national targets of climate change and ecosystem services, it is necessary to (i) determine the role of forest- and tree-based land uses in climate change mitigation to decision- and policy-makers; (ii) enhance awareness of ecosystem services among local stakeholders and mainstream ecosystem services in local land-use planning; and (iii)

engage local farmers in landscape governance. The following sections discuss each of these aspects in more detail.

#### **4.4.1 Tree-based Land Uses and Climate Change Mitigation**

When it comes to climate change mitigation, challenges to rural landscapes such as Na Nhan commune relate to the right combinations of “sparing” and “sharing” (Minang & van Noordwijk 2013) in order to achieve reduced emissions while balancing social and economic trade-offs as perceived by local stakeholders. A more “sharing” approach (i.e. bringing trees onto agricultural lands and recognizing roles of forest in providing essential services to the whole landscape) can be used for reconciling forest protection and development through interventions in different components of a landscape matrix (Sayer et al. 2013).

It is estimated that the land-use sector can contribute up to 10–20% of Vietnam’s national emission reduction targets, mainly generated from forest and tree-based land uses. The annual estimated emission reduction and carbon sequestration enhancement for forests and the land-use sector in Vietnam ranges between 8.2–15.6 Mt CO<sub>2</sub>eq/year (Vu et al. 2018). By 2030, Vietnam commits an increase of 52% in greenhouse gas removals through the Forestry and Other Land Uses (FOLU) activities unconditionally. With international support, this figure could reach almost 145% by 2030 (Escobar Carbonari et al. 2019). Our case study found that low-cost mitigation options such as reforestation and natural regeneration has helped the Na Nhan landscape sequester a large amount of carbon with a net increase of about 61,000 tC between 2004 and 2015. Much of this was attributable to forest restoration in bare land with grass and shrubs and was achieved by a combination of top-down law enforcement and an economic

policy instrument (through the PFES<sup>21</sup> program). However, establishing forest plantations solely based on the economic attractiveness of forest plantation models were less successful. This can be explained by the fact that the economic benefits of planted forest in Northwest Vietnam is significantly lower than other forms of agricultural production (Lan et al. 2016). This suggests a challenge to NDC implementation through economic plantations in upland areas with limited access to markets for timber and non-timber products.

Apart from reforestation and afforestation activities, participants in our case study actively proposed conversion of uphill shifting cultivation land and poorly managed home gardens into mixed fruit tree systems and intensified home gardens (i.e. agroforestry), although the area available for conversion seemed to be small. From a climate change mitigation perspective, these systems sequester carbon, and contribute to building up soil organic carbon. These benefits match with local concerns about declining productivity and soil degradation. Moreover, integrating more trees into current production lands and home gardens diversifies smallholder farmers' incomes, and enhances their economic and environmental resilience to natural disasters (Simelton et al. 2019). In Northwest Vietnam, some agroforestry models have been reported to provide average annual incomes from 870 US\$ ha<sup>-1</sup> y<sup>-1</sup> to 2,905 US\$ ha<sup>-1</sup> y<sup>-1</sup> (Hoang et al. 2015), much higher than that of existing swidden farms.

The fact that Vietnam's NDC do not include agroforestry<sup>22</sup> (Escobar Carbonari et al. 2019) can be interpreted as a missed opportunity to substantially mitigate climate

<sup>21</sup> PFES is Payment for Forest Environmental Services policy that has been implemented in Vietnam since 2010. The policy requires hydropower, water supply and tourism companies to pay forest holders for environmental services provided as input for their business. Payment is based on fixed rates and made through a Government trust fund.

<sup>22</sup> It should be noted that Vietnam's NDCs are now under revision, and agroforestry has been added as one of mitigation options in land use, land use change and forestry sector. However, this could only be confirmed upon an official approval by the Government.

change at low or even negative marginal costs. [Duguma et al. \(2017\)](#) found that agroforestry can sequester between 1.1–34.2 Pg C globally, and that conversion of 25% of deforested area to agroforestry would help 80% of non-Annex I countries achieve their unconditional commitments under NDCs. According to [Simelton et al. \(2019\)](#), the total agroforestry area (i.e. the integration of trees, crops and/or animals on the same land) in Vietnam is about 900,000 hectares, and 10 million hectares are actually suitable for different types of agroforestry. The estimated average carbon gain from the application of agroforestry practices is 2.25 (0.98–4.17) tC/ha/year ([Mulia et al. 2018](#)).

#### **4.4.2 Mainstreaming Ecosystem Services in Local Integrated Land-Use Plans**

Current land-use planning in Vietnam is not fostering effective forest landscape governance and management of natural ecosystems. According to the [UNDP \(2018\)](#), land-use plans are often developed and operated based on inaccurate data and not on considerations of ecosystem functions and services. Our study findings corroborate this claim. Discussions held with provincial and district DONRE indicated that there were no thematic surveys and assessments on the state and need for environmental services and biodiversity conservation, nor considerations of potential climate change impacts and other environmental issues in land-use planning. The newly approved Law on Planning<sup>23</sup> which took effect on 1 January 2019, regulates the implementation of sectorial planning that includes national planning for forestry, environmental protection and biodiversity conservation. These plans can and should provide better information for land-use planning across jurisdictional levels. The challenge is how to quickly move from ideas to actions, and that it is needed to mainstream ecosystem services into local land-use planning ([Goldstein et al. 2012](#)).

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<sup>23</sup> Law on Planning was passed by the National Assembly of Vietnam on November 24, 2017.



This study showed that engaging local stakeholders in land-use and scenario planning may foster integration of ecosystem services concerns in land-use planning. Participants in our case study perceived that the decline of forest quality in the landscape has led to declining provision of ecosystem services. They considered the integration of trees in the Na Nhan landscape was obviously required to improve ecosystem services and generate income for local people. This implies that a wider range of ‘best-bet’ tree-based alternatives for smallholders (both agroforestry and silvopastoral systems) should be examined for their environmental, agronomic and economic benefits, and for the feasibility of their adoption. Such alternatives are certainly relevant to national policymakers seeking sustainable options for northwest Vietnam, where rice and other crop yields are projected to decline by 11–28% and 6–23.5% respectively in the coming years due to climate change ([World Bank 2010](#)).

Local perception of and demands to improve ecosystem services call for further considerations in implementing national policies such as Vietnam’s NDC and PFES. The NDC policy and follow-up studies (e.g. [UNDP 2018](#) and [Escobar Carbonari et al. 2019](#)) have so far been largely based on marginal abatement cost curve (MACC) analysis that is not designed to incorporate environmental and social values in generating abatement costs of land-use changes. A relatively simple, qualitative, and participatory approach as demonstrated in our study can provide pointers in the quest for cost-effective approaches to assess co-benefits (adaptation, social, economic, environmental) of mitigation actions at both subnational and national levels, so that clear targets can be set and tracked, and additional investments can be justified. It is also important to note that although Vietnam has been running the PFES programme since 2010, it is ambiguous whether PFES revenues are integrated in mitigation cost estimation, and how its outcomes are accounted for in policy planning where a number of policies and

commitments overlap (e.g. the NDC, National Green Growth Strategy, Bonn Challenge, Aichi Biodiversity Targets, Convention on Biological Diversity post-2020 Biodiversity Framework, National Action Plan to implement the 2030 Agenda for sustainable development goals, etc.). Since PFES income alone can hardly be comparable to that of destructive economic activities in the northwest and other regions of Vietnam (Lan et al. 2016), it is necessary for local governors to develop plans that wisely combine resources of different programmes and policies in a landscape in order to achieve the SDGs at the lowest possible cost. This cannot be done without integrating science and local knowledge in policy-making process, as shown in this case study.

#### **4.4.3 Bottom-up, Participatory Land-Use Planning Can Help Address Gaps in Landscape Governance**

Landscape governance is often perceived as a “wicked problem” (Termeer et al. 2019) wherein complexity of social, economic, and environmental issues, stakeholders and perspectives lead to difficulty in providing solutions. In the Na Nhan landscape, one of the most profound concerns of governance may be the discrepancies between planned and actual land use. Our study has shown that local farmers’ *de facto* use of degraded forests for agricultural cultivation has not been officially recognized in any land-use plan. The current land-use classification system used for land-use planning is not based on actual land use, but on the purpose for which the land *should* be used according to the government. This differs significantly from the land-use practices of ethnic groups in mountainous areas, who have long been practicing shifting cultivation in upland areas and on sloping lands classified as degraded forests, forest land without forests, bare lands or unused lands, depending on tree cover and other criteria (CIRUM 2012; Pham et al. 2018). Conventional land-use planning may claim a large part of the total land area as forest land, but this is disregarded by local communities. Failure to recognize

traditional land-use systems in land legislations, land-use classifications and land-use planning disadvantages traditional land users and creates potential conflicts during the land-allocation process, and partly leads to low-level stakeholder participation (Ironsides 2017; Nguyen et al. 2008; Pham et al. 2018). In contrast, considering landscape multifunctionality, the use of ‘degraded’ or ‘unused’ forest land for agriculture may be acceptable if well managed, and restoration of ‘degraded’ land via a combination of afforestation and agricultural production can even reduce further degradation and eventually increase the provision of selected ecosystem services (Matson and Vitousek 2006; Rey Benayas & Bullock 2012; Verburg et al. 2013). In that way, land resources can be utilised more effectively to deliver economic and ecological benefits for local inhabitants rather than leaving local governors with the notion that “shifting cultivation is impossible to eradicate and therefore left unreported” (Pham et al. 2018).

Enhanced participation in land-use planning fosters improved landscape governance because it ensures a coordinated process across actors in managing natural resources and ecosystem services and thus can deliver the full range of societal needs (FAO 2017). A number of tools and methods have been readily available to serve this purpose. For example, the LUMENS framework (Dewi et al. 2015) was successfully adopted as a negotiation support framework to develop the Green Growth Action Plan of South Sumatra Province and some other provinces in Indonesia. Barral & Oscar (2012) developed a methodological protocol of strategic environmental assessment to mainstream the valuation of ecosystem services in land-use plans, while Langemeyer et al. (2016) and Saarikoski et al. (2016) proposed the use of multi-criteria decision analysis (MCDA) for similar purposes. These tools have great potential to fill the gaps of ecosystem services assessment in land-use planning in many developing countries. Our case study demonstrated that an approach which combines conventional land-use

mapping of historical changes, participatory future-oriented land-use scenario development, and qualitative ecosystem services assessment in a modeling software (i.e. REDD Abacus) offers a good basis for a comprehensive vision for landscape planning and management. Although the picture would have been more complete if data on land-use economics were obtained, we found this approach effective, especially when maps and visuals were used to enhance stakeholder discussions and stimulate innovations (van Berkel & Verburg 2012). However, uncertainty of land-use scenarios should be acknowledged since numerous factors influence future land uses, such as policy commitment and implementation, technical and financial resources, and adequate monitoring and evaluation systems. Last, but not least, it is worth emphasizing the role of integrated and participatory land-use planning in bringing together different non-state and sub-national actors, and in building consensus toward better governance of the landscape. Such functions are key to connecting different levels of government and other stakeholders in the implementation of sub-national activities, and thus deliver national commitments such as NDCs (Hsu et al. 2019).

## 4.5 Conclusions

Our study demonstrates the use of LUMENS as a platform for multi-stakeholder negotiation toward developing a land-use plan that takes multiple ecosystem services in rural Vietnam into account. It provides insights into local engagement in land-use planning processes, its potential impacts on ecosystem service delivery in the landscape, and particularly climate mitigation potential. The study shows that well-facilitated stakeholder engagement can help fill-in current gaps in land-use planning, and can inform national climate policies on how actual emission reductions and sequestration can be achieved on the ground. It also illustrates how the governance of a carbon-rich landscape can be improved with stakeholder involvement in decision-making through

processes such as land-use planning. Finally, the study highlights the roles of tree-based land uses, especially agroforestry, in securing climate change-related targets as well as their co-benefits. National and local authorities should not only acknowledge the role of tree-based land uses in integrated landscape governance, but also use participatory oriented spatial analysis to develop and implement such policies with multi-stakeholder involvement.

## Acknowledgments

This research was funded by the Australian Centre for International Agricultural Research, grant number FST/2016/152; and the research programmes on Forests, Trees and Agroforestry (TFA) and the Policies, Institutions, and Markets (PIM) Programme of the Consultative Group on International Agricultural Research. We thank our colleagues from the World Agroforestry, the Vietnamese Academy of Forest Sciences, and the Soils and Fertilisers Research Institute who provided insights and expertise that greatly assisted the research. We would also like to thank the officials and staff of the Extension Centre of Dien Bien Province, Na Nhan Commune People's Committee in Dien Bien Province, as well as the village leaders for their active participation and support to our field activities. We thank the men and women farmers who openly shared information, their perspectives and insights during the surveys, discussions, and other activities during the study period. Finally, we thank the anonymous reviewers and guest editors of this special issue for their careful reading of our manuscript and their many insightful comments and suggestions.



## **5. Voluntariness and conditionality considerations in developing pro-poor PES at community level in Vietnam**

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The contents of this chapter have been published in Journal of Land Use Science:

Do, T.H., Patton, I., & Catacutan D. (2022). Towards pro-poor and voluntary PES: assessment of willingness to pay and willingness to accept PES contract in central Vietnam. *Journal of Land Use Science*, 17:1, 505-522, DOI: 10.1080/1747423X.2022.2127953

## Abstract

This study employed Contingent Valuation and Discrete Choice Experiment methods to investigate the potential of a Payment for Ecosystem Service mechanism that incentivizes sustainable land use practices by determining the willingness of ecosystem service beneficiaries to pay for delivery of services via adoption of sustainable land use practices by upland poor, ethnic minority communities, and vice versa, the willingness of communities to adopt such practices upstream of Vu Gia river, central Vietnam. From the users' side, 64% and 56% of pooled respondents said they are willing to pay a higher rate for water and electricity consumption, respectively, if upstream watershed management is improved. On the providers' side, WTA was high if the conditionality is relaxed. Our findings suggest a fundamental challenge in designing PES that matches the needs of buyers and providers -- a scheme that ensures ecosystem service flows but does not impose stringent rules that limit stakeholders' participation.



## 5.1 Introduction

While terrestrial biodiversity and ecosystems have been continuously threatened, neoliberalisation of biodiversity and ecosystem conservation offers opportunities to mobilise resources (financial, human and technical) from various sources for conservation. Many schemes have been tried with some certain successes (and failures) including market-based incentive instruments, tradable permits, REDD+, debt for nature swap, and payment for ecosystem services (PES) among others (Anderson et al., 2010; Bigger and Dempsey, 2018; Thomas & Theokritoff, 2021). Among them, PES has been fast growing as a promising solution to provide conditional incentives that motivate land-users to adopt environmentally beneficial land use practices (Farley & Costanza, 2010; Kaczan et al., 2013). The PES concept varies widely, from the narrow definition of Wunder (2005) that “PES is a voluntary transaction where a well-defined ES (or land-use likely to secure that service) is being bought by a buyer from a provider, if and only if the provider secures ES provision (conditionality)”, to the broader concept of Muradian et al. (2010) who defined PES as “a transfer of resources between social actors, which aims to create incentives to align individual and/or collective land use decisions with the social interest in the management of natural resources”. While Wunder’s definition of PES is strictly neoliberal (Büscher et al., 2014), implementation in developing countries deviates significantly from this definition (Fletcher & Breitling, 2012; Muradian et al., 2013; McElwee et al., 2014; Fletcher & Büscher, 2017). Indeed, most PES implementation are run by states, non-market, and often in the form of subsidies (Gómez-Baggethun & Muradian, 2015). The neoliberalisation of biodiversity and ecosystem conservation is often critiqued for its “commodification of nature” (Kopnina, 2017), narrowing human-nature relationship (Kolinjivadi et al., 2019), lack of marketability of ecosystem services (Landell-Mills & Porras, 2002), and ignorance of ecological, social, or spiritual values as

separate from an income dimension (Kolinjivadi et al., 2014). Some suggest that government intervention, or even direct administration, is needed for PES to deal with complexity of natural resources management and ensure environmental function (Wang & Wolf, 2019; Gao et al., 2020). As a result, PES and local pre-existing systems in conservation and resources management are often combined into a hybridized structure (Fletcher & Breitling, 2012; McElwee et al., 2020, Kaiser et al., 2021).

Vietnam is an interesting case to see how “theoretical” neoliberal conservation via PES breaches into a country, given its long history of socialism and command-and-control approach in forest governance. In 2010 a national policy on payment for forest ecosystem services (PFES) was initiated. Vietnam’s PFES takes the broad definition of PES wherein beneficiaries of the ES (e.g. hydropower companies) indirectly and obligatorily pay owners of the forest land that provide the ecosystem services. With the issuance of Decree 99/2011, the PFES policy is regarded as the nation’s only working PES mechanism (Do et al., 2018). Under Decree 99, ES users are hydropower enterprises, water supply companies, and eco-tourism businesses, while ES sellers/suppliers are forest owners who manage the forests, management boards of protected and special-use forests, individuals, forest companies, and local organisations with forest land titles. However, most hydropower plants, water supply companies and tourism operators, although called ES users, only simply act as fee collectors or intermediaries that pass the fees from one party to the next (their customers who consume electricity, water and tourism services). Many authors including Pham et al. (2013) and Phan TQH (2019) found that most end users were not aware of the PFES payment part in their electricity and water bills, and information exchange between end users and their suppliers are very limited.

A fixed rate of PFES payment has been applied. At the time of this study, hydropower enterprises pay VND 20 (USD 0.001) per KWh for commercially-produced power, while water supply companies pay VND 40 (USD 0.002) per cubic metre of produced clean water, and eco-tourism businesses pay 1–2% of their revenue<sup>24</sup>. All transactions are made through the Viet Nam Forest Development and Protection Fund (VNFF), the agency mandated to collect and distribute ES payments. In this indirect payment mechanism, any negotiation or contact between sellers and buyers is simply out of necessity. Despite being mentioned in Decrees 99/147/156, direct payment (implying voluntary PES) was never elaborated in policy documents (Do et al., 2018). For the Vietnamese government, the PFES programme has helped in successfully raising over US\$ 100 million annually for forest protection with proxy indicators on environmental performance such as decreased area of forest loss (McElwee et al., 2020). The PFES programme has been criticised for its reverse decentralisation of state forest governance (Suhardiman et al., 2013), avoidance of voluntary negotiations (Kolinjivadi & Sunderland, 2012; Do et al., 2018), largely excluding rightful beneficiaries (To & Dressler, 2019), and lack of conditionality and monitoring systems to report on outcomes (Pham et al., 2015). Nevertheless, few studies report on making the PFES more voluntary and performance-based (Simelton & Dam, 2014; Do et al., 2018; Nielsen et al., 2018; McElwee et al., 2020). While we partly agree with some authors including Roth & Dressler (2012), Suhardiman et al. (2013) and McElwee et al. (2020) that the non-neoliberal parts of PFES are influenced by a history of socialist development, we believe that neoliberalisation is a process, not an outcome, since any governmentality must be continuously reproduced or re-enacted (Kolinjivadi et al., 2019), and thus PFES can be improved towards more

<sup>24</sup> These rates of payment are regulated in Decree 99/2010/ND-CP of the Government issued in 2010. By the end of 2018, the Government issued Decree 156/2018/ND-CP that regulate payment rates as VND 36 per KWh of electricity and VND 52 per cubic metre of produced clean water.

fair, market-oriented scheme without being completely neoliberal (Kaczan et al., 2013). Our study does not aim to engage in the endless neoliberal versus non-neoliberal debates, but rather on generating empirical evidence for negotiating a voluntary, performance-based PES, which policy-makers can use to improve the existing PFES program. It contextualises a hypothetical PES scheme wherein current PFES users may want to further secure ES supply by paying extra amount to upland communities who may want to adopt sustainable land use practices with conditional incentives – and, unlike the PFES, the hypothetical scheme involves direct and voluntary transactions. Our study complements existing PFES literature because (1) we employed contingent valuation (CV) and choice experiment (CE) to quantify buyers' and suppliers' preferences for a PES design, not just to value ES; and (2) we expanded the scope of PES to include sustainable land use practices (e.g. agroforestry) outside natural forests that have already been covered by PFES, thus avoiding overlap while still promoting income generation and ES delivery by farmers.

## 5.2 Materials and methods

### 5.2.1 Study sites

#### 5.2.1.1 WTA study site - Phuoc My and Ta Binh communes, Quang Nam province

Phuoc My and Ta Binh communes are located in the buffer zone of Song Thanh Natural Reserve (STNR) in Quang Nam province (Figure 5.1). The two communes lie in the valley of Central Anamite range. Agricultural land in the two communes were small compared to total land (<3% in Phuoc My and <16% in Ta Binh). Phuoc My had 1,590 people belonging to the Gie Trieng (Bhnonng), Kinh, Tay, Nung, Co Tu ethnic groups (2014 statistics). Ta Bhing had 2,438 residents, predominantly belonging to the Ca To ethnic

group. In terms of socio-economic status, 50% of households in Phuoc My were poor, 24% near-poor and 26% non-poor, while in Ta Binh, the figures were 64%, 18% and 18%, respectively (Catacutan et al., 2017).

Soil and water conservation technologies were rarely practiced in both communes, resulting in moderate to severe soil erosion. Farming has been affected by drought, heavy rain and storm, flooding, landslide and soil erosion. Although restricted by STNR management authorities, agricultural expansion has ensued furtively.

The quality of natural forests has declined after years of overexploitation. Timber and NTFPs were depleted. Few farmers obtained benefits from their forests besides firewood, medicinal plants and mushroom. Farmers wanted to plant fast-growing trees for the pulp and paper industry. Households from several villages in Phuoc My earned income from the PFES program, while this was the case for only one village in Ta Binh. Paddy and upland rice remain the main agricultural crops in both communes.

### 5.2.1.2 WTP study site - Da Nang city

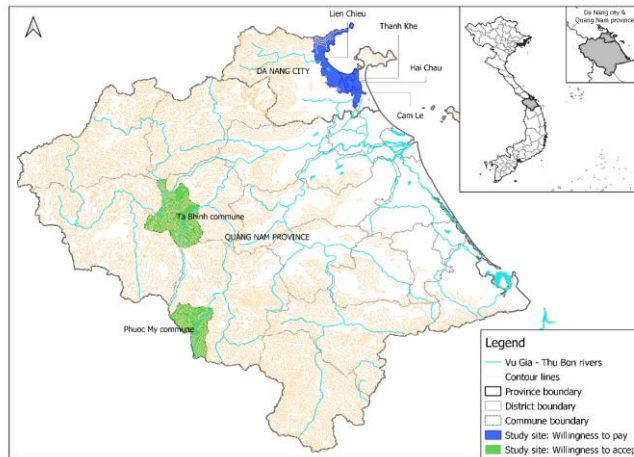
With 1.1 million people, Da Nang is the sixth most populated city in Vietnam and had the highest urbanisation ratio among provinces and municipalities in Vietnam. Around 87% of population live in urban areas with an average annual urban population growth of 3.5%<sup>25</sup>.

Da Nang city (Figure 5.1) has a total area of 1,285 km<sup>2</sup>, lying on the coast of the South China Sea and downstream of the Vu Gia-Thu Bon rivers<sup>26</sup>. Water demand for millions of residents and tourists is projected at 500,000 m<sup>3</sup>/day by 2025 (ADB, 2012). The main water source is Cau Do River, which relies on water from the Vu Gia River. Da Nang's water supply has declined in recent years due to upstream forest destruction, low

<sup>25</sup> [Da Nang | ESCAP \(unesco.org\)](https://unesco.org/)

<sup>26</sup> *ibid*

rainfall and hydropower operations. It is also suffering from salt-water intrusion and fresh-water shortage. Since Da Nang could not control the intake of water, and the flow of Vu Gia River has been unstable, it is urgent for residents to negotiate with upstream land holders in Quang Nam province to rehabilitate the Vu Gia watersheds.



**Figure 5. 1 Study sites in Quang Nam province and Da Nang city**

## 5.2.2 Methods

### 5.2.2.1 Contingent valuation method to assess WTP

Contingent valuation method (CVM) is a widely used economic tool for measuring the maximum WTP of potential users for an environmental good or service (Wedgwood & Sansom, 2003). The tool relies on two key assumptions: (1) people have well-ordered, but concealed, preferences for all types of environmental goods; (2) people are capable of transforming preferences into monetary values (Hoevenagel, 1994). The method can include either open- or closed-ended questions. We used a close-ended CVM to estimate households' WTP for improved management of watersheds in and around STNR. Four districts in Da Nang city were surveyed---Hai Chau, Cam Le, Lien Chieu, and Thanh Khe. Their populations benefit from Da Nang Water Supply Company and are therefore ES beneficiaries of STNR watersheds.

### Sampling procedure and survey

Questionnaires were administered to 203 randomly selected households by trained CVM enumerators, consisting of six parts: (1) Study purpose; (2) Socio-demographic information; (3) Current water/electricity supply situation, consumption behaviors, awareness level, attitude towards nature; (4) Contingent valuation market scenario; (5) WTP (dichotomous choice); and (6) Alternative solutions (more details provided in [Annex 5](#)).

Steps 4 and 5 were repeated twice—first to determine the WTP per unit of water, then again per unit of electricity. At the end of each WTP section, respondents could provide comments on their decision and suggest alternative solutions to shortages. Twenty HHS were pre-tested to gauge interviewees' awareness about the watershed and to calibrate the final bid amounts.

### Bid Amounts

A close-ended, dichotomous choice format was used to determine if respondents are willing to pay a certain amount (the starting bid) for improved management of Vu Gia river basin. For a “Yes” response to the first bid, participants were offered a second higher bid while a lower bid is offered to a “No” response. The final bid amounts were VND 10, 30, 60, 90, 120, 150, 170, and 300 per kWh of electricity, and VND 50, 70, 90, 110, 130, 150, 170 and 500 per m<sup>3</sup> of water. The VND 300/kWh and VND 500/m<sup>3</sup> bids were used to control for acquiescence response bias.

### Data Analysis

SPSS was used to perform truncated tests at 5% significance level for correlations between respondents' WTP and selected variables. Descriptive statistics and cross-tabulations between the percentage WTP and select variables were also conducted.

#### **5.2.2.2 Discrete choice experiment (DCE) to assess WTA**

Discrete choice experiment (DCE) belongs to a class of quantitative techniques that are based on stated preference (SP) - an individual's preferences for "alternatives" (whether goods, services, or courses of action) expressed in a survey context (Louviere et al., 2010). DCE is based on the random utility theory (RUT) proposed by Thurstone (1927), which has been expanded to multiple comparisons (McFadden, 1986; Midway et al., 2020). This method has been widely applied in PES studies (Kaczan et al., 2013; Chaikaew et al., 2017; Khan et al., 2019). Using DCE in evaluating farmers' WTA in the two selected communes was due to several reasons: (1) In the absence of a real-world situation, SP method is required; (2) in WTA application, DCE is less prone to bias than other stated choice methods (Burton, 2010); and (3) DCE is relatively simple and less likely to cause cognitive burden to respondents (particularly those with lower literacy).

#### Defining attributes and attribute levels

Prior to this study, we conducted a baseline study in the buffer zone of STNR and found agroforestry models (like intercropping and home gardens) that could maintain some degree of ecosystem functionality while allowing for agricultural production and income generation in the buffer zone. Such models can provide carbon sequestration services and biodiversity (above and below ground) comparable to regenerated forest, and contribute to better surface flow regulation (Catacutan et al., 2017). Although inferior to original forest, maintaining agroforests can offset forest cover loss. Yields and subsequent profits are estimated to be higher than those from baseline practices although there are investment requirements in both financial and management aspects (Catacutan et al., 2017). Regardless of the exact profit differences however, it is likely that long term maintenance of improved agroforestry requires providing farmers with additional incentives above the profits that are already associated with this farming method. The hypothetical PES programme is focused on this goal: farmers would receive



rewards (in cash and in kind) if they establish and maintain agroforestry plots that would help to generate ES benefits to downstream water and electricity users.

We initially identified relevant attributes to farmers' decision and sustainable land use practices, including land area subscribed to the program, land use types, upfront payment amount, tree density, level of technical support, preferential loan provided, monitoring and reporting methods, contract duration, annual payment, individual/collective payment, fund management, farmers' in-kind contribution, exit option, etc. A choice set was developed for field testing to narrow the choice experiments and define attributes that most influence farmers' decision-making. Thirty farmers participated the pre-test wherein farmers preferred individual payment, while contract length held very marginal effect on their decision. Farmers also revealed concerns on their technical capacity during the test. Accordingly, we adjusted the attributes as shown in the final set in [Annex 6](#).

#### Questionnaire development and design

Responses in a DCE can take on different formats including 'pick-one', 'best-worse', and others. We applied 'pick-one', as this is similar to real life decision making. A three-alternative design was adopted, wherein each choice set included three options for respondents to choose from. The alternatives in our DCE were unlabeled ([Louviere et al., 2000](#)) with generic titles (options A, B and C). A 'none' option (Status quo) was included to reflect unconditional demand and thus, ensure conceptual validity of the design given the voluntary nature of farmer participation in PES. Most upstream farmers were observed to have relatively low education level and unexposed to multiple-choice situations. To collect as much information without imposing the cognitive burden of answering many choice sets, nine choice sets were then used. These choice sets ([Annex 7](#)) were introduced to farmers as a hypothetical PES program.

### Survey administration

The survey took place in all villages of Phuoc My and Ta Bhing, involving 235 respondents. To facilitate communication in local languages, up to eight enumerators (i.e. forest rangers, commune officers) were employed in each meeting. Respondents' information is given in [Table 5.1](#) below.

**Table 5.1 DCE survey administration. Source: author's data**

	Phuoc My commune	Ta Bhing commune
Number of respondents	87 (~90% female)	148 (~60% female)
Average age of respondents	35	40
Average respondents' number of years at school	6.2	6.3

In each village, households were gathered in the “Guol” – a village hall. The meetings started with questions about village land uses, followed by the introduction of the hypothetical PES program. Each household representative made his/her choices individually and answered exit questions with the help of enumerators.

### Data analysis

Choice experiment design and data analysis were performed using SAS's JMP Statistical Discovery software version 11.0.0 ([SAS Institute Inc., 2013](#)). The software used a special default bias-corrected maximum likelihood estimator described by [Firth \(1993\)](#). The choice statistical model is expressed as:

Let  $X[k]$  represent a subject attribute design row, with intercept

Let  $Z[j]$  represent a choice attribute design row, without intercept

Then, the probability of a given choice for the  $k^{\text{th}}$  subject to the  $j^{\text{th}}$  choice of  $m$  choices is expressed in equation (5.1) below:

$$P_i[j|k] = \frac{\exp(\beta'(X[k]) \otimes Z[j])}{\sum_{i=1}^m \exp(\beta'(X[k]) \otimes Z[i])} \quad (5.1)$$

here:

- $\otimes$  is the Kronecker row-wise product
- the numerator calculates for the  $j^{\text{th}}$  alternative actually chosen
- the denominator sums over the  $m$  choices presented to the subject for that trial

## 5.3 Results

### 5.3.1 Contingent Valuation Method – Willingness to Pay

#### 5.3.1.1 Perceptions of the environment and awareness of watershed services

Questions around two variables of the New Ecological Paradigm, namely stewardship of nature and mastery of nature were used to gauge respondents' vision of the relationship between humans and nature (Dunlap et al., 2000; de Groot et al., 2011). 86.7% of respondents strongly agreed that technological progress would enable humans to solve future environmental problems, illustrating why respondents were willing to invest in watershed management, and nearly all (95.1%) strongly agreed that humans are responsible for conserving the environment for future generations (Table 5.2). Nearly all respondents were aware of the connection between upstream watershed management and downstream water supply, and most were aware of STNR itself. Such high awareness is likely explained by respondents' relatively high educational level

(53% of respondents finished at least highschool, 33% were university graduates, 5% had no formal schooling, and 9% chose not to reveal their educational level).

**Table 5. 2** Awareness and perceptions of respondents. Source: authors' analysis

Variable	Response	Frequency	Percentage (%)
Stewardship of Nature (*)	Strongly agree	193	95.1
	Agree	10	4.9
	Total	203	100
Mastery of Nature (**)	Strongly agree	176	86.7
	Agree	26	12.8
	Total	203	100
Song Thanh Nature Reserve	Aware	119	58.6
	Unaware	84	41.4
	Total	203	100
Relationship between water catchment management and water supply	Aware	193	95.5
	Unaware	9	4.5
	Total	202	100

Note: (\*) Stewardship of Nature: perception of human-nature relationship wherein Human beings have a responsibility to conserve the natural environment, and although we stand above nature, we do need to take good care of it; (\*\*) Mastery of Nature: perception of human-nature relationship wherein human beings have the right to alter nature radically and technological progress will enable us to solve environmental problems in the future (de Groot et al., 2011).

Majority of respondents felt their current utility supply is sufficient (85% and 84% for water and electricity, respectively). Yet, approximately 48% of respondents reported having water and/or electricity shortages in the last 6 months. This inconsistency is likely because the city's water supply in current year was relatively stable compared to the intense rationing and alarm raised in previous years (Table 5.3).

**Table 5. 3** Respondents' rating of water and electricity sufficiency and experience with shortage in the last 6 months. Source: authors' analysis

Variable	Response	Frequency	Percentage (%)
Water supply	Sufficient	171	85.5
	Insufficient	29	14.5
	Total	200	100
Water shortage	Shortage	88	48.6
	No shortage	93	51.4
	Total	181	100
Electricity supply	Sufficient	165	84.2
	Insufficient	31	15.8
	Total	196	100
Electricity shortage	Shortage	87	48.1
	No shortage	94	51.9
	Total	181	100

### 5.3.1.2 WTP

Ten variables were tested for their association with Da Nang residents' WTP. Water shortage experience and insufficient supply in the last 6 months and average monthly water consumption were linked to the residents' higher WTP (Table 5.4), while electricity WTP was correlated with electricity shortage and average monthly water consumption (Table 5.5). With regard to electricity, respondents were willing to pay more if they had experienced electricity shortages in the past 6 months. Further cross-tabulations confirmed no significant associations between gender, age, level of education, or other variables in the residents' WTP for water and electricity. For both water and electricity, the higher the respondent's monthly consumption, the higher their WTP becomes. In this scenario, the level of consumption might be a proxy for income level--- presence of higher disposable income could thus be linked to the residents' WTP for watershed protection measures.

**Table 5.4** Correlation analysis of variance for water WTP. Source: authors' analysis

Variable	Pearson coefficient	p-value
Age	-.116	.190
Gender	.065	.461
Highest level of education	.147	.101
Mastery of nature	-.159	.070
Average water consumption**	.314	.000
Water shortage**	.271	.004
Water sufficiency**	-.175	.047
Awareness of the Song Thanh Nature Reserve	.170	.052
Average electricity consumption	-.125	.171
Number of years lived in Da Nang	-.075	.396

\*\* indicates significant variables

**Table 5.5** Correlation analysis of variance for electricity WTP. Source: authors' analysis

Variable	Pearson coefficient	p-value
Age	-.138	.144
Gender	.044	.645
Highest level of education	.183	.056
Mastery of nature	-.275	.003
Average water consumption**	.276	.003
Electricity shortage**	.353	.000
Electricity sufficiency	-.179	.062
Awareness of the Song Thanh Nature Reserve	.036	.701
Average electricity consumption	-.158	.105
Number of years lived in Da Nang	-.171	.069

Note: Significance tests at 5% level (\*\* indicates significant variables)

Sixty-four per cent of pooled respondents said they would be willing to pay a higher rate for water to improve upstream watershed management, whereas 56% were willing to pay higher electricity rates. Buyers were likely less willing to pay more for electricity than water because current electricity rates were perceived as already being too high (Tables 5.6 and 5.7). Thirteen respondents said they were not willing to pay higher

prices because they could not afford to, especially for electricity which is already too high. Interviewees also did not elicit a WTP because they doubted the effectiveness of the proposed watershed management solution or did not prefer the PES financing mechanism. Overall, buyers expressed that they would be more willing to pay if there will be better monitoring and reporting.

**Table 5. 6** Percentage distribution for bid amounts of respondents who elicited WTP for water. Source: authors' analysis

Bid (VND)	Number willing to pay	Percent WTP (%)
50	131	100
70	118	90.08
90	101	77.10
110	90	68.70
130	49	37.40
145	26	19.85
150	25	19.08
170	12	9.16
210	2	1.53
500	1	.76
Pooled	131	<b>64.53</b>

**Table 5. 7** Percentage distribution for bid amounts of respondents who elicited WTP for electricity. Source: authors' analysis

Bid (VND)	Number willing to pay	Percent WTP (%)
10	114	100
30	112	98.26
40	98	85.96
60	97	85.09
90	87	76.32
100	46	40.35
120	45	39.47
130	20	17.54
150	19	16.67
170	9	7.89
190	2	1.75
300	1	.88
Pooled	114	<b>56.16</b>

Of the respondents who elicited a WTP, the mean WTP was 113.24 VND/m<sup>3</sup> and 98.07 VND/kWh for water and electricity, respectively (Table 5.8), which is a positive sign for exploring a voluntary PES mechanism.

**Table 5.8 Mean truncated WTP of respondents (in VND) per unit of electricity and water. Source: authors' analysis**

	Number	Minimum	Maximum	Mean	Std. Deviation
Electricity WTP	114	10	300	98.07	44.758
Water WTP	131	50	500	113.24	48.544
Valid N (list wise)	114				

### 5.3.1.3 Alternative solutions

The final part of the survey was an open-ended question about solutions to water shortage (Table 5.9). Sixteen respondents recommended improving supplier management (e.g. controlling corruption, increasing transparency) , 12 posited technological solutions (e.g. solar power, water-efficient appliances), 11 suggested improving natural resources management (e.g. preventing illegal logging and improving forest management), and 3 proposed better end-user management (e.g. awareness raising).

**Table 5.9 Alternative solutions to water and electricity shortages. Source: authors' analysis**

Alternative solutions	Frequency	Percentage (%)
Improve natural resource management	10	4.9
Improve supplier management	16	7.9
Improve end-user behavior/mgt	3	1.5
Technological solution	12	5.9
Total	41(*)	20.2

(\*) Only 41 respondents provided answers on solutions to water and electricity shortage



### 5.3.2 Discrete Choice Experiment -- Willingness to Accept

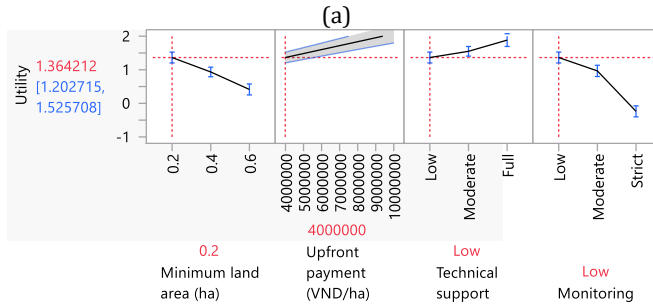
#### 5.3.2.1 General WTA

We employed the Discrete Choice Experiment (DCE) in determining the attributes that explain farmers' utility (WTA) toward the hypothetical PES contract. The most significant attribute was *monitoring level*, followed by *minimum land area*, *upfront payment*, and *technical support* (Figure 5.2a). Predictably, both *monitoring level* and *minimum land area* negatively affected WTA wherein, an increase in the *level of monitoring* and *land area requirement* would decrease farmers' WTA, while *upfront payment* and *technical support* showed positive impact, which means that an increase in these attributes would motivate farmers' WTA (Figure 5.2a). All of the effects were significant<sup>27</sup>. However, the impact of technical support was only marginal compared to other attributes, meaning that farmers' WTA would only increase very slightly with more technical support (Figure 5.2b). The multinomial logit models of preferences for a hypothetical PES programme is shown in Annex 8.

The effects of changing the attribute levels were linear except for *monitoring level* (Figure 5.2c). Increasing upfront payment and technical support, or decreasing the minimum land area subscribed to the PES programme elevated farmers' WTA level proportionally. However, WTA dropped sharply with a change in the *monitoring level* from moderate to strict, while a change from low to moderate *monitoring level* did not significantly affect farmers' WTA. Farmers WTA was 1.36 when all attributes are at minimum level, and changed to .97 and -.24 when the *monitoring level* changed to moderate and strict. The marginal effects of each attribute on farmers' decision are shown in Figure 5.2c.

<sup>27</sup> i.e. probability > Chi-square is less than 0.001 for all attributes

	L-R ChiSquare	Prob>ChiSq	
Minimum land area (ha)	176.517	<.0001*	
Upfront payment (VND/ha)	97.878	<.0001*	
Technical support	64.579	<.0001*	
Monitoring	505.571	<.0001*	



(b)

### Effect Marginals

Marginal Probability	Marginal Utility		Minimum land area (ha)
0.4909	0.46015		0.2
0.3194	0.03028		0.4
0.1897	-0.49042		0.6
Marginal Probability	Marginal Utility		Technical support
0.2573	-0.23520		Low
0.3100	-0.04920		Moderate
0.4327	0.28441		Full
Marginal Probability	Marginal Utility		Monitoring
0.5339	0.66689		Low
0.3586	0.26898		Moderate
0.1075	-0.93587		Strict

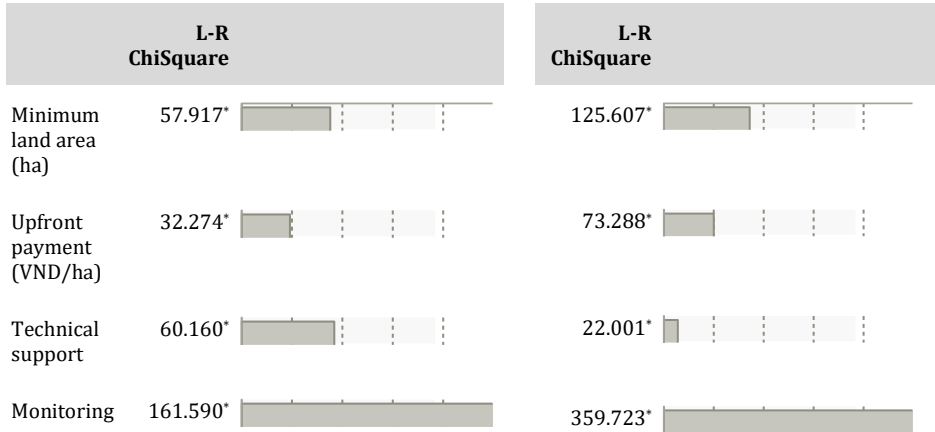
(c)

**Figure 5.2** Effects of attributes on respondents: (a) relative magnitude of effects; (b) effect of each attribute on WTA; (c) marginal effects. Source: author's analysis

### 5.3.2.2 Site differences

Given the very similar natural and socio-economic conditions of the two communes, heterogenous impacts of attributes on respondents' choice were not expected. We found that farmers in Phuoc My were more strongly motivated by *technical support* than in Ta

Bhing (Figure 5.3). This is likely because most of the respondents in Phuoc My have already been involved in the PFES programme and may have realised the technical difficulties in implementing activities (Catacutan et al., 2017).

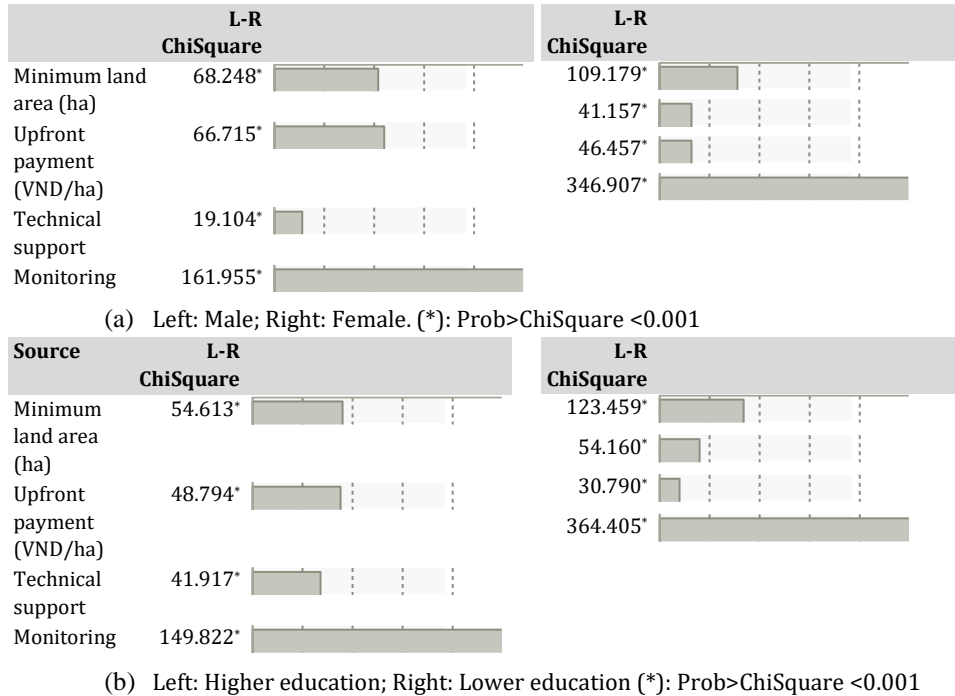


**Figure 5.3** Effects of attributes on WTA of respondents in Phuoc My (left) and Ta Bhih (right). Source: author's analysis

### 5.3.2.3 Gender and literacy differences

The most significant difference between gender groups was found in the upfront payment. The male group preferred a higher upfront payment, which corroborates with earlier findings of a REDD+/PES study in Bac Kan province wherein men were more cash-oriented than women (Eastman et al., 2012). The female group's WTA was much more strongly influenced by monitoring level and minimum land area (Figure 5.4a). Female's WTA decreased more sharply as land area or monitoring level increases. This result concurs with some behavioral economics studies concluding that women are psychologically more risk averse than men (Croson & Uri, 2009). In terms of literacy level, upfront payment and technical support had stronger effects on people who attended high school or above compared to those with lower education (Figure 5.4b). It is assumed that respondents with higher education (thus presumably higher literacy

level and skills) had better cognitive ability (Barnes et al., 2004; Kravchenko, 2021), and therefore could realise the full picture of the hypothetical PES contract rather than focusing on one or two “perceived” important factors.



**Figure 5. 4 Effects of attributes on WTA: (a) Male and female groups; (b) lower and higher education groups. Source: author's analysis**

### 5.3.2.3 Status quo

The status quo (SQ) or no-choice option is a scenario where no action is taken. Twenty-four people (10% of total respondents) had at least one SQ taken. The total number of SQ option taken was 60 (2.8%) from the total number of choices made. Only one person took SQ options in all nine choice sets given. This was not a protest response, but the person was observed to be unsure about his understanding of the hypothetical scenarios. His response is unlikely a reflection of his true WTA, but rather the result of avoidance of choice due to confusion or complexity (Barreiro-Hurle et al. 2018).

## 5.4 Discussions

### 5.4.1 Implications of WTP and WTA to PES participation and voluntariness

In terms of WTP, surveyed residents present a high degree of environmental awareness. The majority was willing to pay for improved watershed management; 64% were willing to pay more per m<sup>3</sup> of water, and 56% were willing to pay more per kWh of electricity. Understandably, those willing to pay more have experienced recent shortages. Buyers may have been quicker to rate their electricity supply as sufficient because, compared to water, electricity was not rationed.

While respondents elicited a WTP through a surcharge on both water and electricity bills, it is advised that the PFES policy to be amended to allow inter-province negotiation on increasing buyers' payments through their water bills only. This is because water supply can be directly traced from the catchment to the water supplier, then to consumers. For electricity, the water can only be traced from the catchment to the HPP supplier because electricity is distributed to different regions; hence, Da Nang City residents could not be assured of stable power supply by their regional HPPs, and the ES would leak to non-paying beneficiaries in other regions.

The high WTA of respondents in Phuoc My and Ta Bhing corroborates with other study results that cash payment is not always the most important factor for rural communities to adopt conservation and new farming practices (Adhikari & Boag, 2013; Zanella et al., 2014; Costedoat et al., 2016, Lliso et al., 2022). In many cases found in the literature, cash payment is less preferred, especially when the villages are poor and have limited market access (Hoynes & Schanzenbach 2009; Norden, 2014). In our study, the upfront investment per unit area (one ha), which is USD 200 ha<sup>-1</sup> was sufficient to trigger participation when other factors were unfavourable. This amount was less than half of

the establishment cost of an agroforestry plot, so it is possible that respondents either did not consider or had no idea about the establishment or opportunity costs involved. Another possibility is that the expected benefit from the investment was high, superseding the value of the input itself. However, a high WTA could also reflect rural communities' tendency to say "yes" to an external agent, although we tried to minimise this notion by being open about our intention.

We also found that preferences in the WTA were somewhat homogenous. Differences between gender, literacy, and commune existed, but were not significantly high to be categorized into discrete classes and treated differently. In other words, a voluntary PES programme can be applied uniformly throughout the population of Phuoc My and Ta Bhing.

The main difference between our hypothetical PES scheme and the national PFES is that while participation in the latter is compliant, the former is voluntary. In PFES, ES users are "charged" by the policy, while suppliers enjoy payments through labour contracts with legal forest holders (mostly state-owned forest entities). Some of the risks to PFES relate to motivational crowding out—for example, the way local people received daily wages (often representing instrumental values of ecosystem services) for forest patrolling could potentially undermine their willingness to protect forests for relational and intrinsic values and discourages sustainable land management activities that provide economic and ecological benefits. Consequently, they are considered passive participants in the PFES programme, and had no role in decision-making (Hoang et al., 2021). It is evident that upstream-downstream payment programmes that ignores relational and intrinsic values will likely have less participants and could even threaten those values by reducing access to traditional lands (Arias-Arévalo et al., 2017; Bremer et al., 2018; Lliso et al., 2022). This motivation crowding out effect is often a result of

non-participatory, top-down approach, not aligned with personal development, elite capture, individual payments conservation tasks, and commodification, among others (Ezzine-de-Blas et al., 2019), and should be well considered in PES design and implementation. A voluntary approach makes the PES scheme more socially acceptable than the government's regulatory approach (Kolinjivadi & Sunderland, 2012), and helps to avoid potential conflicts associated with mandatory regulations (Lindhjem & Mitani, 2012). Our case study presents a clear opportunity to engage stakeholders more actively in securing downstream water supply and developing agroforestry upstream through a PES scheme without creating an artificial ES demand through regulatory administration. It lends lessons and better understanding on designing tailor-fitted PES schemes that incentivize upland poor communities to adopt sustainable land use practices at a payment level that downstream buyers can readily afford, while local concerns are specified and addressed (Wang & Wolf, 2019).

#### 5.4.2 Conditionality in context

While the neoliberal nature of PES is broadly contested, conditionality is considered the core feature that makes PES a novelty as opposed to command-and-control and other non-coercive conservation approaches (Sommerville et al., 2009; Kaczan et al., 2013; Wunder, 2015). In his revised PES definition, Wunder (2015) emphasized conditionality as the single most important PES feature, while voluntariness can be a preserved criterion. Conditionality ensures payments can actually result in positive outcomes on landowners' behaviour and the ES (Sommerville et al., 2009). On this premise, van Noordwijk & Leimona (2010) identified four PES types with decreasing levels of conditionality (I-IV). Level I is where payment can be linked to actual improvement of ES, and IV is when farmers are evaluated against their commitments to implementing management plans favouring ES. Voluntariness of ES suppliers is arguably

disproportional to conditionality: the higher level of conditionality, the heavier the burden on local land managers, and vice versa. Preferences of PES stakeholders, especially suppliers are therefore assumed to be heavily influenced by conditionality (Kaczan et al., 2013).

In our study, level of conditionality was found a limiting factor to participation of poor communities, conforming the studies of van Noordwijk & Leimona (2010), To et al., (2012), Kaczan et al. (2017), and Loft et al. (2019). This is a fundamental challenge in developing a voluntary PES scheme wherein WTA was high at low monitoring level (low conditionality), while WTP varied from low to moderate if high conditionality was required. In general, farmers are likely to participate in a programme that accounts for their actions but not the environmental outcomes because the latter is more difficult to comply (Kaczan et al., 2013). The strong effect of monitoring level to farmers' WTA could be also explained by farmers' skepticism towards a foreign land use (e.g., agroforestry). Since respondents were unsure about outcomes, they wanted to try agroforestry in the smallest area possible first, to reduce the risk of failure or observe the benefits. We posit that if the communities have sufficient experience on sustainable land use practices e.g., agroforestry, their preferences would be less about "afraid of failure" as reported in the literature (Costedoat et al., 2016). The impacts of low and medium level monitoring (representing conditionality in this case) were not much different. Therefore, a future PES scheme can employ a moderate monitoring level based more on trust amongst community members than physical inspection of compliance. Instead of a strict monitoring scheme, a high-level technical support can be provided to help farmers, especially poor farmers with low educational attainment to fulfil their contractual obligations.



### 5.4.3 Moving towards voluntary, pro-poor PES scheme that addresses both conditionality and voluntariness

The PFES policy appears to embody the notion of Compensation for Opportunity-Skipped (COS) ([van Noordwijk & Leimona, 2010](#)). However, the low payment rate failed to address the opportunity costs of unfriendly forest uses, especially forest land conversion to agriculture ([Lan et al., 2013](#); [Pham et al., 2015](#)), and has undermined legitimacy and effectiveness. Even with increased payment, the current language, “payment” would not likely halt timber and NTFP exploitation because forest dwellers are paid for “not doing harm” (e.g., do not cut forest) rather than “actively doing good things” (preserve and enhance the actual ES). The regulatory nature of PFES thus, inhibits participation (especially those without legal tenure rights) and information exchange between stakeholders. Participation in PFES is by default (as perceived) an obligation than an option, where information flow is lacking, awareness of rights and responsibilities are questionable, and non-participation in decision making is common ([Lan et al., 2016](#); [Le et al., 2016](#); [Thuy et al., 2016](#)). The PFES was also criticised for poorly managed conditionality partly due to ineffective monitoring, reporting and verification ([McElwee et al., 2020](#), [Trieu et al., 2020](#)).

Results from our WTP and WTA studies provide a basis to shift from the COS type of PES to a Co-investment in landscape-stewardship (CIS)---a pro-poor PES that aims at enhancing capacity and responsibilities of local communities in conjunction with external financial rewards to achieve desired economic and environmental goals in a stepwise manner: conditionality is enhanced through trust-building, giving attention to non-monetary rewards that enhance the providers’ capacity such as technical training, conditional land tenure, and involvement in decision-making ([van Noordwijk et al., 2010](#); [Lliso et al., 2022](#)). This way of PES framing (stewardship) embraces both relational

and (partly) instrumental values, is fairer (because it recognizes the multiple ways that various social actors perceive the environment values), is more likely to cause motivational crowding-in, and thus ensure sustainability of the payment (Arias-Arévalo et al., 2017; Lliso et al., 2022).

The CIS-PES offers opportunities to include multiple perspectives in managing agroforestry-mosaic landscapes, which have been neglected by policymakers and PES-buyers who consider ES-benefits primarily from forests only. Given the lower conditionality included, attention should be paid to build public trust in the management of upstream natural resources and ES providers. The government should also be attentive to balancing the needs of providers who are often poor communities, with the users' desire to secure ES supply.

#### **5.4.4 Options for policy and practice**

Our study provided evidence on how ES users and providers make choices around ES management. It also shows the potential of a pro-poor CIS-PES, which is a more socially acceptable way to manage the exchange of natural and financial capitals between two sides. Direct and voluntary payment was mentioned in Vietnam's PFES policy but progress in this direction is slow. Our key argument is that although financial sustainability has been easily secured via the regulatory-oriented PFES where taxes and fees are main funding sources, public-private partnerships can also result in tailor-fitted, self-sustaining PES schemes through direct transactions between local stakeholders for the ES of utmost concern. Such opportunity for pro-poor CIS-PES can only emerge if the Government shifts its role from being a regulator (as in the current PFES) to an enabler, creating the conditions for voluntary PES schemes and facilitating their implementation. This approach will potentially make a headway in the transformation of PFES in Vietnam.

## Acknowledgments

This study was supported by the United States Agency for International Development (USAID) (Funding code: 3617 USAD-1177A.01CK 084VNM). We sincerely thank all of those who helped with and involved in the experiments and the two anonymous reviewers who commented on the earlier versions of the manuscript. This work was also supported by the Mekong Region Land Governance project (MRLG). MRLG is a project of the Government of Switzerland, through the Swiss Agency for Development and Cooperation (SDC), with co-financing from the Government of Germany and the Government of Luxembourg.



## 6. Synthesis

## 6.1 Overview

In this concluding chapter, I provide responses to the general research question and the specific research questions framed in the first chapter and explain my contribution to different branches of the scientific literature. Subsequently, I share reflections on the research and point towards directions for future research. I close the chapter with some policy recommendations and concluding remarks.

## 6.2 Responses to general and specific research questions

Payments for Ecosystem Services (PES) is based on a proposition that by providing incentives to resource users for activities that supplement the flow of specified ecosystem services, the environment can be restored or protected. Wunder's (2005, 2007) definition of PES is perhaps most widely used "*A PES scheme is a voluntary, conditional agreement between at least one "seller" and one "buyer" over a well-defined environmental service--or a land use presumed to produce that service*". Wunder (2015) suggested that two criteria help to differentiate PES from pre-existing conservation programmes: *Conditionality* (causal relationship between payment and performance of ES delivery is clearly demonstrated) and *voluntariness* (all stakeholders participate with free and prior informed consent principles applied). A number of PES scholars, including van Noordwijk et al. (2007, 2017) proposed two further criteria: PES should be *realistic* (the trade-offs between ecosystem services delivery and threats to them are well perceived and can be addressed by actors identified for payment/rewards) and *pro-poor* (acknowledging impacts on resource-poor local stakeholders and supporting equity by addressing their priorities). While pro-poor is considered a social dimension of PES, the combination of realistic, voluntary and conditional can be referred to as a 'market' (van Noordwijk et al., 2007).

This doctoral thesis has successfully addressed the general research question of how PFES policy, initially introduced as a neoliberal concept, has been shaped by local context where it situates (Vietnam). It shows that the neoliberal logic to address environmental problem by providing monetary incentives does not necessarily correspond with the views held by PFES participants and is barely translated into PFES implementation. The contextual factors that shape PFES differently to the neoliberal PES (Wunder 2005, 2007, 2015) are found to be political and institutional settings (the top-down state forest governance regime), socio-economic-cultural conditions (relatively weak role of private sector, local social and cultural norms, and the deep-roots of previous state led subsidy programmes in forestry sector), and environmental conditions (some forest environmental services<sup>28</sup> like watershed protection and forest carbon sequestration are not yet ready to be “marketized” by their nature). Moreover, my thesis adds practical evidence to arguments (Maca-Millán et al., 2021; Rasch et al., 2021; Anderson et al., 2022; Barton et al., 2022; Horcea-Milcu, 2022; Gustafsson & Lidskog, 2023; IPBES, 2023) that ‘incentives’ of PES should integrate social exchanges, cultural norms and values, and reflect historical trajectories of state actors that define contextual limits of how PES is implemented and understood (Hecken et al., 2018; Lliso et al., 2022). This argument has a strong implication for the way PES policy is designed and articulated: incentives, if solely characterized as neoliberal would undermine a range of local structured norms and interventions that are social and natural positive.

The following paragraphs provides responses to each research question in more details.

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<sup>28</sup> The forest environmental services indicated by PFES policy in Vietnam are: hydrological services (watershed protection and water supply), scenic/landscape beauty and biodiversity for tourism, biodiversity support (provision of spawning grounds for aquaculture), and climate regulation services (carbon sequestration and retention)

### 6.2.1. Research question 1 – To what extent does the neoliberal PES logic work in Vietnam?

PES policies can conceptually be seen as incentive-based or market-based mechanisms because PES policies rely on incentives for service provision, rather than explicit directives to achieve desired outcomes (Chan et al., 2017). These policies promote payment to individuals or communities to undertake actions that increase levels of desired ES. A large number of PES initiatives have emerged around the world and given direct payments to landowners for undertaking specific land use practices that could increase the provision of hydrological services, biodiversity conservation, erosion prevention, carbon sequestration, or scenic beauty (Jack et al., 2008; Dinh, 2022). The language that denotes ‘payments’ framing for ecosystem services implies a market-based relationship, as it is the same language used for the purchase of products or services (Chapman et al., 2020). Vietnam’s PFES policy, although it represents a strong intervention by the state, employs a neoliberal, market-based language indicating that those who maintain ecosystems in good condition and provide ecosystem services should be paid for doing so. This is essentially a Coasean solution (Coase, 1960; Tietenberg, 2003) (Chapter 2). In PFES design and implementation, the central government, on behalf of ES suppliers, organises payments and determines the price, substituting the ambiguous and difficult-to-manage users’ market demands of ES, essentially bypassing a market-based process for supply and demand to equilibrate through pricing (Chapter 2). This choice of PES modality is largely influenced by the combination of a long history of state’s subsidy for forestry sector, an “yet to be fully opened” market economy, and a heavily centralised economy and resources governance system, including forest governance (Chapter 2 and Chapter 3). In this case, the government’s role is not as “small” as neoliberalism advocates: the government acts as both ‘market creator’ and ‘market regulator’, and also partly a ‘ES provider’ (through the



various state-owned forest management boards that are controlling a large forest land in Vietnam).

Regarding the demand side of PFES, two levels of buyers (users)<sup>29</sup> are distinguished: intermediate buyers and end buyers. Intermediate buyers are hydropower companies (either state-owned or private), water supply companies (mostly state-owned) and private industrial facilities that use water, and both state-owned and private tourist companies – those who use ES as inputs for their production. End buyers are those who consume electricity, water and tourism services – essentially they are customers of the intermediate buyers. In most cases, the intermediary users simply act as fee collectors who pass the fees from one party to the next (end users). Most end users were not aware of the PFES payment part in their electricity and water bills; and information exchange between end users and their suppliers proved to be very limited (**Chapters 2, 3 and 5**). At national level, there is neither a clear demand for the ES nor evidence that PFES is financially more attractive to “intermediate buyers” than other options to secure ES supply (**Chapter 2**). The top four reasons mentioned for paying for PFES were regulatory compliance, securing business sustainability, securing supply of natural resources, and improving the company’s ‘green or environmental’ image (**Chapter 2**). This matches with results found in the Philippines ([Villamor et al., 2007](#)). For end-users, demand for ES-dependent “essential public utilities” (water and electricity) seems to be more clearly expressed in some cases where there are shortages of ES supply. This demand drives users to be willing to pay much higher than PFES payment rate than if a more voluntary PES scheme is in place (**Chapter 5**).

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<sup>29</sup> In PFES policy language in Vietnam, buyers are termed as either “ES users” or “ES beneficiaries”. This is also an indication that a market mechanism is not a preferred terminology to communicate with PFES actors.

While there are some indications that the PES transactions are “realistic”, two of the further core principles of Wunder’s PES definition, contracts that are “voluntary” and “conditional” are not well defined nor used during conceptualisation, design, and implementation of PFES (**Chapters 2, 3 and 5**). The compulsory payment applied to buyers and passive participation of ES suppliers to PFES indicate the lack of voluntariness (**Chapter 2 and Chapter 5**), while land users’ reluctance towards conditional clauses of PES contracts (**Chapter 5**) and the weak monitoring system of PFES (**Chapter 2 and Chapter 3**) show that conditionality is a tall order to PFES stakeholders. This gap between theory and practice of what it termed PES (or in this case PFES) is certainly not unique to Vietnam, and it may indicate a problem for the neoliberal, market-based conceptualisation (particularly in countries that combine a strong state with a neoliberal market approach), rather than indications that the resulting programme cannot function properly (‘work’). It challenges, however, the motivation for using this market-based rationalisation (as an umbrella over) the design of a programme that may work within the Vietnam’s context (**Chapter 5**).

### **Contribution to science/disciplines**

Although the number of studies on PFES in Vietnam has increased significantly since 2010, this study is amongst the very few that tested the market logic from a PFES buyers’ perception and that elicited stakeholders’ views of PFES in an approach that considers both the advantages and disadvantages of market based, state-based and community-based governance as well as their adaptation to particular context and scale in Vietnam. The study contributes to scientific discussion on a balance between “what PES is purported to be conceptually” (theory) and “what PES is on the ground” (practice) ([Castree, 2008](#); [Muradian et al., 2010 & 2013](#); [Büscher, 2012](#); [Büscher, 2014](#); [Fletcher & Büscher, 2017](#); [van Hecken et al., 2018](#); [Kolinjivadi et al., 2019](#); [Shapiro-Garza et al.,](#)

2019; Kaiser et al., 2021; Corbera & Izquierdo-Tort, 2023) in PES framing that has been ever intensified since the first “Wunderian” PES definition (Wunder, 2005). It provides evidence that PES discourses are part of pre-existing institutional governance without using a neoliberal philosophy as the only alternative to forest governance in developing countries like Vietnam. Similar conclusions had been reached for other developing countries and PES designs (Van Noordwijk et al., 2007; Chan et al., 2017 Chapman et al., 2020), but have not yet been incorporated in the mainstream PES literature and academic teaching.

### Societal relevance

These findings have some importation implications to PES policy development not only in Vietnam but also in other countries with similar politico-social context. By and large, the expansion of policies on pricing mechanisms for ecosystem services in Vietnam has not been a radical change to management ideology for forest and resources (e.g. based on neoliberal, market-based mechanisms) but provides new language, rationales for instruments, and maintains the current forest management institutions wherein state budgets and subsidies are largely replaced by a steady financial flow from private sectors. In the case of Vietnam, PFES is perceived by stakeholders as “PES without market” (and thus, without market logic). This could be considered a pragmatic approach to application of “market-based” language (presenting it as Coasean solution). First, the unclear, fragmented ownership of forest lands wherein the state is the largest forest land holder does not constitute the necessary precondition for efficiently addressing externalities through direct negotiation. Second, PFES seems to focus on addressing the wealth inequality between users and suppliers, while a pure “market-based” approach may cause the opposite effect. It thus addresses the “pro-poor” criterion of early PES programme designs in Asia, that according to Wunder’s definition

was not part of the neoliberal logic (McAfee, 2012; van Noordwijk et al., 2007; Leimona et al., 2015). Third and perhaps most important, a true neoliberal market approach would require a very different governing and institutional structure to that existing in Vietnam. Currently, by making use of existing institutional structure and discourses, the government ensures overall stability of forest governance and avoids commoditizing resources and ES. It helps the government to reduce transaction costs and limit involvement of intermediaries (who may capture a significant part of PFES benefits and partly take over government's power in mediating the overall scheme). Finally, the apparent political relevance of using a neoliberal labelling of the PFES programme in its external representation is not matched by the actual design, but this is not a problem for the intended functions of PFES in Vietnam as long as it delivers tangible benefits to forest stakeholders. In addition, it may indicate a lack of attractive labelling alternatives that may be closer to what works in the Vietnam context.

### **6.2.2. Research question 2 – – What discourses either underpin or undermine the Vietnamese government-led PFES approach at national and local scales?**

Three main PFES discourses were found across national, provincial and community scales: a state control discourse, a state neoliberalism discourse, and a PES discourse. Amongst these discourses, the state control discourse is predominant (**Chapter 2 and Chapter 3**). According to this discourse, the state's full control of forest governance was not debatable in the past, and transformation of state's role is not yet needed today. This finding is shared by some other studies that central government may have greater capacity to establish and enforce PES schemes (Suhardiman et al., 2013; Salzman et al., 2018) and thus become the dominant force. For example, central government may be able to establish a legal framework for PES, set standards for the quality of ecosystem services, and ensure that payments are made fairly and transparently. This can help to

promote sustainable forest management, conserve biodiversity, and reduce greenhouse gas emissions. Strong intervention from the central government is often required to address legal and institutional challenges in PES development such as legal framework, fiscal arrangement, property rights, and transaction costs (Fauzi & Anna, 2013; Metzger et al., 2021). In the case of Vietnam, legal basis for payment is based on simple upstream-downstream relationship (where ES flows are demonstrated and understandable by the public); transaction costs are low because the government employs existing institutions collect funds from diffuse beneficiaries; and compliance is ensured through law enforcement and by the fact that the programme pays for practice (forest patrolling) rather than outcome (ES performance).

The three PFES discourses very well reflect the transition of Vietnam's economy and forest governance from a full command-and-control to a more "open" form of governance wherein other stakeholders (than state) can play a larger role. They represent a snapshot of PFES discussions not only at the province level but also at national level; these are the outcome of years of national policy debate and implementation (**Chapter 3**). Although the PES scheme is gaining popularity and is proposed is widely portrayed as a "market-based" mechanism in forest governance, it cannot be separated from the country's political-institutional context. The discourse that market-based mechanism alone can solve the complex problems related to natural resource management and environmental conservation is barely seen as a panacea to ES conservation in Vietnamese context. However, the market-based mechanism could be used as a catalyst to reinforce the benefit of adopting PES schemes along with poverty alleviation in a rural-based economy. The role of government and other institutional arrangements still play a pivotal role in PES implementation in developing countries such as Vietnam.

Analysis of the three PFES discourses and the predominance of state control discourse shows a relatively high level of acceptance of PFES as a policy tool in forest governance, especially in the aspect of bringing-in significant and stable financial resources to forestry sector (**Chapter 3**). It is understandable because markets are one potential source of funding for ES and conservation but are difficult to form and are highly volatile ([Shapiro-Garza, 2019](#)). The government-led PES can be seen as an attempt to create a steady flow of funding for forestry sector from private sector, instead of traditional command and control approaches that rely solely on government funding. The lack of neoliberal elements throughout the discourses except the PES discourse (which is currently a less influencing factor) provides important evidence on level of neoliberalism's penetration in forest governance in Vietnam. The dominance of economic discourse and logic in policy making in the international PES discussion has not materialised in Vietnam. Despite the "market" nomenclature, PFES is indeed a state's regulatory instrument and a part of a government led socio-economic-environmental development agenda (**Chapter 3**). It is generally agreed by PFES stakeholders that government-led PES can ensure that the benefits of ecosystem services are equitably distributed and that the programmes are aligned with broader environmental policy goals. In addition, government-led PES can provide greater certainty for landowners and communities who may be hesitant to participate in market-based schemes due to concerns about market volatility or the fear of losing due to strict market conditionality.

### **Contribution to science/disciplines**

The thesis is amongst the first attempt to identify PFES discourses in Vietnam using empirical data collected by direct elicitation methods. It advances the research frontier in environmental discourse analysis by making visible the assumptions and beliefs that underlie the present debates and implementation of PFES in Vietnam. While a handful of

studies (To et al., 2019, McElwee et al., 2020) has investigated PFES discourses in Vietnam with strong references to the country's forest governance history, this study provides on-the-ground evidence of the existing PFES discourses and analyses such discourses in comprehensive views of PES ontology, performance, institutional structure, and forest governance modality. It provides insights on the way that an incentives structure is instituted by certain governance logics and institutional structure and how an incentive structure adapts with changes in broader socio-economic context.

### Societal relevance

As PFES is part of a broader socio-economic development agenda in Vietnam, it is expected to deliver objectives of conservation and economic and social development at the same time. Experience in Vietnam and countries with a similar political regime such as China, show that such a win-win- situation of conservation and socio-economic development is more easily obtained with a strong state's intervention than with pure market-based mechanisms. For example, an assessment of PES-like programmes in China found that all ecosystem services increased from 2000 to 2010 (except for biodiversity habitat) with mostly positive socioeconomic benefits (Salzman et al., 2018). As such, state's role in PES should not be minimal as neoliberalism suggests, but very much desirable. It will help to ensure preferences for the policy is determined not just by economic interests, but also by broader concerns. However, it has been warned by some other authors including To et al. (2019) about the way PFES operating in the existing tenure structure which privileges formal over customary rights to forest (that could lead to exclusion of poor households), the way that state obtain resources from PFES and redistribute to forest dwellers must be improved toward enhancing active participation at grassroot level based on both contributions and performance (if can be monitored), rather than legal tenure right only. Another social concern drawn from the

PES discourses is that PFES success is an important area for the state to intensify its authoritarian control over forest resources. This could lead to recentralisation of forest governance - government still holds the overall power or rule settings (especially regulating payment rate and PFES fund structure) but allows the ES providers to be more flexible in choosing what they want to do to protect forest and improve land use conditions overall. Concerns remain mostly on how to empower local farmers in participating in PFES decision making and implementation.

### **6.2.3. Research question 3 - To what extent may local communities advance the PES discourses towards a fairer scheme that better addresses their needs?**

Ecosystem services and roles of forests and tree-based ecosystems in providing them are well understood by both forest and non-forest communities where the studies were conducted in northern and central parts of Vietnam (**Chapters 3, 4 and 5**). This valuable knowledge and awareness can be harnessed to inform and advance PFES and other environmental policies (**Chapter 4** and **Chapter 5**). While this knowledge is often context-specific and may not be easily transferable to other settings, it is important to co-produce knowledge on ES, ensure PES policies are based on a more nuanced understanding of ES, and promote more inclusive governance of ecosystem services, by ensuring that the voices and perspectives of local communities are heard and taken into account. The case study shows that while the one-way communication approach to stakeholder participation which is often used to inform and/or educate the public about the PFES and other environmental policies, integrating local knowledge into land-use planning helps to form a bottom-up communication channel that, if well acknowledged and maintained, can bring up tangible benefit to environmental planning and decision-making and help to build trust between PFES parties.



Although the benefit of a two-way communication is clear, the current PFES policy offers limited opportunities for local stakeholders to actively participate and creatively design solutions in forest and ES governance. This can lead to a lack of ownership and buy-in from local communities, potentially resulting in a lack of sustainable impact and even negative consequences. The structure focusing on fixed-rate cash payment rigid rules and regulations that do not allow for local creativity and innovation in designing solutions for forest and ES governance has largely omitted the potential of PES to bridge the interests of landowners, resource users and nature itself (**Chapter 5**).

This study shows that conditional cash payment is not key in motivating local communities in Vietnam to adopt good land use practices to protect and maintain ES flows (**Chapter 5**). The creation of PES mechanisms based on that principle might do more harm than good, if the motivational crowding-out effect outweighs the relative price effect and/or if existing social institutions disintegrate under the pressure of the penetration of market logic (**Chapter 5**). As local communities do not see “conditionality” as a necessary part of PES (**Chapter 5**), the “additionality”, at least at individual level (e.g. a farm) should be reconsidered. At this scale, it may be difficult to measure and verify additionality, especially if the participant is already motivated to conserve natural resources for other reasons, such as cultural or religious beliefs, or if the participant is already complying with existing regulations or social norms. For example, forest protection is already requested by law in the case of Vietnam (Ngoc et al., 2020). In such cases, the PES payment may not be necessary to incentivize desired behaviour changes and may simply represent a transfer of wealth from the users to the suppliers without any additional environmental benefits. The focus of additionality is then indeed at the wider scale, i.e., “*the gross welfare effects induced by the scheme on society...and the total costs incurred to implement it*” (Pascual et al., 2010). In the case of

Vietnam, it appears that PFES policy does not explicitly regulate “fairness elements” at community level (Son et al., 2022) and provides flexibility that pre-existing community structures can be harnessed and thus social acceptance of PFES is elevated (**Chapter 5**). Rural communities can benefit from increased knowledge of sustainable resource use practices that are usually connected to PES through the provision of training and technical assistance (**Chapter 4 and Chapter 5**). Indeed, such in-kind payment is not less desirable than cash payment and can lead to greater impacts in terms of net positive ES outcomes. My finding concurs with some evidence in the literature that PES can act to reinforce non-economic motivations for conservation, thus “crowding in” rather than “crowding out”, especially if landowners already possess a wide range of stewardship values (‘relational values’) (Cowell et al., 2014; Chan et al., 2017; Maca-Millán et al., 2021). PES policy such as PFES need a valuation (but not necessarily a focus on economic pricing) because non congruent interests of buyers and sellers need to be balanced (**Chapter 5**), and more importantly because it helps demonstrating how efforts of individuals and communities contribute to ES delivery—thus inform PES policy design on incentives and commitments on ES of different governance level (**Chapter 4**). While ES valuation can take many different forms, ranging from traditional economic approaches that attempt to assign a monetary value to ecosystem services, to more qualitative approaches, it is important that a full range of benefits including economic, ecological, social, and cultural ones is recognized and valued by a wide range of stakeholders.

### **Contribution to science/disciplines**

My study adds practical evidence to the existing arguments that ‘incentives’ of PES should integrate social exchanges, cultural norms and values, and reflect historical trajectories of state actors that define contextual limits of how PES is implemented and

understood (van Hecken et al., 2018, 2019; White & Lidskog, 2023). This argument has a strong implication for the way PES policy is designed and articulated. Incentives, if solely characterized as neoliberal would undermine a range of local structured norms and interventions that are social and natural positive. The study highlights that PES programmes should be designed with a deep understanding of the social, cultural, and historical context in which they operate. This requires a nuanced understanding of the complex interactions between human behavior, ecological systems, and institutional frameworks, and the ability to design programmes that reflect these interdependencies.

### Societal relevance

Neoliberalism is a political and economic philosophy that emphasizes the importance of free markets, individualism, and private property rights. In the context of PES, neoliberalism is often associated with the idea that PES programmes can be used to create economic incentives for landowners or communities to protect and conserve ecosystems. In contrast, local communities may have a more holistic and culturally-specific understanding of the value of natural resources and ecosystems, which may not be captured by PES programmes or conventional conservation approaches. These values may include spiritual, cultural, and social dimensions, which may not be quantifiable or measurable in economic terms.

One area that PFES has received a lot of criticism is the participation of a large number of smallholders as contracted labors with very little understanding of the policy. This thesis argues that PFES should help to promote local participation and empowerment by involving communities in the decision-making process and recognizing their role in environmental conservation. It is important to recognize that local communities are not passive recipients of PES programmes, but active stakeholders who can contribute to the program's success. By involving local communities in the design and implementation of

PES programmes, and by incorporating their knowledge and expertise, programme designers can help to ensure that the programme is tailored to local needs and priorities, and that it reflects the values and aspirations of local communities. Empowering smallholders fits with the idea of ‘co-investment in landscape stewardship’ (van Noordwijk et al., 2015) as landowner’s investments of time and labor, along with government mediated payments, are used to protect and improve forest conditions.

This study also points to the need of holistic approach for comprehension of ES that would eventually enhance local participation. PES and PFES focus on single ES, thus they privilege an abstract version of conservation, in which nature is measured by de-socialised science and given value through the logic of supply and demand (McAfee, 2012; Gustafsson & Lidskog, 2023). A more system approach to ES based on the concept of production systems in rural areas considers production systems are an integral part of the local ecosystem and helps materialise the linkage between “actions” in the production systems and “results” in terms of ES. This approach offers a more nuanced understanding of the dynamic interactions on the ground and allows policy makers and scientists to better connect farmers’ individual motivations to collective development pathways in that territory.

## 6.3 Reflections

### 6.3.1 Interdisciplinary approach and mixed methods

The study of PES is inherently interdisciplinary in nature because it involves the intersection of ecological, economic, and social systems. The ability to produce interdisciplinary science is therefore central to both PES analysis (MEA, 2005; Costanza & Kubiszewski, 2012; Martín-López et al., 2019; Schutter & Hicks, 2021; Epanchin-Niell et al., 2022) and PES policymaking (McDonough et al., 2017). Unfortunately, traditional single-discipline perspectives that focus on a specific aspect of PES, i.e. biophysical

changes (mapping ecosystem services flows), ecosystem services valuation (economics), and political-institutional arrangements (social research) of PES are still more common than perspectives at the interface of natural and social sciences, and economics (Reid & Moony, 2016; Barthel & Seidl, 2017; Schutter & Hicks, 2021). Among these disciplinary studies, a consistent lack of attention to the social science domain has been noted in PES publications (Hejnowicz et al., 2014)

As mentioned in **Chapter 1** (Introduction), this thesis employs an interdisciplinary approach that combines multiple methodologies that consider environmental, social and economic elements contributing to the rationalizing, planning and operationalisation of PES policy in Vietnam. While the use of discursive institutional analysis (Bas & Buizer, 2009) as the general framework centers around PES discourses and institutional dynamics in PES governance, it is sufficiently flexible to allow integration of some core disciplines in PES research (e.g. biophysical science and economics) that serves as basis to construct substantive content of ES and PES, and also helps to analyse PES at applied level (science-policy interface). As a result, the thesis has successfully examined PES as “boundary objects” (Steger et al., 2018) that integrate diverse forms of knowledge across social groups and organisational scales. For the first empirical chapter (**Chapter 2**), the intrusion of PES into Vietnam’s forest governance was analysed through motivations of PES buyers (economic lens) within institutional- political context of forest management of the country and related to the biophysical and market nature of ES themselves. This contextualisation approach is further extended in the second empirical chapter (**Chapter 3**), where main, emerging PES discourses are found through analysing perceptions of various stakeholder groups (application of Q methodology). In **Chapter 4 and Chapter 5**, some PES discourses are tested within a narrower jurisdictional and institutional context. They demonstrate how anthropogenic changes ultimately impact

environmental conditions and provision of ES, and vice versa, how changes in ES flows will lead to/demand changes in perceptions and relationships of different social groups and local governance structures. The empirical chapters generate a sound knowledge base that understands fundamental baseline ecosystem relationships and the nature and the socioeconomic valuation of ES that can effectively serve as inputs for policymaking and innovation.

The thesis views human values (perceptions, knowledge, markets, behaviors and values, processes of decision making, and resources governance) as the starting point of efforts to rationalise human-nature relationships. As a result, compared to many existing PES studies in Vietnam, this thesis provides a more complete knowledge of the interaction of social and ecological system components and its significance for the provision of ecosystem services and understanding of the human contribution to the provision of ES at scales. It's interdisciplinarity is a step to move beyond the narrow disciplinary framings that focus on monetary valuation and payment schemes that aims at instrumental values of nature only. This also points to our recommendation of focusing on relational values in PES research (more details provided in recommendations for future research section).

Throughout the thesis, qualitative and quantitative research methods were deliberately combined and balanced to deliver a higher level of integration of studies and results. Quantitative and qualitative methods are not just different in the number of research participants; they present wildly different approaches to understanding human behaviour and gaining insights. The combination provides a more comprehensive and nuanced understanding of research questions by leveraging the strengths of both qualitative and quantitative data collection and analysis techniques. For example, through surveys at commune level a qualitative approach, although less standardized,

was helpful to appreciate the ‘sense of place’ (what is relevant and what is not) more than the quantitative data. Application of qualitative approach requires an “instinct” to see nuances at play – there are more nuanced answers between just “yes” or “no”. The best example of the mixed methods is presented in the second empirical chapter (**Chapter 3**) where the Q methodology is applied. The results of the statistical analysis (Q-sorting and factor analysis) are interpreted qualitatively using background knowledge of forest and macro-economic governance in Vietnam. The qualitative Q interpretation focusing on self-referential meaning bring-in insights to the narratives that would be otherwise less sensible developing purely from the numerical factors and existing statements.

It is, however, acknowledged that using interdisciplinary approach and mixed methods has several disadvantages, that will be discussed further in section 6.3.3 ([Limitations of this study](#)).

### 6.3.2 Context matters

This thesis concurs with a significant part of literature that the theoretical definitions of PES (for example: [Wunder 2005, 2015](#)) are quite different from the real-world implementation of policies and programmes labeled with the same terminology. PES policies and practices differ from place to place with regards to contract agreements, payment modes, and compliance, and have diverse cross-sector institutional arrangements that remain primarily state-structured and external donor-financed ([Vatn, 2010; Hejnowicz et al., 2014](#)). While this is not a new knowledge, Vietnam is still an interesting case to see how ‘theoretical’ neoliberal conservation via PES entered a country operating with a very much hierarchical, top-down forest governance mode. The widely recognized PES framing as neoliberal instruments promoted for **voluntary** agreements to address environmental issues that been regulated by government’s rules

with a “command and control” approach (***compliance***). Herein researchers should carefully navigate competing or conflicting priorities between international scientific discussions and national norms and practices. This is not about creating new “realities” or distorting the “realities” as data found in the study, but about finding a way to conduct research that is sensitive to the local political and social dynamics that could influence data collection and interpretation. As a researcher brought up in the Vietnamese culture and language, my presence may have been less intrusive than research involving foreigners, but respondents will not have seen me as ‘neutral’. The following paragraphs discuss this point in more details.

This thesis indicates that the state establishes and extends influence across the PFES system, as much as it plays a key role in driving ES demand as well as PFES funding management. This state centrism (involvement of the private and voluntary sectors should be more restricted) is purposely casted in PFES policy but opposed to the neoliberal PES concept and discussions (engaging private sector as a means of promoting PES effectiveness). The idea that a group of actors is free to negotiate the value of nature that is considered as having been appropriately regulated by governments (on behalf of public interests, through a credible legislation procedure) is considered to be improper by PFES policy makers. Moreover, voluntariness in Western societies is “a choice being made of a person's free will” but in Vietnam’s tradition, it implies “act on one’s will for individual interests” – that is not always positively perceived in a society that highly regards communal values and expectations. Voluntariness in a neoliberal sense is thus out of favour by both political and social norms. Evidently, “compliance payments” and “voluntary payments” are termed “indirect payment” and “direct payment” in PFES policy, and the latter has never been elaborated and operationalised. Appropriateness and meaningfulness as basis for PES



decision making have been relatively unexplored and indeed are linked to one of my recommendations for future research.

The above argument points to the need to frame and communicate PFES-related issues with due attention to the “boundary of compliance” governing nature and society in Vietnamese context. Although “PES” can suggest a neoliberal approach, it should not be seen as replacement of the pre-existing set of rules and governance; neither it should prioritize private interests over public ones. Along this line, PES should not necessarily be regarded as superior to other intervention options, and any of PES governance mode can result in positive outcomes if deemed appropriate by its actors ([Matzdorf et al., 2013](#)). For example, hierarchical governance should not always be perceived as a constraint to PES governance and decision making. Further to my case study of governing multiple ecosystem services through participatory land use planning (**Chapter 4**), it was found that even within the pre-existing monocentric governance system at commune level, there is a possibility to shift the centre of decision-making power away from pure political or autocratic control by using the power of evidence-based information (from research) to negotiate consensually agreed decisions ([Amaruzaman et al., 2022](#)).

From a more practical perspective, there are several innuendos that can be drawn from conducting studies in this thesis. First, the analysis should be made relevant to the jurisdictional scale (e.g. commune, district, province) where decision-making authorities operate and “own” the PFES process. This makes the analysis more sensible, especially to national audience, because administrative decisions have created the balancing point between multiple rights and interests within their jurisdictional boundary ([Solazzo et al., 2015](#)). It will also help to gradually build up relevant norms and pathways that could become the main driver for jurisdictional authorities to adopt more “advanced” PES

policies and practices. Second, common and scientific PES languages and discourses should be localised and sensibly adjusted to local context as much as possible. This is particularly important to NGOs' research and communication given their "bridging" role between the state and civil society, and the state's concerns regarding their "challenging viewpoints" when it comes to natural conservation that can negatively affect state's credibility in handling environmental problems amongst international communities. Third and perhaps most important, contrasting to neoliberal PES, it is suggested that studies on ecosystem services in developing countries like Vietnam should pay more attention to stewardship than ownership, not only because nature and marginalised communities are better protected by stewardship (van Noordwijk et al., 2010; Julian Pratts, 2011; Solazzo et al., 2015; Bobowski & Fiege, 2023), but also because the stewardship dimension is well-suited within existing social-cultural and political norms that tend to take into account the values and interests of whole society in which PES can be more easily accepted and legitimized.

### **6.3.3 Limitations of this study**

Ecosystems are complex systems that involve many interacting factors, including biotic and abiotic components, physical processes, and social systems. This complexity can make it difficult to develop accurate and comprehensive models that capture all of the relevant factors. Similarly, understanding the complexity of these systems can be challenging, especially that identifying and quantifying a complete suite of ecosystem benefits requires enormous evidence and knowledge of nonlinear, complex relationships among these benefits. Studies on ecosystem services may lack comprehensiveness if they fail to capture all of the relevant factors or do not take into account the feedback loops and interactions between different components of the system (Verma, 2021; Horcea-Milcu, 2022; White & Lidskog, 2023). While this thesis

employs an interdisciplinary approach and mixed methods to gain more comprehensive knowledge of PES in Vietnam, it could not provide full understanding of all ecosystem services in the empirical chapters (**Chapters 2 to 5**). It instead reduces the level of complexity by picking a single ES or a small set of ES based on data availability and feasibility of quantification (considering limited available resources and techniques). For these reasons, in **Chapter 4**, while stakeholders' perceptions on a large number of ES were assessed, only carbon sequestration service was mapped and quantified. While this limitation is clear, I also found this a common weakness of PES studies – a review of PES literature revealed that by 2011, fifty percent of studies on ES only focused on a single service ([McDonough et al. 2017](#)).

It is difficult to sufficiently attain both depth and breadth of interdisciplinary research at the same time, and researchers including myself hardly achieve the same level of expertise in multiple disciplines. As a result, sometimes the “depth” studies may not be comparable with single-discipline research. In addition, it is acknowledged that this thesis has certain shortcomings in data and analysis integration. By using mixed methods, it must deal with data collected from different sources, at different scales, using different methods, and sometime incomplete or inconsistent. Attaining coherence of analysis and narrative is therefore challenging. While I try to minimise lack of integrity by clear and consistent communications of research objectives and methods, and by designing case studies as complementing rather than overlapping with each other, a certain lack of integration sometimes seems unavoidable. For example, the use of different methods for assessing willingness to pay (WTP) and willingness to accept (WTA) of the hypothetical PES contract (**Chapter 5**). The study is rather unique – most studies in literature focus either on WTP or WTA, and when they report both, the same methodology is applied (for instance, [Grutters et al., 2008](#)). These studies, however,

mostly report on private goods/services wherein cost-benefit rationale based on monetary units is rather clear. In **Chapter 5**, contingent valuation – the classic method situated in cost-benefit analysis was used to determine WTP for electricity and water supply that can be easily translated to monetary value; however, the same method was not used to determine WTA as it is strongly related to land use practices and cultural values that could be more significantly affected by non-monetary factors and conditions (the results confirmed this hypothesis). In this case, comparing WTA and WTP (for example, WTA/WTP ratio) for cost-effectiveness analysis is not the purpose of the study – rather I want to demonstrate the gaps in current PES approach that sometimes described with “*an unhealthy obsession with individual-level additionality*” (Chan et al., 2017). Hence, although WTA and WTP are not directly comparable as expected in “conservative” economic science, they provide a more useful and deeper understanding of the operational context of PES.

Lastly, the “lack of robustness” should also be mentioned as a drawback of certain approaches to action research used in my study. The use of local ecological knowledge (LEK), for example, is fundamentally important to understand local situation that is further complicated by its socio-political factors and differentiations resulting from gender, ethnicity, and social class and by nuanced power relationships (Ruddle & Davis, 2011). It is quite relevant and often used in ecosystem services studies. This approach mainly employs simplified, unsophisticated theories or concepts that may not always warrant highly replicable outcomes. The LEK is deemed appropriate for rapid assessment, and the results are often considered “initial” and should be followed by ‘solid science’ methods to yield more precise understanding. By using LEK, this thesis could not fully demonstrate relationship between management practices and ES provision (except for carbon storage and sequestration), yet another common problem

of ES studies (Hejnowicz et al., 2014). Linkages between land management practices and ES are either described as assumed or as local perceptions and knowledge. The exact correlation other than simple causality would require unaffordable scientific sampling and analysis within the scope of this thesis.

## 6.4 Recommendations for future research

Having understood the way PES policy design and implementation are shaped by socio-economic and environmental contexts, and that neoliberal logic does not work for current PFES stakeholders in Vietnam in general, it is important that logics and value systems better explain perceptions and behaviors towards PFES adoption and development. This allows better understanding of some of the criticisms of PES and PFES, and how possible changes to the current dominant practices could be made.

### 6.4.1 Integrated approach for effective PES

While a nationally uniform approach of Vietnam's PFES has been criticised for disregarding local peculiarities and local institutions (To et al., 2019), the advantages of such an approach in ensuring coherence and integrity of ES governance are often overlooked. Overall, project-based PES initiatives face a number of challenges that can make it difficult to achieve ES conservation and deliver the social and environmental co-benefits. Recent studies on REDD+ (Duchelle et al., 2018; West et al., 2020, Wunder et al., 2023, West et al., 2023) show that most projects have not reduced deforestation, and carbon emission reductions from voluntary REDD+ projects are overstated as negative baselines were exaggerated. This is not only attributable to technical and methodological challenges in ES accounting and reporting, but also the way projects are governed and “nested”. There are ongoing discussions about whether and how projects should be integrated and mainstreamed individual projects into national or subnational (jurisdictional) systems (Gueiros et al., 2023) with common rules and baselines, so that

the overall additionality in terms of ES can be clearly demonstrated. It is important to note that discussion on “additionality” herein should focus on the overall programme efficiency rather than contribution from individual projects.

The need to scale up activities is well recognized. Jurisdictional PES programmes operating at regional or national scales may address some of the major challenges of site-based projects (Duchelle et al., 2018). Theoretically, large-scale jurisdictional PES programmes are more effective than project-based approach for several reasons: cost effectiveness (reducing transaction costs and increasing bargaining power), greater political and institutional support (as they involve a wider range of stakeholders and often get sufficient attention to build institutional capacity or regulatory frameworks that project-based activities are lacking), greater ecological benefits achieved at a larger geographical scale of intervention; and most importantly, larger scale efforts may be better placed to address the fundamental challenge of key drivers of deforestation. However, experience on jurisdictional PES such as Vietnam may not be easily transferable to other countries with different political and institutional contexts. There is still a need for more robust and comparative analyses that can help identify the conditions under which such PES programmes are most effective, and the factors that contribute to their success or failure.

### **6.4.2 Relational value versus instrumental value**

ES providers, such as local communities or indigenous groups, often have a deep connection to their local ecosystems and place great importance on the cultural and spiritual values associated with these ecosystems. They may also rely on these ecosystems for their livelihoods and traditional practices. On the other hand, PES programmes typically focus on the economic value of ecosystem services, with an emphasis on market-based approaches that prioritize efficiency and profitability. This

can lead to a narrow focus on a limited set of ecosystem services that can be easily quantified and monetized, potentially overlooking the cultural and spiritual values that are important to ES providers. Different values articulated by PES programmes and conventional environmental conservation may lead to conflicts between ES providers and these programmes (Chan et al., 2017; Gustafsson & Lidskog, 2023). Unfortunately, there is little understanding of the multiple motives that reflect the interconnection of ecological services and how to trigger bottom-up environmental negotiation processes among public and private actors with mutual understandings of their value systems.

Recent interest in the global climate change and biodiversity community in ‘instrumental’ (ecology-economic, goal-oriented efficiency) versus ‘relational’ (ecological-social, harmony-oriented fairness) values as basis for understanding and managing the people-nature interactions from local to global scale (Arias-Arévalo et al., 2017; Chan et al. 2017; Lliso et al., 2022; van Noordwijk et al., forth coming). In this thesis, it was found that despite its ‘economy first’ nomenclature, Vietnam’s PFES programme operates as a co-investment, where the efficiency-fairness tradeoff is manageable, where participation in PFES was considered a reward for labour to work in forests and a means to compensate for the foregone legal claims to traditional use rights of participants. It is assumed that farmer’s participation in PFES has been induced by a range of intrinsic and extrinsic motivations, while PFES seems to oversimplify peoples’ motivations by only recognizing extrinsic motivations and thus incentivizing them through direct payments. The interaction between the “neoliberal type” value system and the value systems on the ground deserves to be further investigated.

### 6.4.3 PES decision making logic

Ecosystem services must be explicitly and systematically integrated into decision making by individuals, enterprises, and governments. Study on PES decision making

tends to focus on providing scientific evidence to support the decision making rather than understanding the “making of decision” itself. Typical concerns have been pivoting around understanding how human actions affect ecosystems, the provision of ecosystem services, and the value of those services (Martinez-Harms et al., 2015; Daily et al., 2017). It is largely driven by the need to demonstrate “additionality” of PES that is rooted in neoliberal school of thoughts. Nevertheless, the logic should go beyond additionality to understand people’s motivation, the social norms and the broader vision of conservation that embrace a wide range of benefits (Daily et al, 2017; Epanchin-Niell et al., 2022).

Public administration and policy scholars (Schulz, 2018; Dewulf et al., 2020) have distinguished two logics of decision-making, that are the logic of consequentiality (decisions are made based on the expected outcomes or consequences of decision options) and the logic of appropriateness (decisions are guided by rules relevant to the current situation). While these two logics are essential in understanding the use of environmental knowledge in decision making, there are increasing arguments for a third decision-making logic, namely the logic of meaningfulness which principally considers the ideas of sensemaking and interpretation. The process of decision-making in this context relies on the way decision-makers comprehend and interpret the significance of a given decision problem, its surrounding circumstances, and the available options for decision-making.

This thesis found that global “neoliberal PES” is largely based on logic of consequence (performance-based payment for ES will help ecosystems and ES to be well preserved at reasonable cost), while PFES policy is dominated by a logic of appropriateness (buyers have to pay due to their social responsibility, although whether payments make any change to ES flows is ambiguous). In very complex decision-making situations characterized by uncertainty (incomplete knowledge) and ambiguity (conflicting views)



such as PES in general and PFES in particular, clarity about the consequences or appropriateness of decisions options is usually lacking. Therefore, more in-depth studies on how the impact logics for PES in specific contexts and the knowledge needed for such decision making, can provide meaning and clarity for program/policy design and implementation, consolidate legitimacy and the role of PES/PFES as potentially powerful forest governance tool.

#### 6.4.4 Communicating PES from top to bottom

While the terms ES and PES have been increasingly used in academic circles, they are much less clearly understood by PES stakeholders who actually implement PES schemes and projects. In addition, they are articulated, translated and perceive differently by different stakeholder groups in different socio-political and historical contexts. This situation has been reported in many studies on PES and REDD+ around the world such as in Mexico (Muradian et al., 2010), Colombia (Hayes, 2012), Vietnam (To et al., 2013; this study); Cambodia (Pasgaard, 2015), Indonesia (Lapeyre et al., 2015), Tanzania (Rantala et al., 2015), and Scotland (Martin-Ortega et al., 2021). While PES project/programme initiators often advocate that PES makes conservation practices economically rewarding and that this requires linking conservation to market (Hayes, 2012), it is often understood by local PES implementing actors as “something else”. That “something else” could be a mandatory conservation fee, a subsidy, a donation, a state-run programme for conservation, or even an “unknown” system operated by external experts. In many cases, this lost in translation could lead to crowding – out effect because signals of incentives/payment are wrongly interpreted: *“crowding out does not follow from the use of incentives per se, but rather from the meaning that the incentives convey to the participants”* (Bowles, S., & Polania-Reyes, 2012). However, in some cases it may help to avoid negative consequences of the single use of neoliberal languages and practices -

external financial incentives may give rise to pseudo-adopters who only maintain good practices as long as they are paid (Hayes, 2012).

Nevertheless, the fragmented understanding of PES among its actors limits information flows and thus can be counter effective. Removing barriers to enhance communication between actors will help to reveal the underlying logics of PES discourses and actions that, in turn, may increase the chances of successful operation of participatory governance modes (Rantala et al., 2015). Yet the complexity of PES is well acknowledged, and a perfect information dissemination structure is not expected in most cases of PES implementation. The optimal level of information exchanges between PES actors to ensure effective implementation with acceptable transaction costs is very much desirable, yet largely unexplored in PES studies.

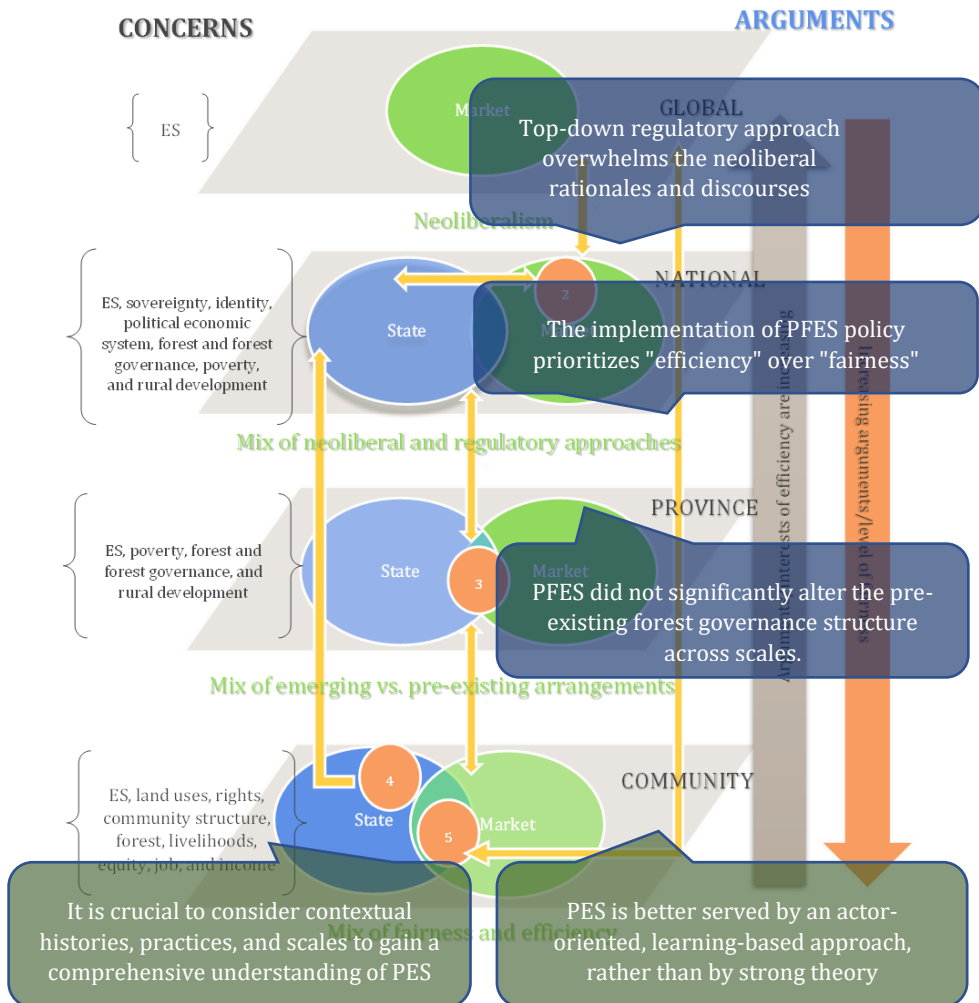
## 6.5 Conclusions and policy recommendations

### 6.5.1 Conclusions

The main findings are superimposed on the conceptual scheme (Figure 1.1) of the introduction in Figure 6.1.

A main conclusion of this thesis is that the understanding by stakeholders and actual practices differ significantly from the ideal portrayed in the neoliberal PES definition, with very weak elements of conditionality and voluntariness. As much as the multiple concerns and arguments of PFES policy are investigated in this study (see Figure 6.1), the regulatory approach overwhelms the neoliberal approach in PFES rationales and discourses (Chapters 2 & 3), and the PFES policy implementation focuses heavily on “efficiency” rather than “fairness” (Chapters 3, 4 & 5), especially in benefit distribution to local PFES actors. Although PFES has brought some changes to policy conceptualisation and discourses (Chapters 2 & 3), these changes were neither profound nor significantly alter the pre-existing forest governance structure across

“scales” (**Chapters 3 & 4**). This thesis emphasizes the need go wider than the neoliberal PES ontology (e.g., how neoliberal a PES scheme is) and defines other practices that actors mobilise to make sense and implement PES. There are two implications: PES needs to be understood in terms of its situational histories, practices and scales; and PES is better characterized by ‘weak theorisation’ and an actor-oriented, learning-based approach.



**Figure 6. 1** Main conclusions (blue boxes) and general recommendations (green boxes)

### **6.5.2 Empowering local farmers and communities in PFES**

While a neoliberal type of PES often associated with a narrow focus on economic efficiency are neither well-fitted to Vietnam's political and institutional context nor well perceived by "ES" stakeholders (as found in this thesis), such approach could be useful to improve the existing forest governance system and, to some extent, will yield more win-win cases regarding environmental and socio-economic benefits. It is recommended that to improve implementation of the regulatory PFES, the government could expand the range of payable ES, encourage more private sector buyers, and play a more active role as facilitator and enabler in the national Payment for Forest Environmental Services (PFES) programme. A state operated PES programme integrating components of a Coasean approach would be an innovation-oriented PES systems development and ES provision. If PFES does not dictate appropriate stewardship actions, but rather invite ES suppliers to propose what they would like to do to secure a specific environmental outcome (thus combining a top-down approach from demand side with a bottom-up approach from supply side in a hybrid model), it will likely motivate creative solutions from suppliers in an effective manner and even enable self-organised solutions of local communities in ES stewardship. While this implies a significant change in mindset of PFES decision makers, it would only require moderate changes in current PFES policy, that is amendment of under-law policy documents (decrees and circulars) that guides PFES implementation. This can be done at ministry level (Ministry of Agriculture and Rural Development, MARD)

### **6.5.3 Place-based governance structure**

Issues around fairness and justice (such as passive participation of local communities, lack of adaption to local social and cultural norms, questionable transparency of benefit distribution system, lack of power of both buyers and sellers in decision making, etc.)

within PFES could be addressed through a place-based PES governance approach that makes use of local institutional structures and in which the local community is closely involved in local-level planning and management, rather than merely executing the PFES scheme. Making use of local institutional structure is important because PES outcomes largely depend on institutions where it is operated. Local communities should be supported to identify and map the ecosystem services that they rely on, including both the tangible and intangible benefits that they receive from their local ecosystems. This will help to generate a holistic understanding of the social, economic and biophysical conditions of the landscape, and at the same time help to raise awareness of the value of these services and provide a basis for negotiating PES agreements. Such governance approach differs from the current practice of PFES governance and requires local governments and forest authorities to share and delegate some of their decision making power to the other partners to achieve agreed rules of natural resource management. This change may require more radical changes of laws and regulations in Vietnam as community-based institutional structures are hardly recognized by laws and regulations beyond the Law on Forestry (2017). At the very least, MARD can use regulations under the Law on Forestry at the starting point to showcase “successes” and advocate for further renovations of relevant laws and regulations.

#### **6.5.4 Expanding PFES beyond institutionally defined forest lands**

While PFES is centred around ES generated from legal forest land, it was found that other good land use practices are highly acknowledged by the public and local communities to also deliver ES. The scope of PFES is recommended to expand to cover such land use practices. This approach offers opportunities to include different perspectives in managing the agroforestry-mosaic landscapes for both economic and environmental objectives that have been often neglected by policymakers and ES-buyers who consider

ES-benefits from forests only. In doing so, special attention should be paid to build public trust in the management of the upstream natural resources and ES providers, and government should be attentive to connecting and balancing needs of providers who are poor communities and users who want to have more secured supply of ecosystem services. This would require harmonisation of Law on Forestry (2017) (that regulates payment for forest environmental services) and Law on Environmental Protection (2018) (that regulates payment for ecosystem services) and agreements at governmental level on how payment for ecosystem services should be managed beyond the current framework of PFES policy.

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# Summary

Ecosystem services (ES) are nature's contributions to people. Human societies depend on healthy ecosystems as they provide essential ES: nutrients cycling, air purification, water supply, climate regulation, carbon sequestration, etc. Due to the alarming rates of degradation in ES and its associated values and benefits, there has been a rising trend in interventions that utilise an ecosystem services approach, including strategies focused on incentive-based ecosystem conservation. During the past two decades, "Payments for Ecosystem Services" (PES) have received a great deal of attention. PES is primarily grounded on the assumption that by economically quantifying the value of ecosystems, it becomes feasible to develop effective programmes aimed at mitigating the loss of ecosystem services. A very well-known definition of PES is provided by [Wunder \(2005\)](#): PES as voluntary transactions where a well-defined ecosystem service (or a land-use likely to secure that service) is being "bought" by a minimum of one ES buyer from a minimum of one ES provider if and only if the ES provider secures ES provision during a determined time (conditionality). As such, PES follows a neoliberal logic that emphasizes the power of economic incentives, often through market-based mechanisms, to incentivize behaviors that enhance the efficiency and cost-effectiveness of ecosystem service provision. This approach aims to reduce the influence of the state in resource governance and promote effective ways to conserve and regenerate ecosystems. However, while pure PES schemes that fulfil all the criteria of Wunder's definition may be theoretically feasible, they are often challenging to implement and may not always be preferable.

Discussion on PES ontology and practices has led to intensified debate on roles of the state/government (regulatory approach) and the market (neoliberal approach) in ecosystem services governance. Understanding the practice of PES schemes becomes crucial when examining the interplay between market governance (neoliberal market-

based approaches) and state governance (regulatory and policy) and how these dynamics are perceived and interpreted by stakeholders at different levels of governance (national, sub-national, grassroots). Additionally, it is essential to investigate how PES policies are shaped by actors involved in PES implementation to align with local social, cultural, or economic priorities.

The objective of this thesis is to contribute to PES discussions by offering valuable insights into the "what works" and "how" aspects of PES policy development and implementation in Vietnam. The case of Vietnam is particularly significant due to its relevance in comprehending PES development within the context of a "state socialism" country undergoing multiple transitions under strong state control over the economy and society. The overall research goal is to examine how the PFES policy, initially introduced as a neoliberal concept, has been influenced and shaped by the local context in which it is situated. Under this general research question, the specific research questions are: (i) To what extent does neoliberal PES logic work in Vietnam?; (ii) What discourses either underpin or undermine the Vietnamese government-led PFES approach at national and local scales?; and (iii) To what extent may local communities advance the PES discourses towards a fairer scheme that better addresses their needs? I apply perspectives of discursive-institutional analysis as the main analytical approach and use multiple methods and analytical frameworks for different "case studies" which are presented as chapters in this thesis.

**Chapter 1** (*General Introduction*) provides background of the thesis, problems definition, research questions and methodological approach.

**Chapter 2** (*How does market logic work in payment for forest environmental services in Vietnam?*) addresses the first research question by analysing buyers' motivation in PFES

payment in Vietnam to see if the market logic works for PFES and what is the current role that the Government of Vietnam is playing in the process. An online survey was held for a total of 59 existing and potential ES buyers in Vietnam. The main motivation of the private sector to pay for PFES was found to be regulatory compliance. It was also found that although private-sector voluntary engagement is currently lacking, it is interested and willing to pay for ES. However, in their perspective, the ES that are regulated by the PFES policy had very weak elements of private goods and are thus difficult to be rationed. On the governance side, although the government has created a PFES structure, it neither facilitates direct engagement between ES buyers and providers, nor does it create an enabling environment for the emergence of voluntary payment schemes.

**Chapter 3** (*Payment for forest environmental services in Vietnam and views on its success: a Q methodology study*) offers a Q methodology study to understand provincial stakeholders' perspectives on PFES (second research question). This chapter explores the discourses that underpin PFES debates and practice in Son La province, one of the first provinces to implement PFES in Vietnam. Drawing on interviews with PFES actors and utilizing Q-methodology, this chapter identifies three overarching meta-discourses concerning PFES: state-controlled, state-neoliberalism, and PES. These meta-discourses reflect the transition of the economy and forest governance practices in Vietnam. These meta-discourses mirror the economic transition and forest governance practices in Vietnam, shedding light on the evolving landscape. Analysing these meta-discourses reveals a notable level of social acceptance of the PFES policy, while also suggesting that the success of PFES could potentially provide a basis for the State to strengthen its authoritarian control over forest resources.

The narratives within these meta-discourses exhibit varying perspectives on the fundamental principles of PFES, influenced by shifts in economic development and forest

governance. They also reflect differing views on the perceived performance and effectiveness of PFES, as well as the extent of its integration into the forest policy framework. Furthermore, the motivations of local farmers participating in paid forest protection activities are also seen differently across these narratives. As state power expands in forest governance, the primary concerns revolve around ensuring that PFES effectively yields positive economic and environmental outcomes while establishing and operating a monitoring system that is transparent, accountable, and separate from political interests. Additionally, there is a strong emphasis on empowering local farmers, enabling them to actively participate in the decision-making and implementation processes of PFES initiatives.

**Chapter 4** (*Enhancing community engagement in governing landscape and ecosystem services: a participatory land-use scenario development*) deals with the third research question by analysing the way stakeholders engage in participatory land use planning processes to demonstrate their contributions to national ES targets (greenhouse gas emissions and carbon sequestration). The study was undertaken at commune level, the lowest jurisdictional tier of the administration system in Vietnam, where socio-economic and environmental plans and decisions are made. The assessment employed the Land-Use Planning for Multiple Ecosystem Services (LUMENS) framework and a number of methods and tools, including land-use mapping, GIS-based land-use change analysis, survey questionnaire, rapid carbon-stock appraisal for different land uses, qualitative ecosystem services assessment, and a back-casting technique. The findings indicate that the successful implementation of current land-use planning and relevant policies, such as payment for forest environmental services and nationally determined contributions, is hindered by inadequate participation and recognition of customary land-use practices. The study further affirms the significant role of forests and the land-use sector in



attaining national emission reduction targets, particularly when local stakeholders are engaged early in the planning process. The study underscores the importance of considering tree-based land uses, recognizing the co-benefits of ecosystem services, and implementing inclusive and participatory land-use planning approaches for improved policy outcomes and effective governance in rural areas.

**Chapter 5** (*Voluntariness and conditionality considerations in developing pro-poor PES at community level in Vietnam*) further addresses the third research question, and partly the first research question at community level (non-administrative). By analysing the willingness to accept (using discrete choice experiment method) and willingness to pay (using contingent valuation method) for a hypothetical PES contract, I identified constraints to “market-based” PES according to local communities’ perspectives and propose solutions to promote voluntary PES. Regarding voluntariness, the study presents a clear opportunity to engage stakeholders more actively in securing downstream water supply and developing sustainable land use practices upstream through a PES scheme without creating an artificial ES demand through regulatory administration. Meanwhile, level of conditionality was found a limiting factor to participation of poor, upstream communities. WTA was only high at low monitoring level (low conditionality). Results from WTP and WTA studies provide a need to shift from the neoliberal language towards “stewardship” language. A pro-poor PES approach is proposed, aiming to empower local communities by augmenting their capacity and responsibilities while providing external financial incentives. This approach facilitates the gradual achievement of desired economic and environmental goals. Building trust is crucial to strengthen conditionality, which is complemented by non-monetary rewards that enhance providers’ capabilities. By combining financial incentives with capacity-building measures, this stepwise approach promotes sustainable development while

addressing the needs and aspirations of local communities. This way of PES framing (stewardship) embraces both relational and (partly) instrumental values, is fairer (because it recognizes the multiple ways that various social actors perceive the environment values), is more likely to cause motivational crowding-in, and thus ensure sustainability of the payment.

**Chapter 6** (*Synthesis*) provides synthesis of the above chapters, conclusions and recommendations to policy and future research. Through studies provided in this thesis, it examines the perceptions and understandings of stakeholders regarding the integration of PES as a global neoliberal environmental policy within Vietnam's forest governance, with a specific focus on PFES policy. The findings reveal notable disparities between these understandings and the idealised portrayal of neoliberal PES, with weak elements of conditionality and voluntariness observed. The notion of addressing environmental challenges through monetary incentives, as proposed by the neoliberal logic, does not necessarily align with the perspectives of PFES participants and is scarcely reflected in the actual implementation of PFES. While PFES has introduced certain changes to policy conceptualisation and discourses, these changes are neither profound nor significantly transformative of the pre-existing forest governance structure. Based on these findings, I emphasize the importance of moving beyond the narrow scope of the neoliberal PES ontology, which primarily focuses on the degree of neoliberalism within a PES scheme. Instead, it is crucial to consider the diverse practices employed by actors to make sense of and implement PES. This perspective highlights two key implications: firstly, understanding PES requires an examination of its contextual histories, practices, and scales; and secondly, PES is better characterized by "weak theorisation" and an actor-oriented, learning-based approach. I also reflect on the significance of employing an interdisciplinary and mixed methods approach in PES

research, acknowledging the need to pay attention to the local contexts where studies are conducted, and recognizing the limitations of this thesis. Recommendations for future research include promoting an integrated approach to enhance the effectiveness of PES implementation, shifting attention from instrumental values to relational values in PES studies, investigating the decision-making logic behind PES, and exploring how PES should be communicated and clarified among its various actors.



# Samenvatting

Ecosysteemdiensten (ES) bestaan uit bijdragen van de natuur aan mensen. Menselijke samenlevingen zijn afhankelijk van gezonde ecosystemen omdat deze essentiële ES leveren: de voedingsstoffencyclus onderhouden, luchtzuivering, watervoorziening, klimaatregulering, koolstofopslag, enzovoort. Vanwege de verontrustende snelheid waarmee ES degraderen en de bijbehorende waarden en voordelen verloren gaan, is er een toename van programma's die een ecosysteemdienstenbenadering gebruiken, inclusief strategieën gericht op ecosysteembehoud via financiële prikkels. In de afgelopen twee decennia hebben "Betalingen voor Ecosysteemdiensten" (PES) veel aandacht gekregen. PES is voornamelijk gebaseerd op de veronderstelling dat door de waarde van ecosystemen economisch uit te drukken, het haalbaar wordt om effectieve programma's te ontwikkelen gericht op het tegengaan van het verlies van ecosysteemdiensten. Een zeer bekende definitie van PES is gegeven door [Wunder \(2005\)](#): PES als vrijwillige transacties waarbij een goed gedefinieerde ecosysteemdienst (of een landgebruik dat waarschijnlijk die dienst veiligstelt) wordt "gekocht" door ten minste één ES-koper van ten minste één ES-leverancier, mits de ES-leverancier de ES-levering gedurende een bepaalde tijd veiligstelt (voorwaardelijkheid of conditionaliteit). Als zodanig volgt PES een neoliberale logica die de kracht van economische prikkels benadrukt, vaak via marktgebaseerde mechanismen, om gedrag te stimuleren en zo de efficiëntie en kosteneffectiviteit van ecosysteemdienstenverbetering te bevorderen. Deze benadering heeft tot doel de invloed van de staat op het bestuur van natuurlijke hulpbronnen te verminderen en effectieve manieren te bevorderen om ecosystemen te behouden en te regenereren. Echter, hoewel zuivere PES-schema's die aan alle criteria van de definitie van Wunder voldoen theoretisch haalbaar kunnen zijn, zijn ze vaak moeilijk te implementeren en zijn ze niet altijd de beste keuze.

De discussie over PES-ontologie en praktijken heeft geleid tot intensief debat over de rollen van de staat c.q. overheid (regulerende benadering) en de markt (neoliberale benadering) in het bestuur van ecosysteemdiensten. Het begrijpen van de praktijk van PES-schema's is cruciaal bij het onderzoeken van de wisselwerking tussen markt (neoliberale marktgerichte benaderingen) en overheidsbestuur (regelgevend beleid) en hoe deze dynamiek wordt waargenomen en geïnterpreteerd door belanghebbenden op verschillende bestuursniveaus (nationaal, subnationaal, lokaal). Bovendien is het essentieel om te onderzoeken hoe PES-beleid wordt gevormd door actoren die betrokken zijn bij de uitvoering van PES om dit aan te passen aan lokale sociale, culturele of economische prioriteiten.

Het doel van dit proefschrift is bij te dragen aan de discussies over PES door waardevolle inzichten te bieden in de "wat werkt" en "hoe" aspecten van PES-beleidsontwikkeling en implementatie in Vietnam. Vietnam is hier van belang voor het begrijpen van de ontwikkeling van PES in de context van een "staatssocialistisch" land dat meerdere overgangen doormaakt in de vanouds sterke staatscontrole op economie en samenleving. Het algemene onderzoeksdoel is te onderzoeken hoe het PFES-beleid, oorspronkelijk geïntroduceerd als een liberaal concept, is beïnvloed en gevormd door de plaatselijke omstandigheden waarin het zich bevindt. Onder deze algemene onderzoeksvraag zijn de specifieke onderzoeksvragen: (i) In hoeverre 'werkt' de neoliberale PES-logica in Vietnam?; (ii) Hoe wordt de door de Vietnamese overheid geleide PFES-benadering begrepen (of ondermijnd?) op landelijke en plaatselijke schaal?; en (iii) In hoeverre kunnen plaatselijke gemeenschappen de PES-discussie omvormen naar een rechtvaardiger schema dat beter inspeelt op hun behoeften? Ik gebruik de gezichtspunten van 'discursief-institutionele' analyse als de belangrijkste analytische benadering en maak gebruik van meerdere methoden en analytische kaders

voor verschillende deelstudies die in dit proefschrift als hoofdstukken worden gepresenteerd.

**Hoofdstuk 1** (*Algemene inleiding*) geeft de achtergrond van het proefschrift, definieert de problemen, onderzoeksvragen en onderzoeksmethoden.

**Hoofdstuk 2** (*Hoe werkt marktlogica in betalingen voor bosmilieudiensten in Vietnam?*) behandelt de eerste onderzoeksvraag door de motivatie van kopers bij PFES-betalingen in Vietnam te analyseren om te zien of de marktlogica werkt voor PFES en wat de huidige rol is van de regering van Vietnam in het proces. Via een online enquête werden in totaal 59 bestaande en potentiële kopers van ecosysteemdiensten in Vietnam ondervraagd. De belangrijkste motivatie van ondernemingen om te betalen voor PFES was naleving van regels. Er werd ook gevonden dat hoewel de vrijwillige betrokkenheid van de ondernemingen momenteel ontbreekt, deze wel geïnteresseerd zijn en bereid zijn te betalen voor ecosysteemdiensten. Echter, vanuit hun perspectief vertegenwoordigen de ecosysteemdiensten die worden gereguleerd door het PFES-beleid vooral een algemeen belang dat moeilijk op te delen is. Aan de bestuurskant heeft de overheid weliswaar een PFES-structuur gecreëerd, maar faciliteert zij geen directe betrokkenheid tussen kopers en aanbieders van ecosysteemdiensten, noch creëert zij een stimulerende omgeving voor de opkomst van vrijwillige betalingsregelingen.

**Hoofdstuk 3** (*Betaling voor bosmilieudiensten in Vietnam en meningen over het succes ervan: een Q-methodologische studie*) biedt een Q-methodologische studie om het perspectief op PFES te begrijpen van belanghebbenden op provinciaal niveau (tweede onderzoeksvraag). Dit hoofdstuk onderzoekt de discussies die ten grondslag liggen aan PFES-debatten en praktijken in de provincie Son La, een van de eerste provincies die PFES in Vietnam tot uitvoering bracht. Op basis van interviews met PFES-actoren en het

gebruik van Q-methodologie worden drie overkoepelende gespreksthema's (metadiscoursen) over PFES geïdentificeerd: door de staat gecontroleerd, staatsneoliberalisme en PES. Deze gespreksthema's weerspiegelen de economische beleidstransitie en het bosbeheer in Vietnam en werpen licht op het evoluerende landschap. Het analyseren van deze gespreksthema's onthult een opmerkelijk niveau van sociale acceptatie van het PFES-beleid, maar suggereert ook dat het succes van PFES mogelijk een basis kan bieden voor de Staat om zijn autoritaire controle over bossen te versterken.

**Hoofdstuk 4** (*Het versterken van betrokkenheid van de gemeenschap bij het besturen van landschap en ecosysteemdiensten: ontwikkeling van een participatief scenario voor landgebruik*) behandelt de derde onderzoeksvraag door te analyseren op welke manier belanghebbenden betrokken zijn bij participatieve processen van landgebruiksplanning om hun bijdragen aan nationale ES-doelstellingen (broeikasgasemissies en koolstofopslag) te demonstreren. Het onderzoek werd uitgevoerd op het gemeenteniveau, het laagste bestuurlijke niveau in het administratieve systeem van Vietnam, waar socio-economische en milieuplannen en beslissingen worden genomen. De beoordeling maakte gebruik van het Land-Use Planning for Multiple Ecosystem Services (LUMENS) raamwerk en een aantal methoden en instrumenten, waaronder landgebruiksmapping, op GIS gebaseerde analyse van landgebruiksveranderingen, enquêtevragenlijst, typering van koolstofvoorraden voor verschillende vormen van landgebruik, kwalitatieve beoordeling van ecosysteemdiensten en reconstructie van lokale geschiedenis. De bevindingen geven aan dat de succesvolle uitvoering van huidige landgebruiksplanning en relevante beleidsmaatregelen, zoals betaling voor bosmilieudiensten en nationaal bepaalde bijdragen, wordt belemmerd door onvoldoende participatie en erkenning van bestaande praktijken van landgebruik. Het



onderzoek bevestigt verder de belangrijke rol van bossen en de landgebruikssector bij het behalen van nationale doelstellingen voor emissiereductie, vooral wanneer lokale belanghebbenden vroegtijdig betrokken zijn bij het planningsproces. Het benadrukt het belang van het overwegen van boomgebaseerde vormen van landgebruik, het erkennen van de nevenvoordelen van ecosysteemdiensten en het toepassen van inclusieve en participatieve landgebruiksplanning voor verbeterde beleidsresultaten en effectief bestuur van het platteland.

**Hoofdstuk 5** (*Overwegingen van vrijwilligheid en voorwaardelijkheid bij het ontwikkelen van PES voor de armen op gemeenschapsniveau in Vietnam*) behandelt verder de derde onderzoeksvraag en gedeeltelijk de eerste onderzoeksvraag op gemeenschapsniveau (niet-bestuurlijk). Door de acceptatiebereidheid (WTA; met behulp van de discrete keuze-methode) en de betalingsbereidheid (WTP; via de methode van 'contingent valuation') voor een hypothetisch PES-contract te analyseren, werden beperkingen van "marktgebaseerde" PES geïdentificeerd volgens de gezichtspunten van plaatselijke gemeenschappen en worden oplossingen voorgesteld om vrijwillige PES te bevorderen. Met betrekking tot vrijwilligheid biedt het onderzoek een duidelijke kans om belanghebbenden actiever te betrekken bij het veiligstellen van de wateraanvoer stroomafwaarts en het ontwikkelen van duurzame landgebruik stroomopwaarts via een PES-schema zonder een kunstmatige vraag naar ES te creëren via regelgevend bestuur. Ondertussen bleek het niveau van voorwaardelijkheid een beperkende factor te zijn voor de participatie van arme gemeenschappen stroomopwaarts. WTA was alleen hoog bij een laag controle niveau (lage voorwaardelijkheid). Resultaten van WTP- en WTA-studies tonen de noodzaak aan om over te stappen van de neoliberale taal naar de taal van "beheer". Een armoedeverminderende PES-benadering wordt voorgesteld, met als doel plaatselijke gemeenschappen te versterken door hun capaciteit en

verantwoordelijkheden te vergroten, terwijl externe financiële prikkels worden geboden. Deze benadering bevordert de geleidelijke verwezenlijking van gewenste economische en milieudoelstellingen. Het opbouwen van vertrouwen is cruciaal om de voorwaardelijkheid te versterken, wat wordt aangevuld met niet-monetaire beloningen die de mogelijkheden van aanbieders vergroten. Door financiële prikkels te combineren met capaciteitsopbouwende maatregelen bevordert deze stapsgewijze benadering duurzame ontwikkeling en komt tegemoet aan de behoeften en aspiraties van lokale gemeenschappen. Deze inkadering van PES (beheer) omvat zowel relationele als (gedeeltelijk) instrumentele waarden, is rechtvaardiger (omdat het de meervoudige manieren erkent waarop verschillende sociale actoren de waarden van het milieu begrijpen), heeft meer kans de bestaande motivatie te versterken ("crowding-in") en vergroot de duurzaamheid van het programma.

**Hoofdstuk 6** (*Synthese*) biedt een samenvatting van de bovenstaande hoofdstukken, conclusies en aanbevelingen voor beleid en toekomstig onderzoek. Via de studies die in dit proefschrift worden gepresenteerd, onderzoekt het de percepties en begrip van belanghebbenden met betrekking tot de integratie van PES als een wereldwijd neoliberaal milieubeleid binnen het bosbeheer van Vietnam, met een specifieke aandacht voor het PFES-beleid. De bevindingen tonen opmerkelijke verschillen aan tussen de geïdealiseerde voorstelling van neoliberaal PES en hoe het in de praktijk wordt gebracht, waarbij zwakke elementen van voorwaardelijkheid en vrijwilligheid worden waargenomen. Het idee om milieuproblemen aan te pakken door middel van financiële prikkels, zoals voorgesteld door de neoliberale logica, komt niet noodzakelijk overeen met de perspectieven van PFES-deelnemers en komt nauwelijks tot uiting in de daadwerkelijke uitvoering van PFES. Hoewel PFES bepaalde veranderingen heeft geïntroduceerd in het conceptueel beleid en de gespreksthema's, zijn deze

veranderingen noch diepgaand noch significant transformerend voor de bestaande structuur van bosbeheer. Op basis van deze bevindingen benadruk ik het belang van het verder gaan dan de beperkte reikwijdte van de neoliberale PES-ontologie, die zich voornamelijk richt op de mate van neoliberalisme binnen een PES-schema. In plaats daarvan is het cruciaal om de diverse praktijken te overwegen die door actoren worden gebruikt om PES te begrijpen en te implementeren. Deze benadering benadrukt twee belangrijke implicaties: ten eerste vereist het begrijpen van PES een onderzoek naar de contextuele geschiedenis, praktijken en schalen; en ten tweede wordt PES beter gekarakteriseerd door "zwakke theorievorming" en een op actoren gerichte, op leren gebaseerde benadering. Ik reflecteer ook op het belang van het gebruik van een interdisciplinaire en gemengde methoden aanpak in PES-onderzoek, waarbij wordt erkend dat aandacht moet worden besteed aan de plaatselijke omstandigheden waarin studies worden uitgevoerd, en de beperkingen van dit proefschrift worden erkend. Aanbevelingen voor toekomstig onderzoek omvatten het bevorderen van een geïntegreerde benadering om de effectiviteit van PES-toepassing te verbeteren, het verschuiven van de aandacht van instrumentele waarden naar relationele waarden in PES-studies, het onderzoeken van de besluitvormingslogica achter PES en het onderzoeken van hoe PES moet worden gecommuniceerd en verduidelijkt onder de verschillende actoren.



# Annexes

## Annex 1: Population of opinion statements (concourse) used for Q-sorting

### The concourse (the original statement in Vietnamese is provided)

#### **Research question 1 – Is the emerging PFES perceived as a neoliberal, market-based instrument by provincial stakeholders?**

1. Payments for Forest Ecosystem Services (PFES) is a breakthrough in Son La forest management (*Chính sách chi trả tiền dịch vụ môi trường rừng (DVMTR) là bước đột phá trong việc quản lý bảo vệ rừng*) (Sai Gon Giai Phong Online, 2019).
2. PFES schemes help to shift the budget burden for forest protection from state to non-state actors (To et al., 2012)
3. One objective of PFES is to completely remove State's subsidies for forest protection activities (Nguyen Tuan Phu, 2008).
4. PFES has created economic linkages between providers and users of forest environmental services (*Chi trả DVMTR .... tạo ra mối quan hệ kinh tế, gắn kết các bên cung ứng với bên sử dụng và hưởng lợi từ DVMTR*). (Pham Hong Luong, 2017).
5. In the long run, PFES shall be a complete market-based mechanism with shrinking role of the State (*Về lâu dài, tất yếu DVMTR sẽ là cơ chế hoàn toàn điều tiết giữa bên mua và bên bán, giảm dần vai trò điều tiết của nhà nước*) (Ha Cong Tuan, 2017)
6. PFES revenue is relatively new but has become an important and sustainable financial source for forestry sector in Son La province (*Tại Son La.....chính sách thực hiện chi trả dịch vụ môi trường rừng đã mang lại nguồn tài chính ổn định và vững chắc cho công tác bảo vệ và phát triển rừng tại địa phương*) (Industry and Trade Magazine, 2017)
7. PFES policy implementation is a further step towards forestry socialisation (*Chính sách chi trả DVMTR được thực hiện với mục tiêu xã hội hóa công tác bảo vệ rừng*) (Mai & Vu, 2018)
8. PFES is a mean to collect additional resources for forestry sector (*Chính sách chi trả DVMTR khẳng định hướng đi đúng trong việc tạo nguồn lực bổ sung cho ngành Lâm nghiệp thông qua sáng kiến tạo cơ chế tài chính mới*) (VNFF, 2017)
9. PFES is a mechanism to encourage the incorporation of financial incentives as part of the government's national strategy regarding natural resource management (Suhardiman et al., 2013)
10. The State plays an important role in regulating PES schemes (*Nhà nước đóng vai trò quan trọng trong việc điều tiết các mô hình chi trả dịch vụ môi trường*) (Le Van Hung, 2013)
11. The State would use additional (financial) resources to gain greater control in forest and watershed management (Suhardiman et al., 2013)
12. PFES is designated as a supplementary source to State's forest management budget but in reality it has been gradually substituting the State budget. (Interview, R18)
13. Private sector provides payments to comply with Government' request (Interview, R12)

14. State agencies pay more attention on how to increase PFES revenue than how to reinforce public-private collaboration in PFES implementation (Ngo Anh Tuan, 2015)
15. PFES plays a role to fulfill a shortfall of public funds in forest protection (To et al., 2012)
16. The PFES programme creates incentives for individuals and communities to protect environmental services by compensating them for any costs incurred in managing and providing those services (Pham et al., 2013).
17. There is a need to move away from the command-and-control approach towards a decentralized design that promotes service providers' and users' own sense of responsibility and mutual accountability (Hess & To, 2011)
18. The implementation of PFES programs has little to do with the idea of privatisation (Suhardiman et al., 2013)
19. PFES payments derived may provide a strong incentive for state entities to hold on to the land, capturing the benefit streams associated with PES (To et al., 2012)
20. PFES offer an opportunity to enhance the role of State-owned forest entities, and to improve their relationship with local authorities and forest communities through sub-contracts for forest protection (*Chi trả DVMTR tạo cơ hội giúp cải thiện vị thế và mối quan hệ của các Ban quản lý rừng với cộng đồng, chính quyền địa phương thông qua hoạt động khoán QLBR*) (Nguyễn Việt Dũng & Nguyễn Hải Vân, 2016)
21. PFES is paid to local community, not subcontracted (Interview, R17)
22. Companies pay (to PFES fund) because they think it is good for the forest (Interview, R12)
23. In PFES implementation, there is almost no linkage between hydropower companies and forest dwellers (*Mối quan hệ "thủy điện – người dân" gần như không tồn tại*) (Tran Nam Thang et al., 2015)
24. Building mechanism to support direct negotiation among service users and service suppliers is needed (Chi et al., 2017).
25. PFES revenue is sometimes mistakenly seen as a part of State budget and managed accordingly (*Nhiều cán bộ vẫn xem chi trả DVMTR là một nguồn ngân sách nhà nước và vận dụng cơ chế quản lý ngân sách nhà nước vào quản lý nguồn tiền này*) (Nguyen Huu Dung, CIFOR Consultation Workshop November 2020)
26. Government discourse on the 'success' of PES has served as an effective vehicle to expand state power in relation to forest resources (To and Dressler, 2019)
27. PFES policy has laid out preliminary foundation to apply market-based policy in forest management to replace command – and – control approach used in a long history (Chi et al., 2017)
28. ES users (hydropower and water supply companies) are very rarely informed about PFES (Interview, R12)
29. Participation of non-state actors such as CSOs, international non-governmental organisations (INGOs) and the private sector in the designing and monitoring of PFES can also help to ensure the accountability of the program (Pham et al., 2016)
30. The most significant differences of PFES to previous forest protection policies are that it covers larger forest areas and financial flow is much more stable and predictable (Interview, R10)

31. NGO has engaged in PFES by carrying out relevant studies to evaluate impacts of PFES on people's livelihood, gender equality, etc ([Interview, R19](#))
32. Apart from transferring money to PFES fund, private sector does not play any role in PFES implementation, while CSOs are not allowed in supervising and monitoring PFES implementation ([Interview, R20](#))
33. PFES has done nothing to decentralisation of forest management in Son La ([Interview, R10](#))
34. The Son La Forest Protection and Development needs to enhance it's connection with private sectors to further support local communities ([Interview, R9](#))
35. Private sector wants to directly pay service providers instead of indirect payment (through entrusted body) ([Interview, R12](#))
36. The direct payment applied to aquaculture and tourism sectors is not appropriate as no one is assigned to take care of negotiation and monitoring (*các đối tượng nuôi trồng và du lịch áp dụng hình thức chi trả trực tiếp không hợp lý vì không có đơn vị nào được giao đi xác định để đàm phán chi trả hoặc giám sát*) ([Interview, R11](#))
37. PFES enhance the role of local communities in making decision on how to use "revenue" from forest protection, not in forest governance power in general ([Interview, R17](#))
38. Payment obligation should be expanded to all people in the society as they all enjoy benefit from forest ([Interview, R10](#))
39. Forest management burden of local authorities was reduced and partly transferred to local communities ([Interview, R3](#))
40. Organisational forest owners such as protected forest management boards should be authorized to decide payment rate in their forest protection sub-contracts with households ([Interview, R10](#))

## **Research question 2 – How have local stakeholders perceived performance of PFES policy implementation?**

41. In general, the acceptance of society to PFES is rather high ([Son La portal, 2019](#))
42. Public understanding and support to PFES are still limited ([Tran Nam Thang et al., 2015](#))
43. The participation of households in PFES for improving their livelihoods and contributing to the poverty reduction is a big success of the PFES policy implementation in Son La ([Son La online, 2020](#))
44. Villagers' commitment to PFES has been increasing since its implementation in Son La ([Pham et al., 2018](#)).
45. PFES has helped to reduce both number and magnitude of forest law violence in Son La province (*Kể từ khi thực hiện chi trả DVMTR, tình hình phá rừng, lấn chiếm đất rừng, khai thác lâm sản trái phép trên địa bàn tỉnh giảm đáng kể về số vụ và mức độ thiệt hại*) ([Luong Thai Hung, quoted by Natural Resources and Environment Magazine, 2016](#))
46. PFES revenue has been higher than State's budget investment for forest protection in Son La (*Tổng số tiền thu ủy thác từ các đơn vị sử dụng dịch vụ môi trường rừng lớn hơn ngân sách hàng năm đầu tư cho chương trình bảo vệ và phát triển rừng của tỉnh Sơn La*) ([Interview, R16](#))

47. Slash and burn practices have been reduced since PFES implementation (*Từ khi có PFES việc phá rừng làm nương rẫy không còn phổ biến như trước*) (Interview, R13)
48. The decline in number of forest cutting cases can not be solely attributable to PFES but also to other State-support programs (on poverty alleviation and forest protection) and the fact that local forest resources are already depleted (*việc hộ dân chưa phát rừng hoặc không phát rừng từ ngày có PFES không phải trực tiếp do PFES mà là do nhiều chương trình nhà nước khác... và do rừng đã cạn kiệt*) (Pham et al., 2018)
49. PFES has helped to reduce the number of forest fire cases in Son La (Dan Sinh Newspaper, 2016)
50. The PFES program there effectively changes local people's forest management (Duong & De Groot, 2020)
51. PFES helps to reduce agricultural cultivation on forest land (Interview, R13)
52. PFES payment could encourage some communities to plant forest if combined with other in-kind payments (Interview, R17)
53. PFES has helped to increase forest cover in Son La significantly (Dan Sinh Newspaper, 2016)
54. At a province level, PFES has not been proven effective in reducing deforestation (*Ở quy mô cấp tỉnh, PFES chưa thực sự hiệu quả trong việc giảm diện tích rừng bị mất*) (Pham et al., 2018)
55. Forest quality of PFES villages is improved compared to non-PFES villages (*Chất lượng rừng đã được cải thiện tại những bản có chi trả DVMTR so với các bản không có chi trả DVMTR*) (Pham et al., 2018)
56. PFES has contributed to poverty eradication in Son La (Son La online, 2020)
57. The average household forest landholding in Son La Province (about 2 ha) is too small to generate sufficient income to persuade farmers to conserve or expand the forested area (Lan et al., 2016)
58. PFES is not much helpful for poor household to escape from poverty (*Chi trả DVMTR không giúp được nhiều trong việc giúp các hộ nghèo thoát nghèo*) (Pham et al., 2018)
59. In some places, environmental targets of PFES have been diminished in exchange for local social targets (*Ở một số nơi mục tiêu môi trường của chính sách chi trả DVMTR đã được đánh đổi với mục tiêu xã hội về giảm nghèo*) (Pham Thuy Thuy, CIFOR Consultation Workshop November 2020)
60. PFES policy does not have a significant contribution to forest protection, but even increases social conflicts in the local community (Truong et al., 2017)
61. PFES has encouraged local people to actively engage in village's cultural and social activities (Interview, R1)
62. The effectiveness and efficiency of PFES in the aspects of environmental and social performance of have not yet been proven due to lack of an independent monitoring, reporting and verification system (Nguyễn Việt Dũng and Nguyễn Hải Vân, 2016)
63. Only about a small number of village households gained access to PFES benefits, whereas ones who only held unrecognized customary tenure without a contract were excluded from benefits (To et al., 2012)



64. PFES policy has not created enough incentive to forest owners to invest in reforestation (Chi et al., 2017)
65. Local people have more actively participate in PFES than previous forestry programs such as 661 (Interview, R9).
66. PFES payment should be concentrated in some hot spots of deforestation to be more effective (Interview, R12)
67. To promote sustainable PFES in Son La, it is necessary to identify institutional options that reduce transaction costs and organisational problems (Milan et al., 2017)
68. PFES is likely to be unable to tackle several of the key underlying causes for deforestation and forest degradation, namely, uneven land tenure and a lack of participation by local communities in conservation (McElwee, 2012)
69. PPES revenue has helped State-owned Forest Enterprises (SFEs) in Son La to revive their activities (*Chi trả DVMTR...giúp các công ty lâm nghiệp đứng vững, khôi phục sản xuất, có kinh phí hoạt động*) (VNFF, 2017)
70. A large number of forest owners (43,000) greatly increases transaction costs of PFES in Son La (Interview, R20)
71. The PFES management accounting system lacks transparency, and data on incomes and expenses have not been made publicly available. (Truong, 2017)
72. Credible data showing PFES as having a positive impact on local incomes is lacking (Pham et al., 2013)
73. PFES payment has significantly contributed to local income, particularly in remote areas (*Nguồn thu chi trả DVMTR rừng đã góp phần không nhỏ vào việc ổn định đời sống của người dân, nhất là ở các vùng sâu, vùng xa, vùng đặc biệt khó khăn trên địa bàn tỉnh Sơn La*) (VEAM, 2017)
74. Although Son La aims to increase its forest cover annually, PFES results showed the opposite trend (Interview, R20)
75. PFES helps local farmers in Son La to reduce their financial responsibility for other local development programs (Interview, R3)
76. PFES is less effective than other programs such as 30A in terms of poverty alleviation (Interview, R5)
77. It is possible that a part of PFES fund is lost through the long payment procedure (Interview, R5)
78. PFES has helped communities in Son La to develop local infrastructure (Interview, R5)
79. Flat rate payment to all forest-owners is not effective to protect forest (Interview, R12)
80. The most important achievement of PFES in Son La is that forest holders' awareness and responsibility for forest protection has been enhanced (Interview, R11)

**Research question 3 - To what extent is FPES blended with pre-existing policies and institutions?**

81. There is a risk of application of a simple top-down approach, in which the national legislature steers PFES without taking the differences between local contexts (of Son La) into consideration (Pham et al., 2013)
82. PFES has led to the formation of a new institutional structure based on the local pre-existing forest management institutions and arrangements (*Chi trả DVMTR đã hình thành nên các cơ cấu, chức năng và mối quan hệ mới dựa trên nền tảng hệ thống tổ chức – thể chế QLBR hiện tại của địa phương*) (Nguyễn Việt Dũng and Nguyễn Hải Vân, 2016)
83. PFES is yet to be integrated into the province' financial plan (Interview, R11)
84. PFES is not integrated into local planning at all (Interview, R7)
85. PFES payment helps to build consensus of local communities in implementing other policies in the same location (Interview, R17)
86. The basic unit to integrate PFES plan into provincial forest protection and development plan is forest protection and development plans of organisational forest owners and State-entrusted institution for forest management (*Đơn vị cơ sở để lồng ghép kế hoạch chi trả DVMTR với kế hoạch BVPTTR phải là các chủ rừng là tổ chức và các tổ chức không phải chủ rừng nhưng được giao quản lý rừng (chủ yếu là các UBND cấp xã).* (VNFF, 2016)
87. Local pre-existing forest protection institutions were activated thanks to PFES financial flow (Interview, R7)
88. There found no conflicts between PFES and other policies (Interview, R16)
89. PFES builds on a well-implemented forest law that effectively blocks forest conversion (Duong & De Groot, 2020)
90. At province level, PFES revenue has been significantly contributing to implementation of provincial REDD+ action plan (Yamamoto et al., 2019)
91. In practice, there is a fragmentation between the policy of forest protection (supported by PFES policy) and forest development (support by Plan 57). (Chi et al., 2017)
92. The current position of PFES fund in the political system limits its ability to enforce payment collection (Pham et al., 2013)
93. The lack of a formal channel for submitting claims and grievances (of PFES) serves to reinforce inequity among stakeholders (Pham et al., 2013).
94. Engagement of Commune's People Committees in implementing and monitoring PFES is very low (*Chính quyền địa phương hay UBND xã mới chỉ tham gia ở mức thấp (phối hợp hỗ trợ) chứ chưa thực sự tham gia trực tiếp vào quá trình chi trả DVMTR*) (Tran Nam Thang et al., 2015)
95. In many cases, PFES did not get adequate attention and was not integrated well into commune's socio-economic development plan (*Ở cấp xã, trong nhiều trường hợp, chính sách chi trả DVMTR chưa được coi trọng cũng như được lồng ghép chặt chẽ vào các quy hoạch, kế hoạch phát triển kinh tế - xã hội của xã*) (Nguyễn Việt Dũng and Nguyễn Hải Vân, 2016)
96. District level authorities do not have motivations to participate in PFES implementation (*Cấp huyện cho rằng vai trò của họ rất mờ nhạt và ko có động lực tích cực để tham gia thực hiện PFES*) (Interview, R20).
97. PFES has been complimentary to existing policies in Son La such as the "national target programme on new-style rural area building" (*chi trả tiền dịch vụ*

- môi trường rừng (DVMTR) trên địa bàn tỉnh Sơn La... góp phần quan trọng trong công cuộc xây dựng nông thôn mới*) (Natural Resources and Environment Magazine, 2016)
98. Son La's PFES policy is not fully compatible with Forestry Law (2017) as the province allowed mass organisation to receive, manage and utilise PFES revenue while Forestry Law does not recognize them as legal forest holders (VEAM, 2019)
  99. The PFES Fund's technical and personnel capacity is limited and it has to rely on collaboration with technical divisions of DARD (*Quy (BVPTTR) chưa đủ năng lực về chuyên môn và nhân lực để thực hiện hết các đòi hỏi, yêu cầu của công việc mà phải phối hợp với các đơn vị chuyên môn của sở NNNPTNT*) (Tran Nam Thang et al., 2015)
  100. There is a lot of overlaps between PFES fund and the forest protection department in terms of forest monitoring and assessment system (Interview, R18)
  101. Adjusting land use plan to expand fruit tree plantation areas could lead to detrimental impacts on forest area and effectiveness of PFES in some places (Pham Thu Thuy et al., 2018)
  102. Directly affiliated to Son La's PPC, The PFES Fund currently is acting as the second financial department of the province but for only the forestry sector (Interview, R18)
  103. PFES has yet to be integrated into forestry sector planning at commune level due to lack of guidance and implementation mechanism (Nguyễn Việt Dũng & Nguyễn Hải Vân, 2016)
  104. Forest Protection Station's (FPS) role as focal point for PFES fund distribution to local households has threatened the objectiveness of forest protection reporting that is also done by FPS (*Hạt kiểm lâm bị xem là đang "vừa đá bóng, vừa thổi còi" khi họ vừa là cơ quan lập hồ sơ chi trả, vừa đánh giá nghiệm thu và chi trả, trong khi lại đang chịu trách nhiệm giám sát, quản lý các chủ rừng và hiệu quả QLVR tại địa phương*) (Nguyễn Việt Dũng & Nguyễn Hải Vân, 2016)
  105. Trust and accountability can be built through participatory development of a transparent monitoring and evaluation program that is integrated into PFES (Pham et al, 2013).
  106. There has been a lack of mechanism for PFES to be well aligned with other policies/programs/initiatives targeting the same forest dwellers (*Cũng vì chưa có cơ chế chia sẻ nên không thể kết nối và lồng ghép với các nguồn lực và sáng kiến khác có cùng mục đích như hỗ trợ phát triển sinh kế cộng đồng vùng đệm để thực hiện đồng quản lý rừng*) (Interview, R5)
  107. There is no guidance on how to use PFES revenue to develop capacity of staff involved in PFES (Interview, R9)
  108. PFES, by its regulations, has led to better collaborations between line departments than before (*Chi trả DVMTR với các quy định phối hợp giữa các ban ngành làm cho các ban ngành ở tỉnh tăng cường phối hợp hoạt động với nhau hơn trước kia*) (Pham Thu Thuy, CIFOR consultation workshop November 2020)
  109. The responsibilities (regarding PFES) at the different levels of the administrative system still have to be clearly defined (Interview, R11)
  110. It will be better if PFES revenue can be used for other livelihood improvement activities (NTFPs and agroforestry development) (Interview, R11).

111. Involving NGOs, CSOs and local community representatives (rather than only designated government agencies) in PFES fund structure may improve PFES program delivery by increasing transparency (Pham et al., 2013)
112. PFES will be more effective if combined with other development support programs (*Cần có sự phối hợp và hỗ trợ với các chương trình khác như chương trình nông thôn mới, xóa đói giảm nghèo (30A) để có hiệu quả tốt hơn*) (Interview, R5)
113. Current PFES legislation interferes with social norms of distributive fairness (Loft et al., 2019)
114. If PFES is mainstreamed into local planning, State's budget allocation for local forest protection will likely be cut (Interview, R15)
115. PFES payment has strongly support community forestry policy in Son La (Interview, R18)
116. Forestry sector's plan of Son La has included PFES, but only by a few ambiguous sentences (Interview, R5)
117. PFES is now included in villages' regulations (Interview, R1)
118. PFES is not supporting and not included in village's regulation (Interview, R5)
119. The organisational structure of PFES should be maintained as it is now (Interview, R4).
120. PFES offers an opportunity to re-arrange forest ownership in Son La (from households to communities) for better management (*Chi trả DVMTR dẫn đến những thay đổi lớn trong thể chế quản lý lâm nghiệp ở địa phương, đặc biệt là sắp xếp lại các chủ rừng*) (Interview, R18)

**Research question 4 - Is participation (of farmers) to PFES a response to PFES's incentive?**

121. Communities, household groups and individuals are enjoying the most benefit from PFES (*Các cộng đồng, nhóm hộ gia đình và cá nhân đang hưởng lợi nhiều nhất từ PFES*) (Pham et al., 2018).
122. PFES payments not only induced a higher motivation for forest management but also strengthened community capacities for forest protection (Duong & De Groot, 2020)
123. There is inequality in PFES participation, as only strong and young male villagers are selected for forest patrolling groups, and therefore these men are the main PFES beneficiaries (Loft et al., 2019)
124. PES payments were not reaching the poorest households (To et al., 2012)
125. While much of the PFES budget for the village goes to purchasing patrol equipment and paying forest patrols, only a small amount of PFES budget, if at all, is left to help improve local livelihoods (Mekong Commons, 2018).
126. Local people should no longer be considered as low-cost laborers, but as equal partners and a driving force in forest protection (*Cần thay đổi nhận thức, quan điểm coi người dân địa phương là nguồn lao động giá rẻ, mà cần coi họ là những đối tác bình đẳng và là lực lượng chính trong bảo vệ, quản lý và phát triển rừng*) (Hess and To, 2011)
127. Local people only know well PFES payment amount (Interview, R15)

128. Most households did not know which forest protection activities they are required to comply with under PFES (Le et al., 2016)
129. Villagers' awareness on PFES is still low, especially for ethnic groups in remote areas (*Nhận thức của người dân về công tác chi trả DVMTR chưa cao, đặc biệt là đối với đồng bào dân tộc thiểu số vùng sâu, xa*) (Interview, R13)
130. While payments are not perceived to be the key motivational factor for local people to participate in PFES, they are useful in rewarding local people for their efforts in forest protection (Le et al., 2016)
131. Awareness raising activities for PFES have not been developed based on actual information needs of relevant stakeholders (*Các hoạt động truyền thông tăng lên qua các năm nhưng chỉ tập trung vào tờ rơi và áp phích không được phát triển xây dựng dựa trên các nhu cầu về thông tin của các bên có liên quan*) (Pham et al., 2018).
132. There is a need to use more leaflets to enhance local awareness (Interview, R14)
133. Most of the households benefited from PFES are aware of that this money is paid by the PFES users (Nguyen & Vuong, 2016)
134. Currently, money from PFES does not correspond to the labour value and minimum living costs of the local people (Nguyen & Vuong, 2016)
135. PFES payment is the key motivation for local communities' participation in forest protection and development (Son La Online, 2020)
136. PFES policy provided attractions of forest protection activities to local labours, especially those in remoted areas (*Chính sách DVMTR đã thu hút lực lượng lao động lớn trong dân, nhất là vùng sâu, vùng xa, vùng đặc biệt khó khăn trực tiếp tham gia bảo vệ rừng*) (Son La Portal, 2019).
137. Not all villagers wanted to participate in PFES as some will lose their opportunities to exploit NTFPs and thus their income (*Không phải ai trong bản cũng muốn tham gia PFES vì khi tham gia PFES, các hộ này sẽ không được khai thác lâm sản ngoài gỗ và do vậy sẽ ảnh hưởng đến thu nhập của họ*) (Pham et al., 2018).
138. Roles and responsibilities of households and communities in PFES contracts are not clearly defined, leading to the risk of forest conversion (*Vai trò & trách nhiệm của bên nhận giao/khoán đặc biệt là hộ gia đình, cộng đồng, nhóm hộ chưa rõ ràng nên dễ xảy ra tình trạng rừng bị mất hoặc bị chuyển đổi*) (Tran Nam Thang et al., 2015)
139. Many farmers can not differentiate PFES from other State support programs (Le et al., 2016)
140. PFESs contractual and general information is only available in the Kinh language (the main language of largest ethnic population group in Vietnam) leading to a risk of misunderstanding for minority ethnic groups and a low compliance of PFES contracts. (Pham et al., 2013)
141. Participation of local people should be promoted through empowering local people to voice their views during decision-making and to monitor the PFES program (Hess & To, 2011)
142. PFES is considered by households as a subsidy-like non-conditional social welfare programme of cash transfers from the state. (McElwee et al., 2020)
143. PFES payments do not incentivize significant behavioral change of local households and communities (McElwee et al., 2020)

144. Local ES providers had low participation in the collective decision-making process at various stages by their absence in the formulation process of the forest protection agreement (informal PFES contract) (Le et al., 2016)
145. Participating farmers as ES providers decide voluntarily whether or not they want to participate in the PES scheme (Phan et al., 2018)
146. PFES services providers have not fully understood their rights and benefits (Ngo Anh Tuan, 2015)
147. In some community forests, households receive PFES payment without participating in forest patrolling (Điện Biên Phủ online, 2019)
148. Local people protect forest as complying to their villages' regulation rather than because they receive PFES payment (Interview, R2)
149. No one would participate in forest protection without PFES payment (Interview, R1)
150. Smallholders are paid by PFES based on the size of actual forest they own, not by forest protection activity they perform (Interview, R17)
151. The State should raise payment rate to better support local income (Interview, R3)
152. PFES revenue should be spent more on social welfare and road development than allocating to households (Interview, R4).
153. Even if their forest area declined, many households' PFES payment has increased due to adjustment in payment rate and this discouraged them in participating in forest protection activities (Pham et al. 2018).
154. Some households do not even bother receiving PFES payment as the payment rate was too low (Interview, R7)
155. Payment to the whole commune will be more effective than individual payment as total budget will be more sufficient for livelihood activities (Interview, R5)
156. Son La needs to be authorized to adjust payment rates among watersheds to reduce (large) difference in payment rates applied to different sub-watersheds (Interview, R11)
157. Different payment rates applied for different watershed has created doubts and jealousy for forest holders and contractees in low-paid watersheds. (*Hiện đơn giá chi trả bình quân DVMTR trên 1ha rừng đang có sự chênh lệch, khiến người dân so bì*) (Interview, R16).
158. If payment rate is too high it will make some local households become too dependent on FPES support and less active in involving in other economic activities (Interview, R13)
159. PFES negatively affected livelihoods of HMong people as their traditional production activities are often detrimental to forest (Interview, R9)
160. PFES has helped many households to secure their living by forest protection and maintenance (*Chi trả DVMTR giúp nhiều hộ gia đình đã có thể sống được bằng nghề chăm sóc bảo vệ rừng*) (Dan Sinh Newspaper, 2016)

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## Annex 2: Instructions to Q-sorting

### Instructions for online Q participants in Q-sorting

Please read the instructions carefully. Q-sorting is not difficult, and this online-platform makes it easy for you, but you do need to give it your full attention so that the Q-sort you submit reflects your personal viewpoint accurately. For next steps, please follow instructions below

Each Q-sorting consist of 2 main steps:

- **Step 1: Pre-sort the statement.**
  - You need to first read all the statements first. Then, go back to the first statement, and drag it to one of the boxes that corresponds with your feeling, belief, or attitude about the statement.
  - You will need to drag each statement to the box that aligns most with your view. You can only move to the next step if all the statements are put into boxes
  - There are 40 statement cards in this sorting practice. Please feel free to distribute those into three boxes in the way you want.
  - Don't worry about making mistakes at this stage. You can change the sorting and ranking of each statement in the next step.
- **Step 2: Sort and rank the statements onto the grid**
  - Drag and drop each card onto the distribution grid.
  - Click the reset button to return all the statements to the three piles and start over. If you click reset, a confirmation dialog opens. Click **Yes**.
  - Please kindly note that at the end of your sorting: (i) each of "Most Agreed" and "Most Disagreed" boxes should have exactly 1 cards; (ii) each of "Very much agreed" and "Very much disagreed" boxes should have exactly 3 cards; (iii) each of "Fairly Agreed" and "Fairly Disagreed" boxes should have exactly 5 cards; (iv) each of "Slightly Agreed" and "Slightly Disagreed" boxes should have exactly 7 cards; and (v) the "Neutral" box should have exactly 8 cards.
  - Review your Q-sort: When you're done placing the statements onto the distribution grid, review your Q-sort. Drag and drop the statements to reorder them, if you wish.
  - Submit your Q-sort: When you're happy with the Q-sort, click the **Submit** icon.

**IMPORTANT:** There are no right or wrong answers. The best answer is the one that reflects *your* subjective opinion, belief, or feeling.

## Annex 3: Composite Q sort for factor 2, Q-set 1

Composite Q sort for Factor 2

-4	-3	-2	-1	0	1	2	3	4
***◀ State agencies pay more attention on how to increase PFES revenue	***◀ In the long run, PFES shall be a complete market-based mechanism with	***◀ Building mechanism to support direct negotiation among service	PFES plays a role to fulfill a shortfall of public funds in forest	PFES schemes help to shift the budget burden for forest	NGO has engaged in PFES by carrying out relevant studies to	***▶ Government discourse on the success of PES has served as an effective	***▶ PFES revenue is relatively new but has become an important and sustainable	Payments for Forest Ecosystem Services (PFES) is a
	***◀ Private sector wants to directly pay service providers	The PFES programme creates incentives for individuals and	***▶ PFES is paid to local community, not subcontracted	In PFES implementation, there is almost no linkage between	***▶ Participation of non state actors such as CSOs, international	***▶ PFES is a mechanism to encourage the incorporation of financial	***▶ PFES offer an opportunity to enhance the role of State owned forest	
***◀ PFES revenue is sometimes mistakenly seen as a part of State budget	***▶ PFES enhance the role of local communities in making decision	***◀ PFES policy implementation is a further step towards forestry	Forest management burden of local authorities was reduced and	The State plays an important role in regulating PES schemes	PFES is designated as a supplementary source to State forest	PFES is a mean to collect additional resources for forestry sector		
	***◀ Companies pay (to PFES fund) because they think it is good for the	The implementation of PFES programs has little to do	There is a need to move away from the and-and-control approach	***▶ Payment obligation should be expanded to all people in the	The Son La Forest Protection and Development needs to			
	***◀ Private sector provides payments to comply with Government	***▶ PFES has done nothing to ecentralization of forest management in	***▶ ES users (hydropower and water supply companies) are very rarely	***▶ PFES has created economic linkages between	***▶ One objective of PFES is to completely remove State subsidies for			
		***◀ The State would use additional (financial) resources to gain greater	The most significant differences of PFES to previous forest	***▶ The direct payment applied to aquaculture and tourism sectors is not				
		Organizational forest owners such as Protected forest	PFES policy has laid out preliminary foundation to apply market	PFES payments derived may provide a strong incentive for				
			***▶ Apart from transferring money to PFES fund, private sector does not					

### Legend

- \* Distinguishing statement at  $P < 0.05$
- \*\* Distinguishing statement at  $P < 0.01$
- ▶ z-Score for the statement is higher than in all other factors
- ◀ z-Score for the statement is lower than in all other factors

## Annex 4: Land use change matrix 2005–2015 in Na Nhan commune, Dien Bien province

2015 land use/ cover types	2005 land use/cover types									Total 2015
	EBF - rich	EBF - medium	EBF - poor	Planted forest	Bare land with scattered trees	Bare land with grass and shrubs	Tree crop plantation	Annual crops	Water bodies and other land uses	
EBF - rich	0	0	0	0	0	0	0	0	0	0.0
EBF - medium	0	137.6	20.4	0	0	0	0	0	0	158.0
EBF - poor	0	0.0	955.9	317.3	66.4	1,612.2	0	0	0	2,951.8
Planted forest	0	0	0	17.4	0	39	0	0.0	0	56.4
Bare land with scattered trees	0	0	0	0	710.4	0	0	0	0	710.4
Bare land with grass and shrubs	0	0	0	0	0	774.4	0	0	0	774.4
Tree crop plantation	0	0	0	0	0	0	47.8	0.0	0	47.8
Annual crops	0	0	0	0	0	918.8	0	1,747.2	0	2,665.9
Water bodies and other land uses	0	0	0	0	0	25.3	2.7	0	207.0	234.9
Total 2005	0.0	137.6	976.3	334.7	776.8	3,369.6	50.5	1,747.2	207.0	7,599.6

Source: Authors' work adapted from FIPI (2006, 2016)

Key: EBF = Evergreen broadleaf forest. The unit of area is hectares (ha)

## Annex 5: Survey questionnaires – Contingent Valuation Method

### QUESTIONNAIRE ON WILLINGNESS TO PAY OF ELECTRICITY AND WATER USERS IN DA NANG CITY FOR RELIABLE ELECTRICITY/WATER SUPPLY

ID \_\_\_\_\_

My name is \_\_\_\_\_, I am working for \_\_\_\_\_ and we are conducting a survey to assess the willingness to pay of water users and domestic electricity users in Da Nang for reliable electricity/water supply through forest protection and increased upstream forest cover in the basin surrounding Song Thanh Nature Reserve and some other basins in the upper Vu Gia-Thu Bon river. Your family is randomly selected in this survey. The interview may take 20-30 minutes and your participation is voluntary—you can decide not to take part in this survey. All the information you give will be treated with anonymity and confidentiality. If you have any questions or concerns regarding the survey, feel free to ask me or my supervisor who is here with the survey team.

Can we continue with interview? Yes [ ☐ ] No [ ☐ ]

If the answer is yes, continue. If no, then stop and politely thank the respondent.

Questionnaire Number: \_\_\_\_\_ Date of Interview: \_\_\_\_\_

Name of Respondent: \_\_\_\_\_ Tel: \_\_\_\_\_

Address: house number: \_\_\_\_\_ Street name: \_\_\_\_\_ Ward: \_\_\_\_\_;  
District: \_\_\_\_\_

Interview start time: \_\_\_\_\_

### PART I – INFORMATION OF RESPONDENT

1.1. Age \_\_\_\_\_

1.2. Sex: Male [ ☐ ] Female [ ☐ ]

1.3. How long have you been living in Da Nang city? \_\_\_\_\_

1.4. Please indicate the highest regular education program that you have completed?<sup>1</sup>

<sup>1</sup>Educational level: 0 – no formal schooling; 1 – primary school (1 → 5 year); 2 – secondary school (5 → 9 years); 3 – Highschool (10 → 12 years); 4-Vocational training; 5 –College; 6 – University; 7- Post-graduate



## PART II – ATTITUDE AND AWARENESS ON ENVIRONMENTAL PROTECTION

Question	Answer
2.1 Do you agree that human beings should be responsible to protect the nature?	a-Fully agree b-Agree c-Neither agree nor disagree d-Disagree e-Fully disagree
2.2 Do you agree that technologies will help us to address environmental problems in the future?	a-Fully agree b-Agree c-Neither agree nor disagree d-Disagree e-Fully disagree
2.3 Do you know Song Thanh Natural Reserves?	Yes [ ] No [ ]
2.4 Do you find that upstream conservation activities can increase water supply to downstream users?	Yes [ ] No [ ]
2.1 Do you agree that human beings should be responsible for environmental protection?	Yes [ ] No [ ]

**Note** \_\_\_\_\_

## PART III – WATER SUPPLY

Question	Answer
3.1 Please indicate your water supply sources? (please mark all appropriate options)	a-Rain water [ ] b-Bore water [ ] c- [ ] d-Well water [ ] e-Other (specify)_____
3.2 Please name the water supply company on your monthly water bill	
3.3 If the answer is water supply company: how many percent of your household's water consumption is provided by the company?	
3.4 How much water is consumed by your household based on a monthly average? (m <sup>3</sup> )	
3.5 If the answer is water supply company: which company is it?	
3.6 Does the Da Nang's water supply system provide sufficient water to the need of your household?	Yes [ ] No [ ]
3.7 If yes to the above: In the last six months, has your household experienced water shortage?	Yes [ ] No [ ]
3.8 If yes to the above, how did water shortage happen? (for example, water supply was cut (1) daily, (2) weekly, (3) monthly or (4) longer)	Yes [ ] No [ ]
3.9 Has your household taken any measure to address water shortage? (for example, buy bottled water, harvest rain water, buy larger water tanks, etc.)	Yes/No
3.10 If yes, please specify	
3.11 How much did those measures cost??	

**Note** \_\_\_\_\_

## PART IV – ELECTRICITY SUPPLY

	Question	Answer
4.1	Please name the electricity company on your monthly electricity bill	
4.2.	The average monthly electricity consumption (KWh):	
4.3	Does the Da Nang's power system provide sufficient water to the need of your household?	Yes [ ] No [ ]
4.4	In the last six months, has your household experienced electricity shortage?	Yes [ ] No [ ]
4.5	If yes to the above, how severe was it? (for example, electricity supply was cut (1) daily, (2) weekly, (3) monthly or (4) longer)	
4.6	Has your household taken any measure to address electricity shortage? (for example, adopt solar power system, go to a nearby coffee shop to use electricity there, buy UPS device, etc.)	Yes [ ] No [ ]
4.7	If yes, please specify	
4.8	How much did those measures cost??	

**Note** \_\_\_\_\_

## PART V- CONTEXT OF PAYMENT FOR FOREST ENVIRONMENTAL SERVICES

In Vietnam, there is a Policy on Payment for Forest Environmental Services (PFES) according to Decree 99/2010 of the Government. The program pays forest land users to manage their land to provide forest environmental services such as water regulation, biodiversity conservation, etc. The PFES fund gets contributions from a variety of sources. This payment is part of the current environmental fee you are paying in your electricity and water bill.

In Quang Nam province, there are many water supply basins connecting to Da Nang city through the Vu Gia-Thu Bon river system. Upstream land users receive payments for forest protection to improve water supply to downstream users such as the Cau Do Water Supply Plant and the Song Bung Hydropower Plant. However, the amount paid is low and likely not enough to encourage many land-owners to participate in the program.

As a citizen of Da Nang using water from Cau Do water plant and electricity from hydropower plants in the upstream of Thu Bon river, you and your family members will benefit from this program.

## PART VI- WILLINGNESS TO PAY FOR WATER SUPPLY

Suppose you are told that the unreliable and inadequate water supply can be solved by better regulation of Vu Gia-Thu Bon river system's flow to the Cau Do water supply plant. This can be achieved by increasing tree cover on the watershed of Song Thanh Nature Reserve and other forests in the basin. Land users in the area should be compensated for measures to use land in more sustainable ways such as increase tree cover on their land. Assuming you and other beneficiaries are required to pay for the costs of planting trees and maintaining tree cover to help improve the water supply, we would like to know if you would be willing to pay for the proposed plan. You will be required to pay a certain amount monthly for three consecutive years. This amount will be added to the payment for environmental services in your current water bill (currently according to Decree 99 you are currently paying 40VND/m<sup>3</sup> of clean water). Please remember that you will pay to increase the reliability of the water supply, otherwise the current situation will not change. Please note that when you pay for an improved water supply, the money will not be used for any other purpose.

Question	Answer
6.1 Would you pay for that project?	Yes [ ] No [ ] If respondent choose NO, move to Part VII
<p><b>If yes to the above:</b> Would you be willing to pay additional VND/m<sup>3</sup> for a reliable water supply that makes you worry-free on water shortage? Starting bid is 90 VND/m<sup>3</sup> of water. If the answer is Yes, continue to raise to higher level (and stop as the respondent say NO); if the answer is No, continue to reduce the bid level (and stop as the respondent say YES)</p>	
50	Yes [ ] No [ ]
70	Note the immediate agreed bid before the respondent say NO _____
6.2 90 – Starting bid	
110	
130	
145	
150	
170	
210	
500 *	
*(this level is used in order to stop the respondent from saying YES)	

6.3	Do you agree that improving the conservation of the watershed around Song Thanh Nature Reserve can increase the water supply in Da Nang city?	a-Fully agree b-Agree c-Neither agree nor disagree d-Disagree e- Fully disagree
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### Note

## PART VII- WILLINGNESS TO PAY FOR ELECTRICITY SUPPLY

Suppose you are told that the unreliable and inadequate electricity supply can be solved by better regulation of Vu Gia-Thu Bon river system's flow to the reservoirs of downstream hydropower plants, for example Dak Mi 4 and Song Bung 4 hydropower plants. This can be achieved by increasing tree cover on the watershed of Song Thanh Nature Reserve and other forests in the basin. Assuming you and other beneficiaries are required to pay for the costs of planting trees and maintaining tree cover to help improve the electricity supply, we would like to know if you would be willing to pay for the proposed plan. You will be required to pay a certain amount monthly for three consecutive years. This amount will be added to the payment for environmental services in your current electricity bill (currently according to Decree 99 you are currently paying 20VND/KWh of electricity). Please remember that you will pay to increase the reliability of the water supply, otherwise the current situation will not change. Please note that when you pay for an improved water supply, the money will not be used for any other purpose.

Question		Answer
7.1	Would you pay for that project?	Yes [ ] No [ ] If NO, move to part VIII
7.2	<p><b>If yes to the above:</b> Would you be willing to pay additional VND/KWh for a reliable electricity supply that makes you worry-free on electricity shortage?</p> <p>Starting bid is 40 VND/KWh of electricity. If the answer is Yes, continue to raise to higher level (and stop as the respondent say NO); if the answer is No, continue to reduce the bid level (and stop as the respondent say YES)</p> <p>10</p> <p>30</p> <p><b>40 – Starting bid</b></p> <p>60</p> <p>90</p>	<p>Yes [ ] No [ ]</p> <p>Note the immediate agreed bid before the respondent say NO</p> <p>_____</p>

100

120

130

150

170

190

300\*

\*(this level is used in order to stop the respondent from saying YES)

7.3	Do you agree that improving the conservation of the watershed around Song Thanh Nature Reserve can increase the electricity supply in Da Nang city?	a-Fully agree b- Agree c-Neither agree nor disagree d-Disagree e- Fully disagree
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**Note** \_\_\_\_\_

## PART VIII – EXIT QUESTION

	Question	Answer
8.1	Can you please recommend any other means to secure reliable electricity and water supply for the city?	

**Note** \_\_\_\_\_

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**THANK YOU VERY MUCH FOR PARTICIPATING IN OUR SURVEY./.**

## Annex 6: Attributes defined for discrete choice experiment (final design)

Attributes	Unit	Levels	Explanatory note
Minimum land area subscribed to the program	ha	0.2; 0.4; 0.6	<p>To ensure effectiveness of the program, farmers who volunteer to join must subscribe a minimum land area for agroforestry development and receive incentives accordingly. Farmers are free to subscribe land area above the minimum.</p> <p>Tree seedling for agroforestry development in this land will either be provided through local nursery activities or by the program and farmers will not have to pay for seedlings in both cases.</p>
Upfront payment	VND/ha	4 mil; 7 mil; 10 mil	<p>Upfront payment is the amount of cash provided to farmers once they agree to participate in the program and proportional to their subscribed area. This is not subject to conditional clauses of the contract.</p> <p>Out of this upfront payment, there will be a conditional payment made annually based on farmers' performance. The amount of this conditional payment will be decided later based on resources availability and level of commitment of all parties.</p>
Technical support	No unit	Low; Medium; Full	<p><b>Low:</b> only classroom type of training before the project start</p> <p><b>Medium:</b> classroom type trainings plus field guides when farmers establish agroforestry plots</p> <p><b>Full:</b> classroom type trainings plus field guides when farmers establish agroforestry plots, and weekly field visit of project staff to help farmers manage their agroforestry plots</p>
Monitoring level	No unit	Strict, Moderate, Self-monitor	<p><b>Self-monitor:</b> farmers will observe tree growth and plot development by themselves and take record data in the field book.</p> <p><b>Moderate:</b> an elected board of community members will monitor and visit agroforestry plots every 6 months to check performance</p> <p><b>Strict:</b> a group of experts hired by the program will come and check performance of at least 80% of agroforestry plots annually and report to the program directly</p>

**Annex 7: SURVEY QUESTIONNAIRE (DISCRETE CHOICE EXPERIMENT) FOR WILLINGNESS TO ACCEPT**

**SURVEY QUESTIONNAIRE - CHOICE SET 01**

Village : \_\_\_\_\_ Enumerator: \_\_\_\_\_ District: \_\_\_\_\_  
Commune: \_\_\_\_\_; Sex \_\_\_\_\_; Age: \_\_\_\_\_; Education level \_\_\_\_\_  
Respondent's name: \_\_\_\_\_  
Name of household's head: \_\_\_\_\_; \_\_\_\_\_  
ID \_\_\_\_\_

	Conditions of the hypothetical contract (1-4)	OPTION A	OPTION B	OPTION C	STATUS QUO
	1. Minimum land area subscribed to the program (ha)	0.4	0.2	0.4	I do not want to adopt any of these three options (Nothing will change from what you are doing now)
	2. Initial payment (VND mil/ha)	4	7	10	
	3. Technical support level	Medium	Low	Medium	
	4. Monitoring and reporting	Community	Community	Self-monitoring	
C1	Which option do you prefer? (Please mark X on your preferred option)				
C2	If you do not want to adopt any of these options, if possible, please let us know which seems to be most reasonable to you, and why				

**NOTES (FOR ENUMERATOR ONLY, PLEASE DO NOT FILL IN THIS PART)**



# **SURVEY QUESTIONNAIRE - CHOICE SET 02**

Enumerator: \_\_\_\_\_

Respondent's name: \_\_\_\_\_;  
ID \_\_\_\_\_

	Conditions of the hypothetical contract (1-4)	OPTION A	OPTION B	OPTION C	NONE
	1. Minimum land area subscribed to the program (ha)	0.6 ha	0.4 ha	0.2 ha	I do not want to adopt any of these three options (Nothing will change from what you are doing now)
	2. Initial payment (VND mil/ha)	4	4	7	
	3. Technical support level	Low	Full	Medium	
	4. Monitoring and reporting	Community	Self-monitoring	Strict monitoring	
C1	Which option do you prefer? (Please mark X on your preferred option)				
C2	If you do not want to adopt any of these options, if possible, please let us know which seems to be most reasonable to you, and why				

**NOTES (FOR ENUMERATOR ONLY, PLEASE DO NOT FILL IN THIS PART)**

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**SURVEY QUESTIONNAIRE - CHOICE SET 03**

Enumerator: \_\_\_\_\_

Respondent's name: \_\_\_\_\_;  
ID \_\_\_\_\_

	Conditions of the hypothetical contract (1-4)	OPTION A	OPTION B	OPTION C	STATUS QUO
	1. Minimum land area subscribed to the program (ha)	0.2 ha	0.6 ha	0.4 ha	I do not want to adopt any of these three options (Nothing will change from what you are doing now)
	2. Initial payment (VND mil/ha)	7	4	7	
	3. Technical support level	Low	Medium	Full	
	4. Monitoring and reporting	Self-monitoring	Strict monitoring	Community	
C1	Which option do you prefer? (Please mark X on your preferred option)				
C2	If you do not want to adopt any of these options, if possible, please let us know which seems to be most reasonable to you, and why				

**NOTES (FOR ENUMERATOR ONLY, PLEASE DO NOT FILL IN THIS PART)**

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## SURVEY QUESTIONNAIRE - CHOICE SET 04

Enumerator: \_\_\_\_\_

Respondent's name: \_\_\_\_\_; ID \_\_\_\_\_

	Conditions of the hypothetical contract (1-4)	OPTION A	OPTION B	OPTION C	STATUS QUO
	1. Minimum land area subscribed to the program (ha)	0.4 ha	0.6 ha	0.2 ha	I do not want to adopt any of these three options (Nothing will change from what you are doing now)
	2. Initial payment (VND mil/ha)	10	4	7	
	3. Technical support level	Low	Full	Medium	
	4. Monitoring and reporting	Strict monitoring	Community	Self-monitoring	
C1	Which option do you prefer? (Please mark X on your preferred option)				
C2	If you do not want to adopt any of these options, if possible, please let us know which seems to be most reasonable to you, and why				

NOTES (FOR ENUMERATOR ONLY, PLEASE DO NOT FILL IN THIS PART)

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\_\_\_\_\_

## SURVEY QUESTIONNAIRE - CHOICE SET 05

Enumerator: \_\_\_\_\_

Respondent's name: \_\_\_\_\_; ID: \_\_\_\_\_

	Conditions of the hypothetical contract (1-4)	OPTION A	OPTION B	OPTION C	STATUS QUO
	1. Minimum land area subscribed to the program (ha)	0.6 ha	0.4 ha	0.2 ha	I do not want to adopt any of these three options (Nothing will change from what you are doing now)
	2. Initial payment (VND mil/ha)	7	4	4	
	3. Technical support level	Medium	Low	Full	
	4. Monitoring and reporting	Self-monitoring	Community	Strict monitoring	
	Which option do you prefer? (Please mark X on your preferred option)				
C1	If you do not want to adopt any of these options, if possible, please let us know which seems to be most reasonable to you, and why				
C2					

NOTES (FOR ENUMERATOR ONLY, PLEASE DO NOT FILL IN THIS PART)

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## SURVEY QUESTIONNAIRE - CHOICE SET 06

Enumerator: \_\_\_\_\_

Respondent's name: \_\_\_\_\_; ID \_\_\_\_\_

	Conditions of the hypothetical contract (1-4)	OPTION A	OPTION B	OPTION C	STATUS QUO
	1. Minimum land area subscribed to the program (ha)	0.2 ha	0.4 ha	0.6 ha	I do not want to adopt any of these three options (Nothing will change from what you are doing now)
	2. Initial payment (VND mil/ha)	10	4	7	
	3. Technical support level	Medium	Low	Full	
	4. Monitoring and reporting	Community	Strict monitoring	Self-monitoring	
C1	Which option do you prefer? (Please mark X on your preferred option)				
C2	If you do not want to adopt any of these options, if possible, please let us know which seems to be most reasonable to you, and why				

NOTES (FOR ENUMERATOR ONLY, PLEASE DO NOT FILL IN THIS PART)

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\_\_\_\_\_

## SURVEY QUESTIONNAIRE - CHOICE SET 07

Enumerator: \_\_\_\_\_

Respondent's name: \_\_\_\_\_; ID: \_\_\_\_\_

	Conditions of the hypothetical contract (1-4)	OPTION A	OPTION B	OPTION C	STATUS QUO
	1. Minimum land area subscribed to the program (ha)	0.2 ha	0.4 ha	0.4 ha	I do not want to adopt any of these three options (Nothing will change from what you are doing now)
	2. Initial payment (VND mil/ha)	4	7	10	
	3. Technical support level	Medium	Full	Low	
	4. Monitoring and reporting	Community	Strict monitoring	Self-monitoring	
C1	Which option do you prefer? (Please mark X on your preferred option)				
C2	If you do not want to adopt any of these options, if possible, please let us know which seems to be most reasonable to you, and why				

NOTES (FOR ENUMERATOR ONLY, PLEASE DO NOT FILL IN THIS PART)

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## SURVEY QUESTIONNAIRE - CHOICE SET 08

Enumerator: \_\_\_\_\_

Respondent's name: \_\_\_\_\_; ID \_\_\_\_\_

	Conditions of the hypothetical contract (1-4)	OPTION A	OPTION B	OPTION C	STATUS QUO
	1. Minimum land area subscribed to the program (ha)	0.2 ha	0.2 ha	0.4 ha	I do not want to adopt any of these three options (Nothing will change from what you are doing now)
	2. Initial payment (VND mil/ha)	4	10	7	
	3. Technical support level	Low	Full	Medium	
	4. Monitoring and reporting	Self-monitoring	Community	Community	
C1	Which option do you prefer? (Please mark X on your preferred option)				
C2	If you do not want to adopt any of these options, if possible, please let us know which seems to be most reasonable to you, and why				

NOTES (FOR ENUMERATOR ONLY, PLEASE DO NOT FILL IN THIS PART)

**SURVEY QUESTIONNAIRE - CHOICE SET 09**

Respondent's name: \_\_\_\_\_; ID \_\_\_\_\_  
 Enumerator: \_\_\_\_\_

	Conditions of the hypothetical contract (1-4)	OPTION A	OPTION B	OPTION C	STATUS QUO
	1. Minimum land area subscribed to the program (ha)	0.6 ha	0.4 ha	0.2 ha	I do not want to adopt any of these three options (Nothing will change from what you are doing now)
	2. Initial payment (VND mil/ha)	7	7	4	
	3. Technical support level	Low	Low	Medium	
	4. Monitoring and reporting	Strict monitoring	Community	Self-monitoring	
C1	Which option do you prefer? (Please mark X on your preferred option)				
C2	If you do not want to adopt any of these options, if possible, please let us know which seems to be most reasonable to you, and why				

**NOTES (FOR ENUMERATOR ONLY, PLEASE DO NOT FILL IN THIS PART)**

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## SURVEY QUESTIONNAIRE- EXIT QUESTIONS

Enumerator: \_\_\_\_\_ ID \_\_\_\_\_

Respondent's name: \_\_\_\_\_; Household's head: \_\_\_\_\_; Village: \_\_\_\_\_; Commune \_\_\_\_\_

	Question	Answer
C3	What are the reasons for you to adopt agroforestry under the (hypothetical) PES program? <i>(Please make sure that this is your own decision rather than influenced by any external agent)</i>	
C4	What land use type (or land use practice) that you would establish the agroforestry plot? Please mark your choice by X	Annual crop on flat land ( ) ; Home garden ( ) ; Annual crop on slope land ( ) ; Acacia plantation ( ) Fallow (grass, bush, or scattered tree) ( ) ; Other type, please specify _____ ( )
C5	Does your household <b>have full rights</b> to cultivate on that land plot? (please note that by right we mean all legal rights and customary rights and family traditions, if any) (please mark X next to the best answer in your opinion)	Yes, of course (100% sure) ( ) ; Yes, very likely (75% sure) ( ) ; Yes, but not so sure (50%) ( ) ; Likely No (25%) ( ) ; No (0% or not at all) ( )
C6	Is there any additional incentive that could further encourage your household to participate in this hypothetical PES program? <i>(Please kindly provide only one single most important incentive type according to your opinion, if any)</i>	
C7	Which of the four contractual conditions above is <u>most important</u> to your decision? (Please kindly provide order of importance, in which 1 is the most important and 4 is the least important conditions)	Minimum land area subscribed to the program ( ) ; Initial payment ( ) ; Monitoring and reporting ( ) ; Technical support level ( )

OTHER NOTES: \_\_\_\_\_

## Annex 8: Multinomial logit model estimation for the DCE data set

Multinomial logit models of preferences for a hypothetical PES program for sustainable land use practice.

Term	Estimate (Coef.)	Std Error
Minimum land area (ha)[0.2]	0.460146653	0.0367685749
Minimum land area (ha)[0.4]	0.030277236	0.0390717919
Upfront payment (VND/ha)	0.000000118	0.0000000122
Technical support[Low]	-0.235203402	0.0346066113
Technical support[Moderate]	-0.049203017	0.0362500982
Monitoring[Low]	0.666893744	0.0353152630
Monitoring[Moderate]	0.268977282	0.0384373084
AICc	3841.8496	
BIC	3881.3942	
-2*LogLikelihood	3827.7965	
-2*Firth LogLikelihood	3751.1874	
Firth Bias-Adjusted Estimate		

# Acknowledgements

*“A ship in the harbor is safe, but that’s not what ships are built for” - John A. Shedd.*

It takes courage of one to leap into the unknown. Back to 2018, just before my PhD experience began, I was nervous of moving out of my comfort zone. But I am glad that I took the challenge. After five years of up and down, I can say that embarking on the journey of a PhD is a transformative experience filled with uncertainties, and I am deeply grateful for all those who have supported me through this intricate and unpredictable path. This section is dedicated to expressing my heartfelt appreciation to those who have guided and encouraged me during times of uncertainty, making this journey challenging but rewarding.

First and foremost, I am immensely grateful to my promoters Prof. Dr Bas Arts and Prof. Dr Meine van Noordwijk, and my co-promotor Dr. Verina Ingram, for their exceptional guidance, expertise, and constant motivation. Their wealth of knowledge, dedication, and expertise have been invaluable throughout my doctoral studies. They have not only provided me with invaluable guidance and feedback but have also encouraged me to think critically, explore new avenues, and push the boundaries of knowledge. I am truly grateful for their mentorship and the trust they placed in me. I am also profoundly grateful to Dr. Delia Catacutan, my former supervisor at work, who also guided me in many ways and insisted to push me onto the PhD journey. Without her, the ship might have still stayed in the harbor. I also place on record my sincere thanks to my current supervisor, Dr. Nguyen Quang Tan for the continuous support and encouragement.

I am grateful to the faculty members, my fellow PhD colleagues and researchers in the Forest and Nature Policy Group (FNP) at Wageningen University & Research (WUR) and World Agroforestry (ICRAF) for their academic wisdom and guidance throughout my doctoral journey. Their commitment to advancing knowledge and their willingness to engage in thought-provoking discussions have greatly enriched my learning experience. The camaraderie, support, and collaboration we shared have made this journey more rewarding and enjoyable. A big thanks to Pham Thanh Van for producing the maps of study sites, and to Pham Duc Thanh at ICRAF and Poon Keen-Mun at FNP for administrative support. Special thanks to Liang Wenyuan, my fellow PhD colleague at FNP for his great support, advice, and connecting me to many friends during my stay in Wageningen. Also great thanks to Catharina, another PhD fellow at FNP, a true inspirer, a dearly loved person who is always supportive and willing to help. A huge thanks to my homestay family in Wageningen, who treated me as part of the family for almost ten weeks I lived with them and helped me integrate into Dutch life.

I am deeply indebted to the participants of my study, whose willingness to share their experiences and insights has been instrumental in the success of my research. Their contribution has helped shed light on important aspects of my study, and I am sincerely grateful for their time and cooperation. I am also indebted to the people I met during my PhD journey whom, honestly, I don't even really know (and vice versa), but they're people who have inspired me, shaped me, or just, when I recall what they did and said, make me think, "Gosh, I have never thought that way". You don't know me but thank you.

My deepest appreciation goes to my beloved friends and family for their unwavering love, encouragement, and understanding during this challenging journey. Their belief in me and their constant support have given me the strength to overcome

obstacles and persevere. I am truly blessed to have such an incredible family who has stood by me through thick and thin. Biggest thanks to my wife Thanh Hue, my son An Huy, and my daughter Linh San for being my endless positive energy source. Your love, support, and understanding have been the driving force behind my accomplishments, and I could not have reached this milestone without you. Let's get ready for our next adventure.

Lastly, I would like to thank the funding organizations or institutions that have provided financial assistance for my research. Their support has enabled me to carry out this study and pursue my academic aspirations.

In conclusion, I am truly humbled and grateful to all the individuals and organizations mentioned above for their invaluable contributions to my PhD thesis. Their collective efforts and support have been pivotal in shaping my research, enhancing my skills, and making this accomplishment a reality.

Thank you all from the bottom of my heart.

The research described in this thesis was financially supported by the World Agroforestry (ICRAF).

Financial support from Wageningen University for printing this thesis is gratefully acknowledged.

Cover design by Do Trong Hoan

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