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**SHARING FOREST RESOURCES IN THE NORTHERN UPLANDS
OF VIETNAM: AN INSTITUTIONAL ANALYSIS**

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After decades of policies favoring centralization, Vietnam has been moving toward decentralization in the forestry sector since the 1990s. This shift began with the provision of incentives for allocating and/or leasing forest and forest land to state- and non-state stakeholders for long-term management. Along with forest land allocation, the government has implemented various nationwide reforestation, afforestation, and forest protection programs. These programs are the *Greening the Barren Hills Program* (known as *Program 327*) from 1992 to 1998, the *Five Million Hectare Reforestation Program* (known as *Program 661*) from 1998 to 2010, the *Program 661*'s successor - the *Plan for Forest Protection and Development* from 2011 to 2020, and the *Payments for Forest Environmental Services Program* from 2011 to today. The goal of these programs is to provide incentives to encourage farmers to participate in forest conservation activities. To date, there is limited research using the institutional approach on incentives and on the implementation of decentralization programs. There is also a lack of research on innovative ways to improve administrative and transaction cost aspects of these programs. A greater understanding of how these programs have been implemented at local levels, how they affect local forest management efforts, and the role of stakeholders is crucial to provide insights and policy recommendations for future forest conservation policies. This dissertation aims to fill this research gap by analyzing the implementation of current national forestry policies through an institutional approach and by proposing the acknowledgment of the role of state bodies, namely, state forest enterprises (SFEs), as implementing agencies at local levels under the *Payments for Forest Environmental Services Program*. This research is based on data collected from individual in-depth interviews and focus group discussions in 2012 and 2014 in Da Bac district, Hoa Binh province in northwestern Vietnam.

The thesis contains an introduction in Chapter 1, three studies presented in Chapters 2, 3, and 4, and a conclusion in Chapter 5. The first study examines the implementation of the *Five Million Hectare Reforestation Program* and the private transaction costs incurred by farmers when participating in the program. The study reveals that the program implementation employs a top-down approach across all governance levels, in which command flows are dominant in the program's organizational structure. Local governments' contributions are not acknowledged and farmers act as forest rangers instead of forest owners since farmers do not have any rights to access timber in natural forests and have very limited rights for conflict resolution. The results indicate that the most attractive reason for farmers participating in the program is government subsidies. However, not all farmers have the same opportunity to participate in the program. Characteristics of remote areas, such as long distance to local markets, difficult access, and poor awareness among the local people, are the primary factors that prevent implementing agencies from carrying out the program. We find that management boards pay little attention to their responsibilities of contract monitoring and verification on the ground, even

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though they receive administrative fees for these activities. From a transaction cost approach, we find that a diversity of informal institutional arrangements for forest management results in a large variation in transaction costs among communities. The transaction costs per hectare per average year are relatively larger for households with individual contracts for both planting and protecting new forests than for households under community contracts for forest conservation only. This is due to the relatively small size of the forest areas that are planted and managed under individual contracts. Despite the presence of relatively high benefit-cost ratios under both types of contracts, the benefits mainly arise from the collection and sale of non-timber forest products - not from government subsidies. The net present value of forest management activities per hectare per average year is higher for households under individual contracts than for those under community-based contracts. Moreover, the net present value per hectare per average year for those planting woody trees and bamboo is higher than for those planting woody trees and acacia.

The second study examines the dual-functionality of SFEs in the implementation of the *Payments for Forest Environmental Services Program* (hereafter, *PFES Program*). Dual functions consist of environmental services providers in their own allocated forest land and intermediaries in *PFES Program* activities outside of their administrative areas. A review of the history of SFEs indicates their important role in the forestry sector in Vietnam, despite criticism about their ineffective management prior to the 1990s. Now, after privatization reforms, the main concerns about SFEs throughout the country are high interest rates and stringent lending criteria imposed by banks, making access to finance difficult. The burden of high interest rates has been passed onto contracts with farmers, making it difficult for SFEs to attract more farmers to agree to the conditions in forest management contracts. We also find that under state-led forest management programs, such as *Program 327* and *Program 661*, SFEs functioned as large forest owners and government agencies contracting, directing, monitoring, and evaluating contract fulfillments with households in their administrative areas. This study analyzes in-depth the experience of Tu Ly SFE as a case study. From an empirical analysis of Tu Ly SFE's operation and from the viewpoint of the acceptability and impacts of SFEs, we find that Tu Ly SFE's involvement with local farmers is based on three approaches: labor contracts, forest plantation contracts, and a mixture of the previous two contracts. The results reveal that there is a considerable contribution from Tu Ly SFE to farmer's employment and thus economic situation. However, not all farmers have the same chance of being contracted as Tu Ly SFE favors some households over others. An emphasis on conservation and protection, and inflexible terms under the current contracts impede Tu Ly SFE's engagement with farmers. We find that Tu Ly SFE has advantages over the other state agencies when implementing national forest management programs in regard to administrative and transaction cost perspectives. Compared to other state agencies, Tu Ly SFE has fewer parties involved, greater autonomy and outreach in the district, and an ability to propagate seedlings. This study proposes the acknowledgment of SFEs as

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environmental service providers and to use SFEs as intermediaries for monitoring activities in the *PFES Program*, keeping in mind the disadvantages and challenges of relying on SFEs to monitor the *PFES Program*.

The third study analyzes three institutional dimensions of the *PFES Program*, namely, the design, performance, and interplay. From an institutional design perspective, we find that, similar to previous forestry programs, the central government operates in a top-down fashion throughout all governance levels when implementing the *PFES Program*. Incomplete design and shortcomings at the central-level result in poorer performance at lower levels. First, forest cover is the only proxy to measure the provision of environmental services, making the *PFES Program* similar to former forest protection programs. Second, the *PFES Program's* fee collection is independent of the actual performance of forest protection on the ground, which reflects a low conditionality of the program. This may hamper the effectiveness of the program. Third, payment rates to services suppliers are set by the central government and do not reflect opportunity costs of forest management activities. Fourth, the absence of enforcement rules introduced by the central-level impedes the performance of implementing agencies on the ground. From an institutional performance perspective, we argue that it would be premature to draw comprehensive assessments on the economic, social, and environmental performance of the *PFES Program* since the program has only been implemented nation-wide for three years. Yet, we find no specific objectives or targets of the *PFES Program* at the central and provincial levels. The lack of strategic management makes it difficult to know whether the *PFES Program's* objectives have been achieved. Although there is additionality in both planted and natural forests, higher additionality in natural forests may be threatened in the near future, unless there is a more comprehensive monitoring and benefit sharing mechanism. Similar to *Program 661*, farmers participating in the *PFES Program* act as forest guards rather than forest owners. We find that the benefits to farmers that resulted from the program include economic gains, a growing awareness of environmental values, and a greater commitment to forest conservation. However, we also find that the program had some negative consequences, such as the lack of agricultural land, the discouragement of livestock development, and complaints and disputes among farmers over the benefit sharing mechanism. The results from examining the institutional interplay reveal that the *PFES Program* mainly complements other institutions at the national- and local-levels. Although incompatibilities exist in terms of customary practices, it is unlikely that these will develop into an institutional conflict.

Despite the important role of the transaction cost analysis for assessing the effectiveness of institutional arrangements within natural resource management, this type of analysis is often neglected in policy analysis. Therefore, this study's analysis of transaction costs borne by participating farmers in *Program 661* contributes to the small handful of empirical studies on private TCs associated with natural resource management activities. Moreover, proposing SFEs to function as intermediaries in

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the implementation of the *PFES Program* contributes to the limited number of studies on innovative ways to reduce transaction costs of managing this program. In addition, the dissertation contributes empirical evidence on the institutional analysis of the PFES scheme. This topic has rarely been studied and the inclusion of institutional interplay is the least researched area in the literature. As Vietnam is the first country in the region to initiate the PFES scheme nationwide, the lessons learned from the design of the PFES scheme and from its implementation in the field are valuable to other developing countries with similar conditions.

Although there is a growing awareness of environmental values among farmers, the majority of households participate in government forestry programs due to the monetary subsidy. Furthermore, the opportunity costs of forest management activities are not included in the current payment rates to households. Therefore, a higher payment should be given to participating farmers to strengthen their motivation towards sustainable forest conservation. As the results indicate that under both *Program 661* and the *PFES Program* local governments' contributions are not taken into consideration and farmers act as forest guards instead of forest owners, we recommend the empowerment of the local government and communities by giving them more autonomy with respect to forest management. In addition, given that the poor performance on the ground resulted from an incomplete design of the *PFES Program*, we recommend the inclusion of law enforcement, monitoring, and control in the design. These aspects should be put in place soon. Moreover, a particular forestry policy, such as *Program 661* or the *PFES Program*, is certainly not a one-size-fits-all solution for forest conservation. It is imperative to simultaneously include several programs across various sectors to mitigate pressure on forests. The role of related information dissemination to gradually shift farmers' behavior towards the environment should not be forgotten. Finally, proposing that SFEs function as intermediaries in the *PFES Program* is not a novel idea. However, an effective regulatory and monitoring framework is essential to avoid repeating historical problems with SFEs. To achieve wider impact, regulations regarding the acceptable terms and conditions of SFE contracts are needed to encourage local participation. Future research should evaluate national forestry policies by examining public transaction costs faced by implementing agencies. This will allow for a more comprehensive understanding of the effectiveness of forestry policies and programs and thus help the development of future policies and programs.

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Nachdem im Forstsektor Vietnams jahrzehntelang politische Maßnahmen eingesetzt wurden, welche eine Zentralisierung begünstigen, bewegt sich das Land nun seit der 1990er Jahre auf eine Dezentralisierung des Forstsektors zu. Der Wandel kam zustande, indem Anreize zur Verteilung und/oder Verpachtung von Waldgebieten und Waldbeständen an staatliche und nichtstaatliche Interessenvertreter zur langfristigen Bewirtschaftung geschaffen wurden. Neben der Verteilung von Waldflächen hat die Regierung zahlreiche flächendeckende Wiederaufforstungs-, Aufforstungs- und Waldschutzprogramme eingeführt. Beispiele für solche Programme sind das *Greening the Barren Hills Program* (auch bekannt als *Programm 327*) von 1992 bis 1998, das *Five Million Hectare Reforestation Program* (auch bekannt als *Programm 661*) von 1998 bis 2010, das Folgeprogramm für *Programm 661 – Plan for Forest Protection and Development* von 2011 bis 2020, und das *Payments for Forest Environmental Services Program* von 2011 bis heute.

Ziel dieser Programme ist es, Anreize für Bauern zu schaffen, sich an Aktivitäten zum Schutz der Wälder zu beteiligen. Es gibt bis heute nur in begrenztem Umfang Forschungsarbeiten, die sich mit dem institutionellen Ansatz zu solchen Anreizen und der Implementierung von Programmen zur Dezentralisierung befassen. Weiterhin fehlt es an Forschungsarbeiten zu innovativen Möglichkeiten, um die administrativen Kosten und Transaktionskosten dieser Programme zu senken. Ein besseres Verständnis dafür, wie die Programme auf regionaler Ebene implementiert wurden, wie sie sich auf regionale Bemühungen in der Waldbewirtschaftung und auf die Rolle der Interessenvertreter auswirken ist elementar, um Erkenntnisse zu gewinnen und politische Handlungsempfehlungen für zukünftige Waldschutzmaßnahmen zu geben. Die vorliegende Dissertation zielt darauf ab, diese Forschungslücke zu schließen, indem die Implementierung der gegenwärtigen Maßnahmen in der Forstwirtschaft auf regionaler Ebene durch einen institutionellen Ansatz analysiert werden. Es wird empfohlen, die Rolle der staatlichen Organe, nämlich der staatlichen Forstbetriebe, als implementierende Behörde auf regionaler Ebene unter dem *Payments for Forest Environmental Services Program (PFES)* anzuerkennen. Basis dieser Forschungsarbeit sind Datensätze, die aus einzelnen Tiefeninterviews und Fokusgruppen-Diskussionen aus den Jahren 2012 und 2014 im Da Ba Gebiet in der Hoa Binh Region im Nordwesten Vietnams gewonnen wurden.

Die Dissertation beinhaltet eine Einleitung im ersten Kapitel, welcher drei wissenschaftliche Studien in den Kapiteln zwei, drei und vier folgen; das fünfte Kapitel schließt mit einer Zusammenfassung. Die erste Studie analysiert die Umsetzung des *Five Million Hectare Reforestation Program*, sowie die privaten Transaktionskosten der Bauern die an dem Programm teilnehmen. Die Studie zeigt, dass die Umsetzung des Programms einen Top-down Ansatz auf allen Verwaltungsebenen verfolgt, innerhalb dessen Befehle die Organisationsstruktur des Programms beherrschen. Die Beiträge der kommunalen

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Verwaltung werden nicht anerkannt, und die Bauern agieren eher als Förster statt als Waldbesitzer, da sie keine Rechte auf Zugriff zu Holz in Naturwäldern, und nur sehr begrenzte Rechte in Bezug auf Konfliktlösung haben. Die Ergebnisse deuten darauf hin, dass die staatlichen Subventionen für die Bauern der attraktivste Grund zur Teilnahme am Programm sind. Allerdings haben nicht alle Bauern dieselben Möglichkeiten, an dem Programm teilzunehmen. Die Charakteristika von entlegenen Gebieten, wie beispielsweise die langen Anfahrtswege zu regionalen Märkten, schlechte Zugänglichkeit, sowie kaum vorhandenes Bewusstsein über vorhandene Programme unter den Ortsansässigen sind die wichtigsten Faktoren, welche die durchführenden Stellen an der Einführung der Programme hindern. Vorstände beachten ihre Verantwortung bei der Vertragsüberwachung und –überprüfung vor Ort wenig, obwohl sie Verwaltungsgebühren für ebendiese Tätigkeiten erhalten.

Mit einem transaktionskostenorientierten Ansatz ermitteln wir, dass die große Vielfalt an institutionellen Regelungen für die Forstverwaltung in einer großen Bandbreite an Transaktionskosten unter den Gemeinden resultiert. Die durchschnittlichen Transaktionskosten pro Hektar pro Jahr sind für Haushalte mit Einzelverträgen sowohl zur Pflanzung als auch zum Schutz der neuen Wälder relativ viel höher als für Haushalte die nur unter Gemeinschaftsverträgen zum Waldschutz stehen. Dies resultiert aus der relativ kleinen Anzahl an Waldgebieten die unter Einzelverträgen gepflanzt und verwaltet werden. Trotz des relativ hohen Nutzen-Kosten Verhältnisses unter beiden Vertragsarten entstehen die Gewinne hauptsächlich aus dem Verkauf anderer forstwirtschaftlicher Erzeugnisse – nicht aus staatlichen Subventionen. Der durchschnittliche Nettobarwert für Aktivitäten in der Forstverwaltung pro Hektar und Jahr ist für die Haushalte mit Einzelverträgen höher als für solche unter Gemeinschaftsverträgen. Des Weiteren ist der Nettobarwert für die Haushalte, die Bäume und Bambus anpflanzen höher als für diejenigen, die Bäume und Akazien pflanzen.

Die zweite Studie befasst sich mit der doppelten Funktionalität der staatlichen Forstbetriebe bei der Implementierung des *Payments for Forest Environmental Services Program* (im Folgenden PFES-Programm). Die Doppelfunktion besteht darin, dass die staatlichen Forstbetriebe als Umweltdienstleister innerhalb ihrer eigenen zugewiesenen Waldgebieten, und als Vermittler bei den Aktivitäten des PFES-Programms außerhalb der verwalteten Gebiete agieren. Ein Bericht über die Geschichte der staatlichen Forstbetriebe macht deren wichtige Rolle im vietnamesischen Forstsektor deutlich, obwohl es vor den 1990ern zu vermehrter Kritik bezüglich ihrer ineffektiven Verwaltung kam. Heute, nach den Reformen zur Privatisierung, betreffen die größten Bedenken landesweit die hohen Zinssätze und die von den Banken auferlegten stringenten Vergabekriterien, die den Kapitalzugang erschweren. Die Last der hohen Zinssätze wurde über Verträge an die Bauern weitergegeben, was es für die staatlichen Forstbetriebe erschwert, mehr Bauern zu gewinnen, die den Konditionen in den Forstverwaltungsverträgen zustimmen. Weiterhin haben wir festgestellt, dass die staatlichen Forstbetriebe in den vom Staat geführten Forstverwaltungsprogrammen, wie beispielsweise Programm 327 und Programm 661, als große Waldbesitzer und staatliche Behörden fungierten, die die Vergabe,

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Lenkung, Überwachung und Auswertung der Vertragserfüllung der Haushalte in ihren Verwaltungsgebieten übernehmen. Die Studie analysiert eingehend die Erfahrungen mit dem staatlichen Forstbetrieb Tu Ly als Fallbeispiel. Aus einer empirischen Untersuchung der Arbeitsweise des staatlichen Forstbetriebs Tu Ly, und im Hinblick auf Akzeptanz und Einfluss der staatlichen Forstbetriebe, können wir feststellen, dass das Engagement des Tu Ly mit den ortsansässigen Bauern auf drei Ansätzen basiert: Dem Abschluss von Arbeitsverträgen, Verträgen zu Forstplantage, und einer Kombination aus den beiden genannten Verträgen. Die Ergebnisse zeigen, dass Tu Ly einen beträchtlichen Beitrag zur Beschäftigung der Bauern, und damit zu deren wirtschaftlicher Situation leistet. Allerdings haben nicht alle Bauern dieselben Möglichkeiten um vom staatlichen Forstbetrieb Tu Ly unter Vertrag genommen zu werden, da dieser einige Haushalte anderen vorzieht. Die Betonung auf Erhaltung und Schutz sowie unflexible Konditionen bei den aktuellen Verträgen erschweren die Interaktionen mit den Bauern. Wir haben festgestellt, dass Tu Ly bei der Einführung von regionalen Forstverwaltungsprogrammen im Vergleich zu anderen staatlichen Behörden Vorteile bezüglich der Administrations- und Transaktionskosten bietet. Verglichen mit anderen staatlichen Behörden sind bei Tu Ly weniger Parteien involviert, der Betrieb ist eigenständiger und hat eine größere Reichweite innerhalb des Bezirks, sowie die Möglichkeit, Setzlinge zu züchten und verteilen. Unsere Studie schlägt vor, staatliche Forstbetriebe als Umweltdienstleister anzuerkennen, und sie als Vermittler bei Überwachungstätigkeiten im PFES-Programm einzusetzen, wobei die dabei entstehenden Nachteile und Schwierigkeiten beachtet werden müssen.

Die dritte Studie analysiert die drei institutionellen Dimensionen des PFES-Programms, und zwar die Gestaltung, die Durchführung und die Kooperation. Aus einer Perspektive der institutionellen Ausgestaltung stellen wir fest, dass die Zentralregierung bei der Einführung des PFES-Programms, ähnlich wie bei vorherigen Forstprogrammen, ein Top-Down-Ansatz durch alle Verwaltungsebenen hindurch anwendet. Unvollständige Ausgestaltung und Defizite auf zentraler Ebene führen zu einer schwächeren Leistung auf den unteren Ebenen. Zum einen ist die bewaldete Gesamtfläche die einzige Näherungsvariable um die Bereitstellung von Umweltdienstleistungen zu messen, was dazu führt, dass das PFES-Programm anderen Forstschutzprogrammen ähnelt. Zum zweiten ist die Gebühreneinnahme für das PFES-Programm unabhängig von der eigentlichen Leistungserfüllung des Waldschutzes vor Ort, was eine niedrige Konditionalität des Programms widerspiegelt. Dies könnte die Wirksamkeit des Programms behindern. Zum dritten sind die Zahlungsraten an die Dienstleistungserbringer durch die zentrale Regierung festgelegt und spiegeln daher nicht die Transaktionskosten der Forstverwaltungsaktivitäten wider. Viertens erschwert das Nichtvorhandensein von Durchführungsbestimmungen durch die zentrale Ebene die Leistungserbringung der Umsetzungsorgane vor Ort. Aus der Perspektive einer institutionellen Leistungsfähigkeit argumentieren wir, dass es voreilig wäre, umfassende Bewertungen über die wirtschaftliche, soziale und ökologische Leistung vorzunehmen, da das Programm erst vor drei Jahren

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flächendeckend eingeführt wurde. Jedoch können wir weder auf der zentralen, noch auf Länderebene, spezifische Ziele oder Zielvorgaben des PFES-Programms ausmachen.

Die mangelnde Strategie in der Verwaltung macht es schwierig, herauszufinden ob die Ziele des PFES-Programms erreicht wurden. Obwohl es einen Zusatznutzen sowohl bei angepflanzten als auch bei Naturwaldflächen gibt, könnte der höhere Zusatznutzen von Naturwäldern in der nahen Zukunft gefährdet sein, es sei denn es wird ein umfassenderer Überwachungs- und Vorteilsausgleichsmechanismus eingesetzt. Ähnlich wie bei Programm 661 agieren die Bauern, welche am PFES-Programm teilnehmen, eher als Waldaufseher statt als Waldeigentümer. Wir stellen fest, dass die Vorteile, die Bauern aus dem Programm ziehen, wirtschaftliche Erträge, ein wachsendes Umweltbewusstsein und eine höhere Einsatzbereitschaft zum Waldschutz einschließen. Es stellt sich allerdings auch heraus, dass das Programm einige negative Konsequenzen mit sich bringt, wie beispielsweise eine Knappheit an landwirtschaftlicher Nutzfläche, eine mögliche Reduktion der Viehhaltung, sowie Beschwerden und Auseinandersetzungen unter den Bauern bezüglich der Ausgleichsmechanismen. Die Ergebnisse aus der Untersuchung zur institutionellen Kooperation decken auf, dass das PFES-Programm hauptsächlich andere Institutionen auf nationaler und kommunaler Ebene ergänzt. Obwohl Unvereinbarkeiten bezüglich der üblichen Praktiken herrschen, ist es unwahrscheinlich dass diese in einem institutionellen Konflikt ausufern.

Obwohl die Transaktionskostenanalyse sehr wichtig ist um die Wirksamkeit von institutionellen Regelungen innerhalb der nachhaltigen Ressourcenbewirtschaftung zu bewerten, wird diese Art der Analyse in der Politikanalyse oft vernachlässigt. Daher trägt die vorliegende Studie mit ihrer Analyse der Transaktionskosten, welche von den am Programm 661 teilnehmenden Bauern zu tragen sind, zu den wenigen empirischen Studien über private Transaktionskosten, die in Verbindung mit einer nachhaltigen Ressourcenbewirtschaftung stehen, bei. Überdies ist der Vorschlag, staatliche Forstbetriebe als Vermittler bei der Einführung des PFES-Programms einzusetzen, ein Beitrag zu der begrenzten Anzahl an Studien über innovative Möglichkeiten zur Reduktion von Transaktionskosten, die bei der Verwaltung des Programms entstehen. Außerdem umfasst die vorliegende Dissertation empirische Zusammenhänge zur institutionellen Analyse des PFES-Schemas. Dieses Thema wurde noch kaum untersucht, und die Einbeziehung institutioneller Zusammenspiele ist in der gegenwärtigen Literatur sehr wenig erforscht. Da Vietnam als erstes Land das PFES-Schema landesweit eingeführt hat, sind die aus der Gestaltung des PFES-Schemas und der Implementierung im Feld gewonnenen Erkenntnisse wertvoll für weitere Entwicklungsländer mit ähnlichen Bedingungen.

Obwohl das Bewusstsein der Bauern für Umweltthemen zunehmend wächst, nimmt die Mehrheit der Haushalte wegen der finanziellen Zuwendungen an den staatlichen Forstprogrammen teil. Des Weiteren sind die Opportunitätskosten für Aktivitäten in der Waldbewirtschaftung bei den aktuellen

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Zahlungsraten an die Haushalte nicht berücksichtigt. Daher sollten die am Programm teilnehmenden Bauern höhere Zahlungen erhalten, um ihre Motivation hinsichtlich eines nachhaltigen Waldschutzes zu erhöhen.

Da die Ergebnisse darauf hinweisen, dass die Beiträge der Gemeindeverwaltung sowohl beim Programm 661 als auch im PFES-Programm nicht berücksichtigt werden, und die Bauern als Waldaufseher anstatt als Waldbesitzer agieren, empfehlen wir, die Gemeindeverwaltung und die Gemeinden zu stärken, indem ihnen mehr Eigenständigkeit hinsichtlich der Forstverwaltung gegeben wird. Zusätzlich empfehlen wir die Durchsetzung von Rechtsvorschriften sowie zusätzlich die Überwachung und Kontrolle der Programmgestaltung, da die schwache Leistung vor Ort aus einer lückenhaften Gestaltung des PFES-Programms resultiert. Diese Punkte sollten möglichst bald umgesetzt werden.

Überdies ist eine einzelne forstpolitische Maßnahme, wie beispielsweise Programm 661 oder das PFES-Programm, sicherlich keine Universallösung für den Waldschutz. Es ist unerlässlich, mehrere Programme gleichzeitig über verschiedene Sektoren einzusetzen, um den Druck auf die Wälder abzumildern. Es darf nicht vergessen werden, welche Rolle die Verbreitung der betreffenden Informationen spielt, um die Bauern schrittweise hin zu einer nachhaltigen Verhaltensweise zu lenken. Letztlich ist der Vorschlag, dass die staatlichen Forstbetriebe als Vermittler im PFES-Programm fungieren sollten, keine neue Idee. Ein wirksamer Regulierungs- und Überwachungsrahmen ist jedoch unerlässlich um zu vermeiden, dass sich vergangene Probleme mit den staatlichen Forstbetrieben wiederholen. Um einen größeren Wirkungsgrad zu erzielen, müssen die Regelungen zu akzeptablen Bedingungen und Konditionen der Verträge mit staatlichen Forstbetrieben die örtliche Beteiligung fördern. Zukünftige Forschungsarbeiten sollten die nationalen forstwirtschaftlichen Maßnahmen auswerten, indem die öffentlichen Transaktionskosten, mit welchen die durchführenden Organisationen konfrontiert sind, analysiert werden. Dies würde ein umfassenderes Verständnis zur Wirksamkeit von forstwirtschaftlichen Maßnahmen und Programmen ermöglichen, und folglich die Entwicklung zukünftiger Maßnahmen und Programme unterstützen.

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LIST OF ABBREVIATIONS

ADB	Asian Development Bank
CIFOR	Center for International Forestry Research
EASRD	Rural Development and Natural Resources East Asia & Pacific Region
FAO	Food and Agriculture Organization of the United Nations
5MHRP	Five Million Hectare Reforestation Program
MARD	Ministry of Agriculture and Rural Development
NPV	net present value
NTFPs	non-timber forest products
PES	payment for environmental services
PFES	payments for forest environmental services
SFEs	state forest enterprises
TC	transaction cost
USD	United States dollar
VNFF	Vietnam Forest Protection and Development Fund
VND	Vietnamese dong

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CHAPTER 1

INTRODUCTION

This chapter begins by reviewing the trend of decentralization in forest management and current policies under the context of reform in the management of the forestry sector in Vietnam. We then provide the dissertation's conceptual framework, describe the study area, present the main research objectives and questions, and outline the dissertation.

1.1 DECENTRALIZATION OF NATURAL RESOURCES MANAGEMENT

After decades of policies favoring centralization in much of the world (Agrawal and Ostrom, 2008), since the late 1980s, governments throughout South and Southeast Asia have been creating exciting and innovative opportunities for achieving sustainable forest management and biodiversity conservation goals by decentralizing¹ authority and responsibility for forest management (Enters *et al.*, 2000; Agrawal and Ostrom, 2008; Webb, 2008; Nkhata *et al.*, 2012).

Forest decentralization reforms aim to create many new centers of local decision-making authority that have direct relationships with government agencies at the central-level (Agrawal and Ostrom, 2008). The trend to decentralize is driven by a range of factors, namely: efforts to reduce central bureaucracies and cut budgets (Enters *et al.*, 2000; Agrawal and Ostrom, 2008); the failure of a history of government forest management in which centralization of authority over forest was employed (Enters *et al.*, 2000; Webb, 2008); increased economic liberalization and market orientation; growing commitment to more equitable forest management (Enters *et al.*, 2000; Agrawal and Ostrom, 2008); financial support from international donors to convert local actors into partners in natural resource management (Agrawal and Ostrom, 2008; Phelps *et al.*, 2010); and the recognition that conservation is possible across diverse tenure regimes (Agrawal *et al.*, 2008; Agrawal and Ostrom, 2008 cited in Phelps *et al.*, 2010). Throughout the region, innovative legislation and policies are strengthening the hands of the local government and communities in the management of forest resources (Enters *et al.*, 2000). Various decentralization initiatives have led to greater access and control of forest resources by local people. In turn, forest protection and management have often improved and pressure on resources have been reduced (Enters *et al.*, 2000).

¹ According to Enters *et al.* (2000), decentralization can be defined as the relocation of administrative functions away from a central location, while devolution can be defined as the relocation of power away from a central location. Despite diverse definitions of decentralization and devolution, these two terms are often treated as equivalent. In practice, it is possible to decentralize administrative functions without devolving the power to make meaningful decisions.

1.2 REFORM OF FORESTRY SECTOR MANAGEMENT IN VIETNAM

Vietnam is a tropical country located in the Indochina peninsula of Southeast Asia (Tan, 2006). Nearly three-fourths of the country's land surface is mountainous and the arable area per capita is about 0.1 ha, the lowest rate in the world (The *et al.*, 2004). The upland regions² represent 75% of the country's total area and are endowed with 95% of total forested area, 70% of total fauna and flora species, and over 90% of different categories of plants and mineral resources (Vo Quy, 2002 cited in The *et al.*, 2004). Compared to other upland regions, the Northern Uplands is the poorest region with the highest incidence of poverty in Vietnam (The *et al.*, 2004). As of 2013, the population of the Northern Uplands is 11.5 million people, representing about 12.9% of the national population (General Statistics Office of Vietnam, 2015). Despite many programs and policies that the Government has implemented, compared to other regions in Vietnam, the upland regions still endure the highest incidences of hunger and poverty (Chu Huu Quy, 2002 cited in The *et al.*, 2004; Nguyen *et al.*, 2014). Hunger and poverty are some of the main reasons for the degradation of natural resources in Vietnam's mountainous regions. There is a scarcity of level land available for paddy rice, forcing farmers to clear their fields on steeply sloped hillsides (The *et al.*, 2004). In 1943, Vietnam had 14.3 million hectares (ha) of natural forests, which represented 43% of the country's total land area. Since then, forest cover has decreased dramatically and is equivalent to a decrease of 98,000 ha annually. This decrease was particularly high from 1976 to 1990 (de Jong *et al.*, 2006). There are several factors that are considered to be causes of forest cover decline, namely: (1) land conversion for farm land; (2) devastation from war; (3) forest fires; (4) over-exploitation by state organizations and illegal logging by individuals; and (5) poor management capacity of the forestry sector and a deficient institutional and legal framework (de Jong *et al.*, 2006). Under these conditions, Vietnam has grown increasingly concerned about the consequences of forest conversion. The Government of Vietnam is attempting to reverse the declining trend of forest cover (de Jong *et al.*, 2006). However, a major challenge is that the aim to decrease forest conversion cannot be separated from that to reduce poverty.

Decentralization in Vietnam began in December of 1987, when the nation launched market-oriented reforms, known as *Doi Moi* in Vietnamese (Webb, 2008). Although the initial impacts of the *Doi Moi* were in the agricultural sector, it had major implications for the forestry sector (Webb, 2008). In addition, the decline of forest resources and the inefficiency of state forest enterprises (SFEs) for forest management resulted in the recognition of the role of local communities in natural resource management (Sikor, 1998; de Jong *et al.*, 2006; Tan, 2006; Dung and Webb, 2008; Webb, 2008; Nguyen *et al.*, 2014; Phuc and Nghi, 2014). Remarkable changes in the forestry sector towards the inclusion of various forest and forest land tenure arrangements have been made.

² The upland regions include 19 provinces (10 highland and 9 midland mountainous provinces) that are located in the Northern Mountain, Midland, and Central Highland regions.

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1.2.1 Forest land³ allocation

The vital devolution policy is the forest land allocation policy (FLA). The aim of the FLA is to encourage farm households and local communities to be involved in the protection and restoration of forest cover in the uplands after the long period of over exploitation of forests. The rationale of this devolution was that villagers would be more interested in forest protection and management if they had formal rights to forest land (Sikor, 2001 cited in Sunderlin and Ba, 2005). The FLA policy, which began in 1994, is based on two laws, the *Forest Protection and Development Law 1991* and *Land Law 1993*. The former outlines the rules for managing the three types of forest (i.e., special-use, protection, and production forests) and provides a legal framework for allocating forest resources to a diversity of stakeholders for management, protection, and commercialization (Phuc and Nghi, 2014). The latter allows land users to have long-term, renewable land-use titles, known as Red Books (Tan *et al.*, 2008; Nguyen *et al.*, 2010; Phuc and Nghi, 2014). This incentive allows farmers to be legal forest land owners⁴ of the allocated and/or leased parcels of forest land for 50 years and to have the rights to exchange, transfer, inherit, mortgage, and lease the forest land (Tan, 2006; Tan *et al.*, 2007; Dung and Webb, 2008; Tan *et al.*, 2008; Nguyen, 2012).

Furthermore, the *Land Law 2003* and *Forest Protection and Development Law 2004* added a provision for communities to be allocated land (including forest land) and natural forest (Sunderlin and Ba, 2005; Dung and Webb, 2008; Catacutan *et al.*, 2011), but did not indicate that a community has ownership rights of the forest it is allocated (Tan *et al.*, 2008). Moreover, the *Vietnam Forest Development Strategy* from 2006 to 2020 emphasizes forest land allocation to households and individuals, sustainability of forest protection, and the development of and building a market for ecological services to mobilize non-state funds for forest protection (Phuc and Nghi, 2014).

Since 1994, national and local governments have been allocating and releasing forest and forest land to state groups (including SFEs, management boards for protection and special-use forests, Commune People's Committees, and the armed forces) and non-state groups (including households, local communities, and joint-stock companies) (Tan *et al.*, 2007; Dung and Webb, 2008; Webb, 2008). As of the beginning of 2012, Vietnam had approximately 15.4 million ha of forest land that is categorized into three types of forest land, namely production forest land, protection forest land, and special-use forest land. Approximately 79% (12.2 million ha) of Vietnam's forest land has been allocated to the

³ According to the *Forest Protection and Development Law 1991*, forest land includes land of forest cover and land of no forest cover that is planned for afforestation.

⁴ Although land officially belongs to the state but it is given to individuals and/or households for long-term use in Vietnam. According to Feder *et al.* (1998, as cited in Nguyen, 2012, p.4): "In many societies, some or all land is constitutionally the property of the state, but exclusive rights are given to individuals under a contractual arrangement with the state. If these use rights are transferable with few limitations, and if the contract is sufficiently long term, then for most of the contract's duration there is very little difference between possession of use rights and full property rights. This is exactly the case for farmland in Vietnam".

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above-mentioned state and non-state groups. The remaining 21% (3.2 million ha) has not yet been allocated and is currently managed by local communities and Commune People's Committees (Phuc and Nghi, 2014). Despite these achievements, it is argued that the FLA has several shortcomings. First, the FLA is inequitable as almost all protection and special-use forest land was devoted to state bodies. This left households and individuals with production forest land, which is mainly barren. In addition, there was an over-allocation of forest land to SFEs, mass organizations, and well-off individuals (e.g., Sunderlin and Ba, 2005; Phuc and Nghi, 2014). Second, the FLA was very slow, has had mixed results (Sunderlin and Ba, 2005; Government of Vietnam, 2007), and was not even implemented in some areas (Le, 2006 cited in Tan *et al.*, 2007).

1.2.2 Afforestation and reforestation programs

Along with the forest land allocation program, uplands afforestation and reforestation began in the early 1990s. Farm households and local communities were awarded cash payments for the protection of forests on their allocated and/or leased land (mainly, natural forests), were given seedlings and labor payments for planting and maintaining new trees, and were given trees when the older trees had been harvested (Sikor, 2001 cited in Sunderlin and Ba, 2005; Dung and Webb, 2008). Government *Decree No.327* in 1992 established a national program *Greening the Barren Hills* (known as *Program 327*) that aimed to protect and re-establish forests from 1992 to 1998. Moreover, the policy also intended to eliminate rotational agriculture systems, which were viewed as leading to forest destruction and low productivity (Webb, 2008). In 1998, the *Five Million Hectare Reforestation Program* (known as *Program 661*) from 1998 to 2010 was formulated under *Decision No. 661* of the Prime Minister. This program established 5 million ha of new forests and protected 9.3 million ha of existing forest to increase Vietnam's national forest cover from 28% in 1998 to 43% by 2010 (Government of Vietnam, 1998). These programs helped Vietnam achieved some notable results in the forestry sector, especially in terms of increasing forest cover and forest product exports, and also helped reduce poverty levels in mountainous areas (Coi, 2012). As of the end of 2014, Vietnam claimed to have 13.8 million ha of forests, or 40.43% of forest cover, which is composed of 10.1 million ha of natural forests and 3.7 million ha of planted forests (MARD, 2015).

Program 661 was argued to be wider in scope than *Program 327*, as the former involved reforestation, tree plantations, and watershed protection, emphasizing reforestation rather than afforestation (Sunderlin and Ba, 2005). Both of these programs received a lot of criticism for shortcomings in their design and implementation. It is argued that these programs: were too top-down; had too much government control and restrictions on forest use; had low returns to participants and a high degree of dependence on the Government; had inadequate funding; were corrupt and had bad practices; ambiguous and complex in their provisions; and were inequitable (Sunderlin and Ba, 2005; de Jong *et al.*, 2006).

1.2.3 A new approach for forest conservation: Payments for forest environmental services

In recent years, a new funding mechanism, payments for ecosystem/environmental services (PES), has been developed. PES financially link people who protect and/or restore forests with stakeholders who receive direct economic benefits from forested areas (e.g., Wunder, 2005). In Vietnam, PES have been officially integrated into the national *Biodiversity Law 2008* (McElwee, 2012). At the same time, Vietnam piloted a new policy of forest conservation in the form of the *Payments for Forest Environmental Services Program* (hereafter, *PFES Program*). While previous reforestation and afforestation programs (e.g., *Program 327* and *Program 661*) were largely financed by the government, the *PFES Program* consider protection, forest development, preservation of forest ecology, biodiversity, and natural landscapes as services. This means that those using environmental services must pay service providers. After more than two years of piloting the *PFES Program* in Son La and Lam Dong provinces, Vietnam achieved a number of positive results. The first lessons from this pilot stage experience have been used since 2011 to support and scale-up the implementation of the *PFES Program* nationwide (ADB, 2014; Phuc and Nghi, 2014), making Vietnam the first country in Southeast Asia to initiate a nationwide PFES scheme (McElwee, 2012; Thuy *et al.*, 2013). The incentives to forest land owners for maintaining forest environmental services is calculated based on a set of k-coefficients, namely: forest quality (rich, average, or poor); forest type (production forest, protection forest, or special-use forest); origin of forest (natural or planted forest); and the level of difficulty or ease of forest management (easy, medium, or hard).

Although the PFES scheme is seen as a promising approach in forest conservation, there are several challenges. Among other concerns, high transaction costs and organizational problems are a challenge to the implementation of the *PFES Program* (The *et al.*, 2004; Thuy *et al.*, 2013). For example, Thuy *et al.* (2013) examined the implementation of the *PFES Program* by conducting a large-scale research project in nine provinces, representing different socio-ecological regions in Vietnam. Apart from many other conclusions, the authors write: “The complexity of the administrative arrangements is a major impediment to the efficient implementation of PFES in Vietnam. PFES employs a top-down approach that disenfranchises the poor; it is difficult for local authorities and other local organizations to involve the poor in the design of PFES when buyers of environmental services and those designing PFES mechanisms are working to predetermined selection criteria and suppliers of environmental services have limited access to information” (Thuy *et al.*, 2013, p.45). In addition, Thuy *et al.* (2013) indicate that high transaction costs reduce the efficiency of the PFES scheme, stating that “transaction costs tend to be high because of the large number of forest owners, the complexity of administrative structures, the limited capacity of public servants, conflicts of interest, and weak coordination and information sharing between and within government agencies” (Thuy *et al.*, 2013, p.45). Although it is not easy to find out resolutions to these shortcomings, it is necessarily to ensure the efficiency of the expanding PFES scheme in Vietnam.

1.2.4 The role of state forest enterprises in forestry policies/programs

State forest enterprises have played a pivotal role in the development of Vietnam's forestry and wood-growing sector (de Jong *et al.*, 2006). However, they and other state-owned enterprises were greatly affected by radical transformations in the economy since the *Doi Moi* (Artemiev, 2003). Before *Doi Moi*, SFEs acted as state-run logging companies (Clement and Amezaga, 2009; Phuc and Nghi, 2014). Since 1994, SFEs' economic activities have been seriously influenced by a logging ban in natural forest (Sunderlin and Ba, 2005; Clement and Amezaga, 2009) and by a cut-off of previous government subsidies (de Jong *et al.*, 2006; Phuc *et al.*, 2012). In 1999, a reform was initiated to transform SFEs into commercially-viable and autonomous business units. In 2004, privatization picked-up again due to the slow pace of the reform process: non-viable SFEs should either be dissolved or transformed into a Protection Forest State Management Board (Clement and Amezaga, 2009; Phuc *et al.*, 2012). Phuc and Nghi (2014) report that by 2011, 256 SFEs had been shifted into 148 Forestry One-Member Limited Liability Companies⁵ (FCs), 3 joint-stock companies, and 91 forest management boards. In addition, 14 ineffective SFEs were completely dissolved. Merely 10 of the 148 FCs are under the control of the central government, while the 138 remaining SFEs are managed by their respective Provincial People's Committees.

Despite their planned restructuring, SFEs presently control a fairly large area of forest land (de Jong *et al.*, 2006; Clement and Amezaga, 2009) and are the largest recipient for forestry land-use rights in Vietnam (Tan, 2006). As of 2011, 148 forestry companies manage 1.9 million ha of forest land (12.3 % of Vietnam's total forest land)⁶, which is mainly production forest land. According to *Report No.595* by the Vietnam Forest Administration, the average land area (including forest land) received by a SFE was about 14,000 ha (Phuc and Nghi, 2014). Moreover, despite criticism on SFEs' ineffective management in the past, SFEs have been playing dual-functions under state-led programs (e.g., *Program 327*, *Program 661* and currently the *Plan for Forest Protection and Development 2011-2020*). SFEs establish tree plantations on their own allocated forest land. They have created jobs for households living nearby through contracting with these households for land preparation and tree planting. In addition, SFEs act as intermediaries (i.e., state implementing agencies) by issuing contracts to individual households for forest protection, regeneration, and plantation on farmer's forest land, and by transferring incentives (e.g., tree saplings and payments for labor costs for plantation and maintenance of the trees) to households for afforestation and protection (Clement *et al.*,

⁵ A forestry company is always composed of several SFEs, in which each SFE functions as a branch of the company in its respective administrative forest land area. In practice, the term "state forest enterprises" is therefore applied when one wants to refer to branches of forestry companies. For example, Hoa Binh Forestry Company includes seven SFEs and one factory. These seven SFEs are located in seven separate districts. In business, people say, "Tu Ly state forest enterprise Branch of the Hoa Binh Forestry Company" to refer to Tu Ly state forest enterprise in Da Bac district, Hoa Binh province. In this study, we use the term "state forest enterprises" to refer to companies' branches located in corresponding districts.

⁶ The percentage is calculated based on the national forest land area in 2012.

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2009; Phuc and Nghi, 2014). Currently, SFEs situated in areas with hydropower plants are allowed to generate income from the PFES scheme (Government of Vietnam, 2010; Phuc and Nghi, 2014).

General speaking, while the trend of decentralization is very promising, there is a need for a greater understanding of how these policies are actually implemented at the local-level and how they affect local forest management efforts (Enters *et al.*, 2000). In addition, understanding and measuring private transaction costs incurred by households when participating in these programs provide insight and policy implications for forest conservation. Moreover, Agrawal and Ostrom (2008) argue that any analysis of decentralization policies requires an examination of the incentives and roles of a number of actors, rather than those of states or central governments alone.

1.3 CONCEPTUAL FRAMEWORK OF THE DISSERTATION

In this subsection, we first explain linkages among key stakeholders involved in the implementation of policies and programs in the forestry sector ([Figure 1.1](#)). Then, we list the objectives and research questions of the dissertation before briefly introducing the study sites.

[Figure 1.1](#) describes connections among key stakeholders involved in the implementation of policies and programs in Vietnam's forestry sector. Under *Program 661* and the *PFES Program*, upland households (i.e., forest owners⁷) are provided incentives for reforestation, afforestation, and protection of forests. The outcome is environmental services that benefit the public (i.e., services users). In turn, government subsidies (under *Program 661*) and payments from users of services (under the *PFES Program*) are transferred to households. This transfer is facilitated by state intermediaries. The contract is an institutional arrangement between intermediaries and households. In [Figure 1.1](#), these linkages are shown by arrows No. 2 and 4, respectively. On the other hand, under the PFES scheme, SFEs are large providers of environmental services. Apart from SFEs' role as services providers, we examine whether SFEs can act as state intermediaries in implementing PFES and whether their involvement in PFES can reduce transaction costs. These linkages are shown by arrow No. 3 in [Figure 1.1](#).

⁷ Forest owners mean organizations, households or individuals that are assigned or leased forests or land for afforestation and have their forest use rights as well as the ownership right over planted production forests recognized by the State; or that are transferred forests from other forest owners (Section 4, Article 3 of *Vietnam Forest Protection and Development Law 2004*). In addition, forest owners have the rights to mortgage, provide guarantee or contribute capital with, land use rights according to the provisions of land legislation (Section 1, Article 72 of *Vietnam Forest Protection and Development Law 2004*).

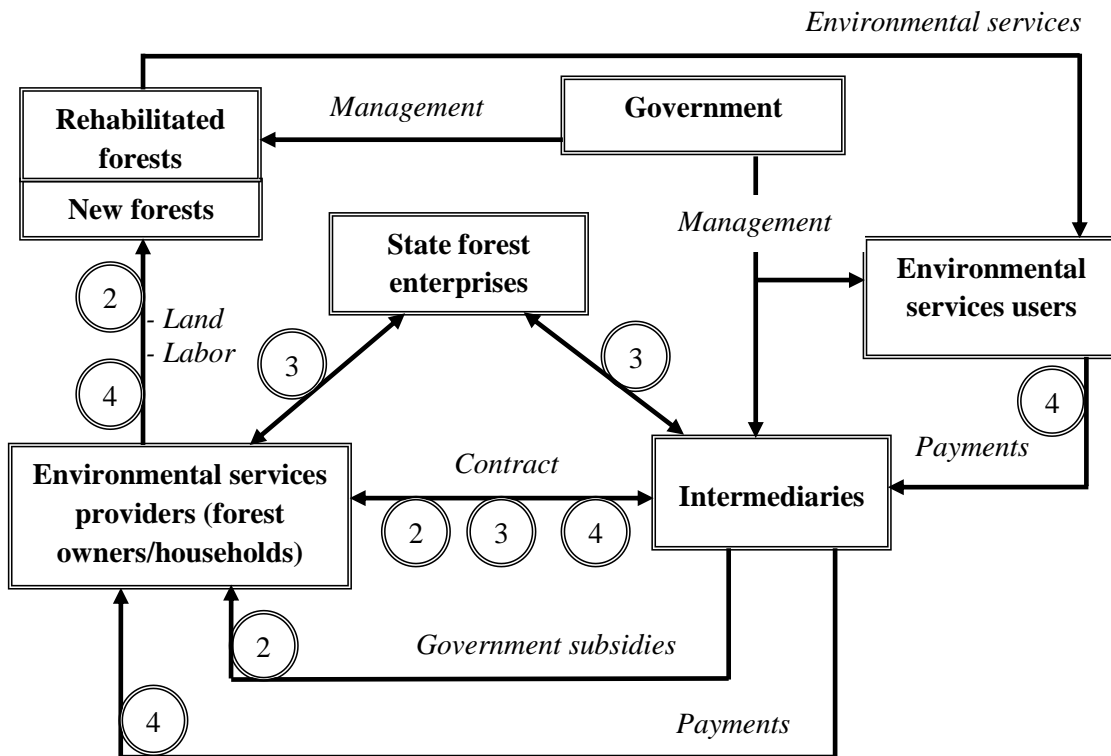


Figure 1.1: Conceptual framework of the dissertation

This dissertation employs an institutional approach to analyze the implementation of Vietnam’s current national forestry policies under the context of decentralization and the transactional perspective to examine transaction costs incurred by participating farmers in the programs and policies. Furthermore, this dissertation examines the dual-functionality of SFEs in the implementation of PFES policy. In this regard, this dissertation contributes to the literature on empirical lessons learned from the implementation of forest conservation policies in the developing world, as well as to current research on transaction costs. In addition, policy implications for forest management and reservation are provided. This dissertation has the following three main objectives and research questions:

Objective 1: To analyze the implementation of the *Five Million Hectare Reforestation Program* and its transaction costs.

- Question 1: How has the program been implemented? Who is involved in and is responsible for various activities during the implementation process?
- Question 2: What are the underlying reasons for farmers to participate in the program?
- Question 3: What transaction costs are incurred by and what are the benefits accruing to participating farmers during the program?

Objective 2: To analyze the role of state forest enterprises (SFEs) in *Payments for Forest Environmental Services*.

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- Question 1: What was the contribution of SFEs to the forestry sector in the past? How have SFEs been restructured?
- Question 2: What are the organizational strengths and weaknesses of SFEs?
- Question 3: How could SFEs' involvement in PFES potentially reduce transaction costs and organizational problems?

Objective 3: To analyze the institutional dimensions of the *Payments for Forest Environmental Services Program*.

- Question 1: What is the motivation behind implementing PFES? What is the legal framework for PFES?
- Question 2: How has the *PFES Program* been implemented in terms of monitoring and evaluation of contracts? What are the consequences of the program's implementation?
- Question 3: Are existing informal institutions and policies and/or policy instruments at different levels of governance and across various sectors complementary and/or adversarial to the design and implementation of PFES?

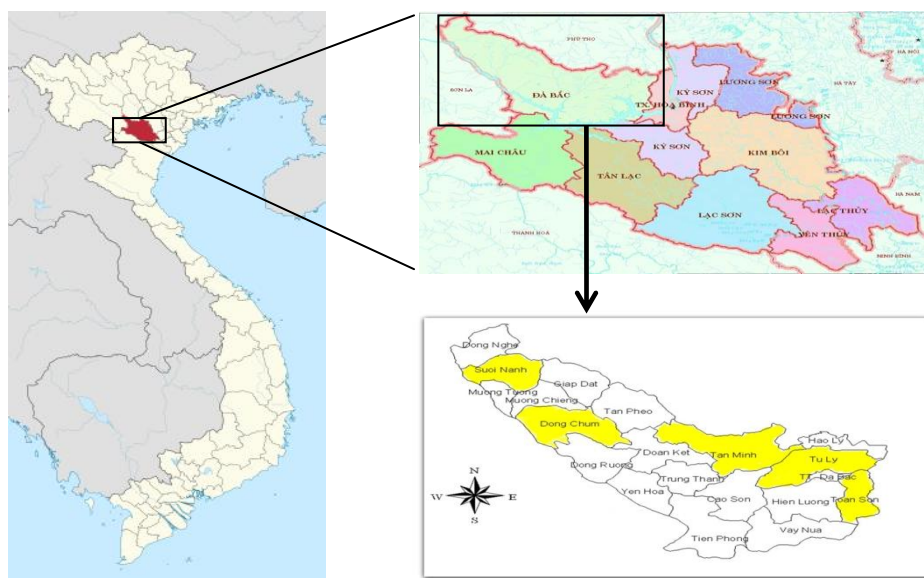
The analysis of transaction costs is considered an effective tool within development policy analysis for evaluating the effectiveness of institutional arrangements within the natural resources management sphere (Mburu *et al.*, 2003; Adhikari and Lovett, 2006; Kuperan *et al.*, 2008; Blore *et al.*, 2013), as well as for determining divisions of power and access (Meshack *et al.*, 2006). Furthermore, a transactional perspective can be of value when assessing the effectiveness of a functioning program scheme (Falconer, 2000). Despite the important role that transaction cost methodologies can play, this aspect of resource use management is often neglected in policy analysis (Falconer, 2000; Rørstad *et al.*, 2007; Pearson *et al.*, 2013). Relatively few empirical studies on private transaction costs associated with natural resources management activities have been carried out (Leffler and Rucker, 1991; Falconer, 2000; Falconer and Saunders, 2002; Adhikari and Lovett, 2006; Kuperan *et al.*, 2008; Foundjem Tita *et al.*, 2011; Widmark *et al.*, 2013) and only a few comparative estimates of the costs and benefits involved have been undertaken (Mburu *et al.*, 2003; Blore *et al.*, 2013). The first objective of this dissertation, dealt with in [Chapter 2](#) (which is referred to by arrow No. 2 in [Figure 1.1](#)), seeks to address this research gap by using a transaction cost perspective to examine private transaction costs borne by farmers when carrying out forest management activities and by applying a qualitative approach to explore underlying reasons for farmers' participation in the *Five Million Hectare Reforestation Program*.

Moreover, given that limited research is available on innovative ways to reduce transaction costs of managing the *PFES Program*, we explore alternative management options for reducing transaction costs by examining the dual functionality of SFEs as environmental services providers in their own

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forest lands and as intermediaries in PFES' program activities outside their areas of administration. This objective is addressed in [Chapter 3](#).

Finally, despite the number of studies on the definition of PES and the steady increase over the past decade in the quantification and valuation of environmental services (e.g., Corbera *et al.*, 2007; Muradian *et al.*, 2010; Vatn, 2010), in-depth research on the institutional processes that mediate the provision of environmental services through compensation mechanisms has only recently started to emerge (Corbera *et al.*, 2009). The third objective seeks to gain an understanding of questions related to the institutional design, performance, and interplay of the PFES scheme. In this regard, this study adds to the limited empirical evidence on the institutional analysis of PFES scheme and on empirical lessons from PFES' implementation in the field. This objective is addressed in [Chapter 4](#).



Map of Vietnam (Source: Wikipedia)

Map of Hoa Binh province and Da Bac district (Source: Da Bac district People's Committee)

Figure 1.2: Map of study sites

The data collection for this dissertation was conducted through individual in-depth interviews and focus group discussions during August-September of 2012 and March-April of 2014 in Da Bac district, Hoa Binh province in northwestern of Vietnam. In addition, secondary data were gathered from the literature. Da Bac is an upland district having the largest forest land area (83.6% of the district's total land area) compared to other districts in the province. The district is about 20km northwest of Hoa Binh city and about 92 km northwest from the national capital, Ha Noi. The district is also located within the catchment of Hoa Binh hydropower dam.

1.4 OUTLINE OF THE DISSERTATION

This dissertation is divided into five chapters. [Chapter 2](#) uses a transaction cost perspective to examine private transaction costs borne by farmers when carrying out forest management activities, applies a qualitative approach to explore underlying reasons for their participation in the *Five Million Hectare Reforestation Program*, and analyzes difficulties faced by stakeholders when implementing the program. [Chapter 3](#) reviews the policy and legal frameworks of SFEs, examines the organizational strengths and weaknesses of SFEs, and proposes that SFEs are intermediaries involved in the implementation of the *PFES Program*. [Chapter 4](#) analyzes the motivation behind the implementation of PFES; examines the performance, sustainability, and management of the program; sheds light on complementary and adversarial interplay among PFES and other formal and informal institutions at different levels of governance, as well as across sectors. Lastly, [Chapter 5](#) provides a discussion of the results, conclusions, policy implications, and suggestions for future research.

1.5 REFERENCES

- ADB, 2014. Scaling up payments for forest environmental services in Vietnam: Lessons and insights from Quang Nam. Mandaluyong, Philippines.
- Adhikari, B., Lovett, J.C., 2006. Transaction costs and community-based natural resource management in Nepal. *Journal of Environmental Management* 78 (1), 5-15.
- Agrawal, A., Ostrom, E., 2008. Decentralization and community-based forestry: Learning from experience. In: *Decentralization, forests and rural communities: Policy outcomes in South and Southeast Asia*. Webb E. L. and Shivakoti G. (Eds). SAGE Publications India. New Delhi, pp. 44-67.
- Artemiev, I., 2003. State forestry enterprise reform in Vietnam: Unlocking the potential for commercial wood growing. Technical Note May 2003. World Bank. Washington D.C., USA.
- Blore, M.L., Cundill, G., Mkhulisi, M., 2013. Towards measuring the transaction costs of co-management in Mkambati Nature Reserve, Eastern Cape, South Africa. *Journal of Environmental Management* 129 (15 November 2013), 444-455.
- Catacutan, D.C., Ha, H.M., Sen, H., Luan, T.D., 2011. Moving beyond pilots: A review of lessons learnt in payments for forest ecosystem services (PFES) in Vietnam. World Agroforestry Center.
- Clement, F., Amezaga, J.M., 2009. Afforestation and forestry land allocation in Northern Vietnam: Analysing the gap between policy intentions and outcomes. *Land Use Policy* 26 (2), 458-470.
- Clement, F., Orange, D., Williams, M., Mulley, C., Epprecht, M., 2009. Drivers of afforestation in Northern Vietnam: Assessing local variations using geographically weighted regression. *Applied Geography* 29 (4), 561-576.

INTRODUCTION

- Coi, L.K., 2012. Forest governance monitoring in Vietnam. Workshop on forest governance assessment and monitoring, Ha Noi, Vietnam.
- Corbera, E., Kosoy, N., Tuna, M.M., 2007. Equity implications of marketing ecosystem services in protected areas and rural communities: Case studies from Meso-America. *Global Environmental Change* 17 (3), 365-380.
- Corbera, E., Soberanis, C.G., Brown, K., 2009. Institutional dimensions of payments for ecosystem services: An analysis of Mexico's carbon forestry programme. *Ecological Economics* 68 (3), 743-761.
- de Jong, W., Sam, D.D., Hung, T.V., 2006. Forest rehabilitation in Vietnam: Histories, realities and future. Center for International Forestry Research. Bogor, Indonesia.
- Dung, N.T., Webb, E.L., 2008. Incentives of the forest land allocation process: Implications for forest management in Nam Dong district, Central Vietnam. In: Decentralization, forests and rural communities: Policy outcomes in South and Southeast Asia. Webb E. L. and Shivakoti G. (Eds). SAGE Publications India. New Delhi, pp. 269-291.
- Enters, T., Durst, P.B., Victor, M., (eds), 2000. Decentralization and devolution of forest management in Asia and the Pacific. The Center for People and Forests (RECOFTC), report No.18 and RAP Publication 2000/1. Bangkok, Thailand.
- Falconer, K., 2000. Farm-level constraints on agri-environmental scheme participation: A transactional perspective. *Journal of Rural Studies* 16 (3), 379-394.
- Falconer, K., Saunders, C., 2002. Transaction costs for SSSIs and policy design. *Land Use Policy* 19 (2), 157-166.
- Foundjem Tita, D., D'Haese, M., Degrande, A., Tchoundjeu, Z., Van Damme, P., 2011. Farmers' satisfaction with group market arrangements as a measure of group market performance: A transaction cost analysis of non timber forest products' producer groups in Cameroon. *Forest Policy and Economics* 13 (7), 545-553.
- General Statistics Office of Vietnam, 2015. Area, population and population density in 2013 by province [Online]. Available at: <https://www.gso.gov.vn/default.aspx?tabid=714> [Accessed: November 13, 2015].
- Government of Vietnam, 1998. Decision No. 661/QD-TTg dated July 29, 1998 of the Prime Minister on objectives, tasks, policies and implementation arrangements for the Five Million Hectare Reforestation Program. Ha Noi, Vietnam.
- Government of Vietnam, 2007. Decision No. 18/2007/QD-TTg dated February 5, 2007 of the Prime Minister on Vietnam forestry development strategy 2006-2020. Ha Noi, Vietnam.
- Government of Vietnam, 2010. Decree No. 99/2010/ND-CP dated September 24, 2010 of the Government on policy for payments for forest environmental services. Ha Noi, Vietnam.
- Kuperan, K., Raja Abdullah, N.M., Pomeroy, R.S., Genio, E.L., Salamanca, A.M., 2008. Measuring transaction costs of fisheries co-management. *Coastal Management* 36 (3), 225-240.

INTRODUCTION

- Leffler, K.B., Rucker, R.R., 1991. Transactions costs and the efficient organization of production: A study of timber-harvesting contracts. *Journal of Political Economy* 99 (5), 1060-1087.
- MARD, 2015. Decision No. 3135//QD-BNN-TCLN dated August 6, 2015 of the Minister on the declaration of national forests status in 2014. Ha Noi, Vietnam.
- Mburu, J., Birner, R., Zeller, M., 2003. Relative importance and determinants of landowners' transaction costs in collaborative wildlife management in Kenya: An empirical analysis. *Ecological Economics* 45 (1), 59-73.
- McElwee, P.D., 2012. Payments for environmental services as neoliberal market-based forest conservation in Vietnam: Panacea or problem? *Geoforum* 43 (3), 412-426.
- Meshack, C.K., Ahdikari, B., Doggart, N., Lovett, J.C., 2006. Transaction costs of community-based forest management: Empirical evidence from Tanzania. *African Journal of Ecology* 44 (4), 468-477.
- Muradian, R., Corbera, E., Pascual, U., Kosoy, N., May, P.H., 2010. Reconciling theory and practice: An alternative conceptual framework for understanding payments for environmental services. *Ecological Economics* 69 (6), 1202-1208.
- Nguyen, T.T., 2012. Land reform and farm production in the Northern Uplands of Vietnam. *Asian Economic Journal* 26 (1), 43-61.
- Nguyen, T.T., Bauer, S., Uibrig, H., 2010. Land privatization and afforestation incentive of rural farms in the Northern Uplands of Vietnam. *Forest Policy and Economics* 12 (7), 518-526.
- Nguyen, T.T., Koellner, T., Le, Q.B., Lambini, C.K., Choi, I., Shin, H.-j., 2014. An economic analysis of reforestation with a native tree species: The case of Vietnamese farmers. *Biodiversity and Conservation* 23 (4), 811-830.
- Nkhata, B.A., Mosimane, A., Downsborough, L., Breen, C., Roux, D.J., 2012. A typology of benefit sharing arrangements for the governance of social-ecological systems in developing countries. *Ecology and Society* 17 (1), 17.
- Pearson, T.R.H., Brown, S., Sohngen, B., Henman, J., Ohrel, S., 2013. Transaction costs for carbon sequestration projects in the tropical forest sector. *Mitigation and Adaptation Strategies for Global Change* 19 (8), 1209-1222. This article is published with open access at Springerlink.com. DOI 1210.1007/s11027-01309469-01309468.
- Phelps, J., Webb, E.L., Agrawal, A., 2010. Does REDD+ threaten to recentralize forest governance. *Science* 328 (5976), 312-313.
- Phuc, T.X., Dressler, W.H., Mahanty, S., Thuy, P.T., Zingerli, C., 2012. The prospects for payment for ecosystem services (PES) in Vietnam: A look at three payment schemes. *Human Ecology* 40 (2), 237-249.
- Phuc, T.X., Nghi, T.H., 2014. Forest land allocation in the context of forestry sector restructuring: Opportunities for forestry development and uplands livelihood improvement. *Tropenbos International Vietnam*. Hue, Vietnam.

INTRODUCTION

- Rørstad, P.K., Vatn, A., Kvakkestad, V., 2007. Why do transaction costs of agricultural policies vary? *Agricultural Economics* 36 (1), 1-11.
- Sikor, T., 1998. Forest policy reform: From state to household forestry. In: *Stewards of Vietnam's upland forests*. Asia Forest Network, Berkeley, pp. 18-38.
- Sunderlin, W.D., Ba, H.T., 2005. Poverty alleviation and forests in Vietnam. Center for International Forestry Research. Jakarta, Indonesia.
- Tan, N.Q., 2006. Trends in forest ownership, forest resources tenure and institutional arrangements: Are they contributing to better forest management and poverty reduction? Case study from Vietnam. In: *Understanding forest tenure in South and Southeast Asia - Forestry Policy and Institutions Working Paper No 14*. Food and Agriculture Organization of the United Nations (FAO), Rome, Italy, pp. 355-407.
- Tan, N.Q., Ngai, N.B., Thanh, T.N., 2007. Forest tenure reform in Viet Nam: Experiences from Northern Upland and Central Highlands regions. International conference on poverty reduction and forests, Bangkok, Thailand.
- Tan, N.Q., Ngai, N.B., Thanh, T.N., Sunderlin, W., Yasmi, Y., 2008. Forest tenure reform in Vietnam: Case studies from the Northern Upland and Central Highlands regions. The Center for People and Forests (RECOFTC), Bangkok, Thailand and The Rights and Resources Initiative (RRI), Washington D.C, USA. Unpublished Draft Report.
- The, B.D., Ha, D.T., Chinh, N.Q., 2004. Rewarding upland farmers for environmental services: Experience, constraints and potential in Vietnam. World Agroforestry Centre (ICRAF), Bogor, Indonesia.
- Thuy, P.T., Bennett, K., Phuong, V.T., Brunner, J., Dung, L.N., Tien, N.D., 2013. Payments for forest environmental services in Vietnam: From policy to practice. Occasional Paper 93. Center for International Forestry Research. Bogor, Indonesia.
- Vatn, A., 2010. An institutional analysis of payments for environmental services. *Ecological Economics* 69 (6), 1245-1252.
- Webb, E.L., 2008. Forest policy as a change context in Asia. In: *Decentralization, forests and rural communities: Policy outcomes in South and Southeast Asia*. Webb E. L. and Shivakoti G. (Eds). SAGE Publications India. New Delhi, pp. 21-43.
- Widmark, C., Bostedt, G., Andersson, M., Sandström, C., 2013. Measuring transaction costs incurred by landowners in multiple land-use situations. *Land Use Policy* 30 (1), 677-684.
- Wunder, S., 2005. Payments for environmental services: Some nuts and bolts. Occasional Paper No. 42. Center for International Forestry Research. Bogor. Indonesia.

CHAPTER 2

THE FIVE MILLION HECTARE REFORESTATION PROGRAM IN VIETNAM: AN ANALYSIS OF ITS IMPLEMENTATION AND TRANSACTION COSTS. A CASE STUDY IN HOA BINH PROVINCE

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Abstract

This research study uses a qualitative approach to examine the implementation of the *Five Million Hectare Reforestation Program* in Vietnam, and to explore the underlying reasons for local people's participation in the program. The study also uses a transactional model to examine the private transaction costs borne by farmers when carrying out forest management activities under the program. The study reveals that: (i) the implementation of the program was generally characterized by a top-down process, (ii) the principal contribution to household benefits derived from forest management activities was the collection and sale of non-timber forest products, not the subsidy provided by the government, (iii) the main challenges faced during implementation of the program were the low and fixed subsidies provided, the improper types of trees being planted, poor access to the forest, and a lack of awareness among local people towards the benefits to be derived from participation in the forest management program, and that (iv) under the program's community contracts, attending meetings (52%) and self-monitoring activities (35%) constituted the largest proportion of total time spent on forest management, while under the individual contracts, self-monitoring activities (98%) were the main component. Participating in the planting *and* protection of forests under the program brought greater benefits to households than when involved in forest protection activities alone. The main implications of this study are that an increase of payments under both types of contract, and especially the community contract, as well as the provision of higher quality seedlings and fertilizers, need to be taken into consideration in future initiatives. In addition, local communities and authorities should be further empowered, and their contribution should be taken into consideration in future programs.

2.1 INTRODUCTION

Recent forest management activities in Vietnam have gone through a transition, from a centrally planned to a more participatory social forestry approach (Sam and Trung, 2001; Tan *et al.*, 2007) in which forest owners are given land use rights under the 'Red Book' (Tan *et al.*, 2007). Genuine uplands reforestation and afforestation started in the early 1990s, with the support of the *United Nation's Food Program* (PAM), and through a national program entitled '*Greening the Barren Hills*' (known as *Program 327*), as well as other regional reforestation programs. These programs have since helped Vietnam achieve some notable results in the forestry sector, especially in terms of increasing forest cover and forest product exports, and reducing poverty levels in mountainous areas (Coi, 2012).

As a continuation of previous reforestation efforts, in 1998 the government of Vietnam launched the *Five Million Hectare Reforestation Program* (hereafter, the *5MHRP*). The overall objective of this program was to establish five million hectares of new forest and protect 9.3 million hectares of existing forest, in order to increase national forest cover from 28% to 43% by 2010. To achieve this target, the program pursued the task of rehabilitating two million hectares of special-use and protection forest, and of planting one million hectares of new forest within watershed areas. Three million hectares was also set aside as production forest; two million hectares to produce the raw materials needed for manufacturing paper, timber and non-timber forest products (NTFPs), and the remaining one million hectares set aside for fruit trees and other perennial crops. As part of the program, 50 million seedlings were planted around houses, offices, schools, and along roads and canals each year, to help meet the demand for firewood and domestic furniture in local villages. The *5MHRP* went into implementation in 1999 (Government of Vietnam, 1998).

The government wanted farmers to be part of the sustainable development initiative, so the majority of upland farm households were given financial incentives to undertake reforestation activities. Contractual arrangements were concluded between the government and the farmers, with the farmers being the sellers and the government the buyer of environmental goods and services. However, there were significant transaction costs associated with participation in the program, these being incurred both by public parties such as government bodies and implementing agencies, and also the participants (Falconer, 2000; Mettepenningen *et al.*, 2009). Transaction cost analysis is considered an effective tool within development policy analysis for evaluating the effectiveness of institutional arrangements within the natural resources management sphere (Mburu *et al.*, 2003; Adhikari and Lovett, 2006; Kuperan *et al.*, 2008; Blore *et al.*, 2013) and also for determining divisions of power and access (Meshack *et al.*, 2006). Furthermore, a transactional perspective can be of value when seeking to assess the effectiveness of a functioning program scheme (Falconer, 2000). The omission of transaction costs from policy considerations and decision-making processes can result in sub-optimal policies being designed and implemented (Falconer and Saunders, 2002). Despite the

important role transaction cost methodologies can play, this aspect of resource use management is often neglected in policy analysis (Falconer, 2000; Rørstad *et al.*, 2007; Pearson *et al.*, 2013). Relatively few empirical studies on private transaction costs associated with natural resources management activities have been carried out (Leffler and Rucker, 1991; Falconer, 2000; Falconer and Saunders, 2002; Adhikari and Lovett, 2006; Kuperan *et al.*, 2008; Foundjem Tita *et al.*, 2011; Widmark *et al.*, 2013), and few comparative estimates of the costs and benefits involved have been done (Mburu *et al.*, 2003; Blore *et al.*, 2013). As local knowledge and co-management can reduce information asymmetries and exploit advantages in terms of reducing the costs of managing information (Ostrom, 1990; Ostrom *et al.*, 1999) and the sharing of development practices (Singleton, 2000), the research literature tended to emphasize the importance of collaborative processes within natural resource management activities. However, relatively little research on the transaction costs incurred by small holders as a part of such collaborative resource management schemes has been undertaken.

This paper seeks to address this research gap, using a transactional perspective to examine the private transaction costs borne by farmers when carrying out forest management activities, and explore the underlying reasons for their participation in the 5MHRP. The study further analyzes the difficulties faced by stakeholders when implementing the program.

In [Section 2.2](#), we provide the research framework of transaction costs; [Section 2.3](#) describe the case study area, sample size, and methodology of the data collection and analysis; [Section 2.4](#) analyzes the implementation of the program and the private transaction costs of carrying out forest management activities; [Section 2.5](#) contains the discussion of results; and [Section 2.6](#) provides conclusions⁸.

2.2 THE RESEARCH FRAMEWORK

2.2.1 Transaction costs: Definition and measurement

Transaction cost analysis within the natural resource management field is a growth area (Widmark *et al.*, 2013). The key challenge faced by empirical studies when estimating transaction costs is the lack of a clear-cut definition of such costs (Wärneryd, 1994; Falconer, 2000; Meshack *et al.*, 2006; Royer, 2011; Blore *et al.*, 2013). A number of useful definitions are available in the literature. According to Gordon (1994), transaction costs are the expenses incurred when organizing and participating in a market or implementing a government policy (McCann *et al.*, 2005). In the context of natural resources management, transaction costs can be understood as the costs incurred by management processes such as gathering information, negotiating, monitoring and coordinating activities related to the management and use of resources, and the costs of enforcing property rights (Hanna, 1995; McCann *et al.*, 2005; Van Huylenbroeck *et al.*, 2005; Adhikari and Lovett, 2006; Ray and

⁸ This paragraph was not included in the published version in the journal.

THE IMPLEMENTATION OF THE 5MHRP AND ITS TRANSACTION COSTS

Bhattacharya, 2011; Blore *et al.*, 2013). In the area of community-based resource management in particular, Meshack *et al.*, (2006) define transaction costs as the costs incurred by individual households when attending meetings and implementing property rights agreements related to local resources. Hanna (1995) gives a broader definition of the term by also including monetary expenditures on information management, travel and communications. In their study of 2006, Adhikari and Lovett point out that there is a helpful way to distinguish appropriation costs and production costs from transaction costs. Accordingly, resource appropriation costs refer to the time spent collecting, processing, and transporting forest products from the forest to the house, while production costs are costs incurred on infrastructure activities such as building and repairing fences, fire breaks, forest trails and footpaths, as well as the costs arising from the damage to crops and livestock caused by wild animals (Adhikari and Lovett, 2006).

The measurement of transaction costs can be difficult for the following reasons. First, as stated earlier, there is no common understanding of what transaction costs actually are (Falconer, 2000; Meshack *et al.*, 2006; Blore *et al.*, 2013; Widmark *et al.*, 2013); moreover, it may be difficult to separate production costs from transaction costs (Musole, 2009; Royer, 2011). Second, transaction costs are often complicated to observe or quantify (Van Huylenbroeck *et al.*, 2005). Third, if transaction costs turn out to be very high, some transactions might not even take place. In this case, the “opportunity costs of alternatives have to be taken into account and these opportunity costs are not easily identifiable” (Royer, 2011). Fourth, differences in individual characteristics means that not all agents face the same transaction costs (Royer, 2011), plus not all studies apply the same criteria when estimating such costs. As a result, estimated transaction costs are not always directly comparable across studies (Rørstad *et al.*, 2007). However, a clear grouping of transaction costs can help to compare empirical studies (McCann *et al.*, 2005). Fifth, whether the relevant transaction costs are sufficiently included in a study depends on a researcher’s knowledge of the relevant political and natural system (McCann *et al.*, 2005; Kuperan *et al.*, 2008; Marshall, 2013), and of the realities in terms of how policies are developed and implemented (McCann *et al.*, 2005). This, in turn, influences the design of the data collection activities that take place (Marshall, 2013) and also the policy recommendations that result (McCann *et al.*, 2005).

The literature suggests that transaction costs can be categorized as *ex ante* and *ex post* – reflecting in turn those that occur before and after the actual transaction has taken place (Mburu *et al.*, 2003; McCann *et al.*, 2005). Such costs may be represented as dynamic and static (Abdullah *et al.*, 1998), and as fixed and variable (Hanna, 1995; Mburu *et al.*, 2003; Adhikari and Lovett, 2006; Musole, 2009; Ray and Bhattacharya, 2011). Hanna (1995) indicates that there are four different resource management stages during which variable transaction costs are incurred: the description of the resource context, regulatory design, implementation and enforcement. At the community level, transaction costs can arise from the coordination of activities among community members, and from

the interactions between local communities and state agencies on activities such as lobbying and bargaining, among others (Mburu *et al.*, 2003; Arifin, 2006). The extent of transaction costs at the community level is therefore influenced by the physical characteristics of a resource and the social capital held by community members (Adhikari and Lovett, 2006; Ray and Bhattacharya, 2011), thus the benefits generated by collective action might be exceeded by management costs (Hanna, 1995).

As already stated, defining transaction costs is not straightforward (McCann *et al.*, 2005), but in the context of this study, we define transaction costs as the costs incurred when implementing the project's forest management contracts, and covering activities such as searching for information, monitoring and coordinating tasks related to the management and use of resources, and enforcing property rights. As some activities only occur during the start-up phase, while others were incurred on an annual basis, we separated the transaction costs into costs at the initial stage (i.e., start-up costs) and recurrent annual transaction costs (Adhikari and Lovett, 2006). The former are based on start-up activities, and include learning about the program, attending the necessary training, establishing groups and obtaining contracts. The latter include the recurring, annual activities that occurred, such as regular meetings on forest management, performance updates and contract renewals, self-monitoring and enforcement activities – such as guarding the forests from encroachers and settling disputes, and joining-in with the official monitoring and verification activities. The transaction costs incurred reflect the hours spent on each of these activities (Falconer and Saunders, 2002; McCann *et al.*, 2005), with the costs added up over the course of the project to produce the final transaction costs.

2.2.2 Setting-up the 5MHRP in the context of existing forest types and forest land policies in Vietnam

The *Law on Forest Protection and Development 2004* (Vietnam National Assembly, 2004) defines three categories of forest, namely special-use forest (e.g., national parks, natural conservation areas and historical areas), protection forest (e.g., watershed and shoreline forest), and production forest (e.g., timber and non-timber forest product forest) (Sam and Trung, 2001). In practice, each type of forest may include either natural forest or planted forest, or a mixture of the two. The *Forest land Allocation Policy* was implemented in 1994/1995 at our research sites, and under this policy, land used for both protection and production forest, with or without trees, was allocated to individuals and organizations. However, land within special-use forest areas was only allocated to government bodies.

The *5MHRP* offered four types of contract; the first three covering protection forests, the fourth production forests ([Table 2.1](#)).

Table 2.1: Contract types under the 5MHRP

Contract type	Name of contract	Duration (years)	Contract target
	<i>Protection forests</i>		
Type 1	Planting <i>and</i> protection of new forests	9	Individual households
Type 2	Zoning for protection of existing, natural forests	5	Village communities
Type 3	Zoning for regeneration and protection of existing, natural forests	6	Individual households
	<i>Production forests</i>		
Type 4	Planting of forests	1	Individual households

Source: Own data, interviews 2012

Contracts developed for protection forests differed from those used for production forests in terms of the benefits-sharing mechanisms used, and the duration and level of monetary subsidy provided. Among the protection forest contracts, type 3 contracts were not used in the study area. Contract type 1 was divided into two time-stages, of which the first four years was set aside for planting, tending and nurturing new forests, and the next five years covered the protection of those forests. This contract mainly covered barren forest land allocated to individual households. Planting a certain proportion of woody trees per hectare for protection purposes was compulsory under contract type 1. The two common planting options available to the villagers under this contract were woody trees and acacia, or woody trees and bamboo. Type 2 contracts were used for the protection of natural forest plots, and were as well originally allocated to individual households. However, due to conflicts arising, as discussed later in this paper, households decided to manage this type of forest communally, regardless of who the real forest land owners or Red Book holders were, setting up their own community-based forest management mechanisms.

We focus in this study on contract type 1 (hereafter referred to as an ‘individual contract’) and type 2 (hereafter referred to as a ‘community contract’).

2.3 EMPIRICAL STUDY

2.3.1 Study site and sample size

Da Bac, an upland district of Hoa Binh province, was selected as the site for the fieldwork project ([Figure 1.2](#)). The district is about 20km northwest of Hoa Binh city and about 92 km from the national capital Ha Noi, and is located within the catchment of Hoa Binh hydropower dam. In total, the district’s forest land accounts for 83.6% of its total land area (Da Bac District Department of Agriculture and Rural Development, 2011). As a result, it is important to know the costs and benefits accruing to farmers as a result of participating in the forestry program, as it is a mountainous district in which the local people depend heavily on the forests. Five communes were chosen from the 20 in the district, and these communes were chosen for two reasons. First, they represented three socio-ecological regions which differed from the normal terrain and agro-forestry practices to be found in

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the district. Region 1, in the east of the district and close to the main town in Da Bac district, is focused on traditional agriculture production, animal husbandry, the production of handicrafts, and services. Meanwhile, regions 2 and 3 specialize in planting and protection of forests, and planting and management of fruit and industrial trees. Region 2 also has potential for aquaculture, as it is located near Hoa Binh reservoir. Region 3, which is characterized by steep hills and mountains, is rather suitable for diversified and large-scale agro-forestry production (Da Bac District Department of Agriculture and Rural Development, 2011). Second, they were under two different forest management boards: the District Management Board of Protection Forest (hereafter, MB1) and the Management Board of Da River Protection Forest (hereafter, MB2).

One village was then randomly selected from each commune, each reflecting well the institutional and socio-ecological diversity to be found in Da Bac district, including all the institutional forms used within the *5MHRP*. Two out of the five villages chosen are located in region 1, another two villages in region 2, and the last village is located in region 3. With regard to the presence of different management boards, two of the villages are under the management of MB1, while the other three villages are managed by MB2. For the purpose of this study, we named the villages Co1 and Co2 (under the management of MB1), and Da1, Da2 and Da3 (under the management of MB2) to protect the identities of the data sources (Meshack et al., 2006). Among the farmers with individual contracts, five households that joined the program at different times were selected from each village for in-depth interviews. The only exception was village Da3, as individual contracts were not used there.

The fieldwork was conducted during August and September 2012, and in total, 39 individual in-depth interviews and 15 focus group discussions with 6-8 participants per each were held. Key informants were the managers, departments' heads, and those officials directly involved in the project implementation across various governance levels. Accordingly, two interviews were conducted on provincial level and seven on district level; five interviews and five focus group discussions were held on commune level, five interviews with village headmen and ten focus group discussions were conducted on village level, and finally twenty interviews were carried out with households. Two main research hypotheses were explored in this research. First, under the program's policy framework, variations in transaction costs when carrying out forest management activities resulted in different net benefits generated among the two contract types and across study areas. Second, the high level of transaction costs and other difficulties during implementation acted as constraints on farmers participating in the program. Main research questions to the key informants were: How was the program implemented? Who was involved in/responsible for which type of activities during the implementation process? What were the underlying reasons for farmers to participate in the program? What were the transaction costs incurred by and benefits accruing to the participating farmers during the project?

2.3.2 Data collection and analysis

We mainly adopted a qualitative approach in this study. Participatory Rural Appraisal (PRA) and Net-Map were used for gathering data. PRA is composed of numerous approaches and methods that enable local people to share, enhance and analyze their knowledge of life and conditions, to plan and to act (Chambers, 1994). PRA is applied in natural resources management, agriculture, and poverty and social programs (Chambers, 1994). Net-map is an interview-based mapping tool that helps people understand, visualize, discuss, and improve situations in which many different actors influence outcomes (Schiffer, 2007).

In this study, PRA tools as mapping, community historical profile, and Venn diagram were carried out in each village during the initial stages, to learn about the communities' histories and the rural livelihoods there, as well as to identify any problems that emerged during the forest resource management program while Net-Maps were used to find out the involved stakeholders and their roles in the implementation of the project, as well as the formal and informal links between them. Both focus group discussions and individual in-depth interviews were employed, using semi-structured questionnaires. Respondents from government departments at different levels were also interviewed, to find out more about the implementation process, the stakeholders involved and the stakeholders' roles in implementing the program. Respondents at the village level were interviewed individually and in groups, to obtain information on their forest management activities, such as timber extraction and NTFPs collection, and their opinions on the management board officials in the villages. The interviews also asked about the difficulties faced during the program's implementation.

Transaction costs and benefits information was collected from different points in time for the different implementation stages. Furthermore, as the duration of the contracts was more than one year, the costs and benefits generated were extrapolated up to the end of the implementation stage (Falconer and Saunders, 2002). Ideally, the information would have been collected while the program was still running (McCann et al., 2005); thus, we faced difficulties, since we had to ask the respondents to recall unrecorded information from the past. To reduce the risks of this approach, we spent more time with each respondent than would normally have been the case, as suggested by Meshack (2006).

The interviews carried out during the data collection phase were transcribed word-for-word. Each transcription was coded using predefined nodes, that is, nodes determined by the researcher before the fieldwork took place, and also new nodes for information that emerged during coding. These nodes were then grouped together under broad categories. The coding process was carried out with the help of NVIVO10. We also took notes during the survey, and these were integrated with the respondents' direct quotes during the final analysis stage.

2.4 RESULTS

2.4.1 Command structure, monetary flows, and the administration costs within the 5MHRP

Command structure

A schematic diagram showing the stakeholders involved in the 5MHRP is shown in [Figure 2.1](#). Each Provincial People’s Committee was responsible for the program within its jurisdiction, and a Provincial Executive Committee was assigned to formulate long- and medium-term plans, plus monitor the progress and results of the program. Provincial Project Management Boards, after consulting with the Executive Committee, issued program implementation guidelines and monitored the performance of the District Management Boards. Below this, technical departments at the provincial level; for example, the departments of Agriculture and Rural Development, Natural Resources and Environment, and Planning and Investment, provided assistance with certain tasks as and when needed. The Nature Conservation Area Management Board (hereafter referred to as MB3) and the District Management Board of Protection Forest (MB1) contracted directly with the households and communities over forest management activities, made payments to them and monitored their performance. Another separate Management Board (MB2) was responsible for implementing the same activities as MB1 and MB3, but only in communes belonging to the Da River Reservoir. The Commune People’s Committee and village headman there coordinated with other agencies to facilitate implementation on the ground.

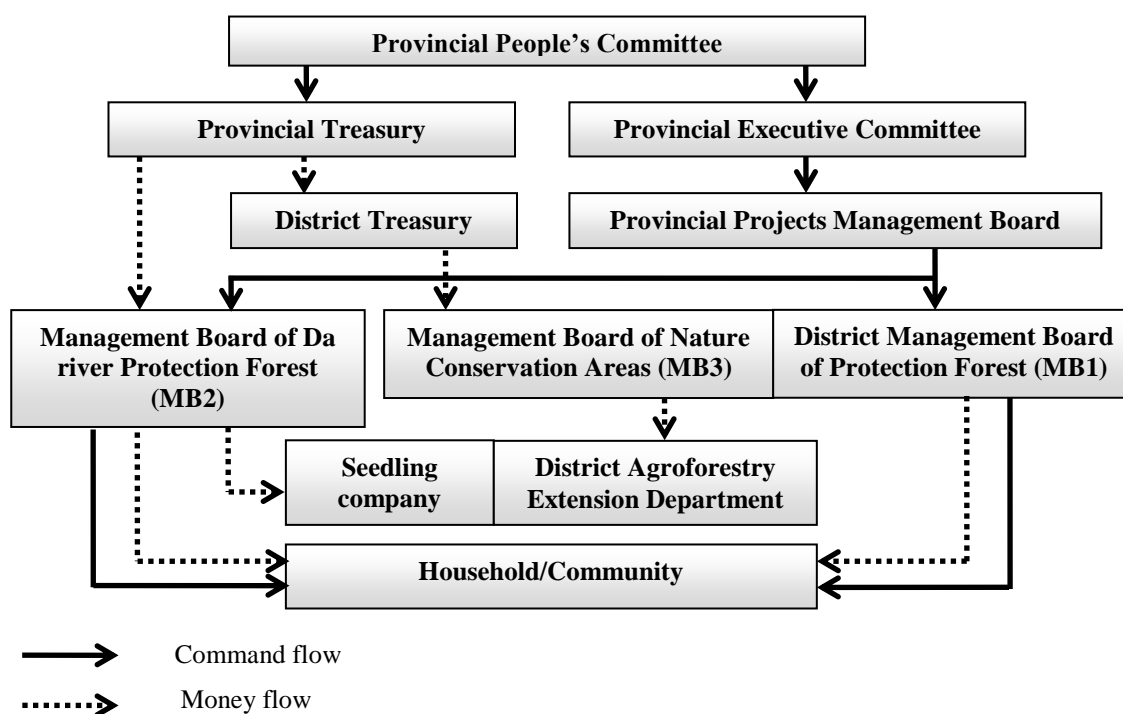


Figure 2.1: The 5MHRP: Command structure and monetary flows

Monetary flows and administration costs

Since MB2 implemented the program across all communes in the Da River Reservoir catchment area, which covers many different districts, it received its money directly from the provincial treasury, while MB1 and MB3 received their money from the district treasury. All three types of management boards were responsible for transferring government subsidies to households and communities, to support their forest management activities, plus paid for the use of technical experts and for seedling supplies (Figure 2.1).

The administration costs at different governance levels accounted for 10% of the total national budget invested in the project. The 0.7% was kept at the central-level, while the provincial level and project management boards at district level were allowed to keep at 1.3% and 8%, respectively (Ministry of Agriculture and Rural Development; Ministry of Planning and Investment; and Ministry of Finance, 2009). Commune governments were given no fee for their administration, although they were assigned to coordinate with relevant agencies to facilitate the implementation on the ground.

2.4.2 Village profiles and characteristics of the household respondents

In the five communities studied, the average forest area per community contract was 146.2 hectares. Four of the five communities had finished their 5-year contracts, while the last one was still in its fourth year. The number of households in the villages ranged from 58 to 84, with Da2 being the biggest village with 380 people, and Co2 the smallest with 242 people. On average, there were 73 households and 313.4 people per village. Three of the five communities were mono-ethnic, with the Dao group living in Da1, the Tay in Da2 and the Muong in Da3. Villages Co1 and Co2 were ethnically more diverse; here Tay people accounted for 95% and 80% of the population, respectively. The rest of the population in these villages was made-up of minority ethnic groups such as the Kinh, Muong and Dao. According to the national poverty line of 2011 (Government of Vietnam, 2011), the highest percentage of poor households, at 72.3%, was found in Da1, while the lowest was 31% in village Da2. Village Co1 had the longest stretch of road accessible by trucks all year-round, at 5 km in length, while Da1 had none at all. Of the five communities studied, village Da2 was the furthest from the district center (73km), followed by villages Da3 (72km), Co1 (33km), Da1 (9km) and Co2 (5km).

Under the project, the average forest area per individual contract was 1.6 hectares. Out of the 20 households interviewed, 45% of the respondents said they planted woody trees and acacia, while 55% reported that they planted woody trees and bamboo. These households were at different stages of implementation when the interviews took place, with 47% in the first 4-year stage, 29% in the second 5-year stage (i.e., the protection of newly planted forest), and 24% having already finished the contract. On average, it took farmers 24 minutes by foot to reach the nearest forest plots, and 50 minutes to reach the furthest.

2.4.3 Forest management transaction costs

2.4.3.1 Transaction cost-days in the communities

[Table 2.2](#) provides a breakdown of the average time spent on the various forest management activities in the five communities. Participants in the focus group discussions confirmed that the operational activities had been more or less similar over the years of the project, except for the first, start-up year. The respondents were therefore asked to recall the time they invested during the start-up and latter stages of the program. The total transaction cost-days were separated into two groups, based on whether costs at the initial stage or recurrent annual transaction costs were involved, the former representing start-up activities and the latter calculated by multiplying time spent on recurrent annual activities by the length of the contract. The total transaction costs per average year were the highest for village Co1 (263 days), followed by Da1 (138 days), Da2 (53 days), Da3 (45 days) and Co2 (15 days). Since the forest areas belonging to the villages varied in size, table 2 also shows the labor days used per hectare. Those villages with the larger forest areas tended to have lower labor intensity rates per hectare per average year, as can be seen for villages Da1 and Da3. Co1 is the only exception, as it invested the highest amount of time in forest management activities compared to other villages.

Table 2.2: Transaction costs: Number of days' labor spent on forest management activities among the five study communities

Village	Natural forest area (ha)	Total TCs per average year (labor-days)	Total TCs per hectare per average year (labor-days)	% of total TCs per hectare per average year				
				Start-up cost-days	Recurrent annual TCs-days			
				Regular meetings	Self-monito-ring	Conflict resolution	Joining monitoring and verification	
Co1	179	263	1.5	2.9	23.4	68.4	4.0	1.3
Co2	11	15	1.4	23.1	64.5	7.4	0.0	5.0
Da1	330	138	0.4	3.8	24.9	70.8	0.0	0.5
Da2	31	53	1.7	10.3	68.1	19.0	2.4	0.2
Da3	180	45	0.3	7.0	78.4	11.6	1.9	1.1

Source: Own data, focus group discussions 2012

Since the villages agreed the natural forest be managed by the whole community, household members had to send one representative to participate in all common activities. The amount of time spent on start-up activities therefore include the number of days an entire community spent attending the introduction program, formulating general village regulations and sanctions with regard to forest-related violations, forming the Forest Guard Groups or Village Forest Management Board, or both, and determining the operational regulations required. All the communities were similar in terms of the number of activities they participated in and their attendance at the two-hour discussions held during the start-up period, but varied in terms of the total number of days spent on project activities, due to differences in household numbers in each village. Among the five communities studied, start-up

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activities accounted for a large proportion of the total transaction costs for villages Co2 and Da2 - at 23.1% and 10.3% respectively. This indicates that the amount of time spent on collective activities during the start-up phase did not depend much on the size of the forest areas being managed. As a result, these start-up activities tended to represent a bigger proportion of the total time spent in those communities with smaller forested areas.

Recurrent annual transaction costs were incurred due to the regular village meetings held, and the self-monitoring, conflict resolution and management board activities that took place. Regular meetings required the attendance of at least one representative per household, to assess progress on and plan forest management activities. These activities included providing updates on the activities of the Forest Guard Groups and the Village Forest Management Boards, managing changes in membership, contract renewals, and the distribution of government subsidies. The time spent at these regular meetings depended on the frequency and length of the meetings, as well as the number of households in each community. In general, most of the communities spent a relatively large proportion of time attending these regular meetings.

Forest monitoring was periodically conducted by Forest Guard Groups, with the exception of village Da3, which neither had a Forest Guard Group nor a Village Forest Management Board. Therefore, a commune level Committee for Fire Prevention, which included the village headmen, took over that responsibility. This means that only the village headman spent time on self-monitoring activities in Da3, and as a result, a large proportion of time (78%) was instead spent on regular meetings in this community, but only a small amount of time (12%) was spent on monitoring activities. In comparison, villages Co1 and Da1 spent more time monitoring when compared to Co2 and Da2. In fact, monitoring accounted for about 68% and only 7% of time spent on project activities in Co1 and Co2, respectively, within an average year, monitoring being conducted every ten days in village Co1; each monitoring activity taking the Forest Guard Group half a day. On the other hand, in village Co2, monitoring was only carried out once a year, whereas the constituted observations were made from the local main road.

Conflict resolution refers to the amount of time the community spent dealing with violations, such as illegal logging, the opening of new fields, and NTFPs collection activities. The time spent on conflict resolution was relatively small in general, and such activities were not even required in villages Co2 and Da1. In four of the study areas, limited enforcement powers were given to the local communities, meaning they could resolve small violations themselves. Otherwise, violations had to be reported to the higher authorities at the commune or district levels. For example, village Co1 could impose sanctions for the illegal logging of less than one cubic meter of timber, with a fine of 100,000 VND (US\$4.9 in 2011) for the first offense, and 200,000 VND (US\$9.8 in 2011) for the second. Any subsequent violations, however, had to be reported to the commune. With regard to the illegal

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opening of new fields, village Co1 was given the power to impose a fine of 300 VND/m² if the violation involved less than 1,000 m². Village Da3 was the only study area with no enforcement rights for its villages, as all violations had to be reported to the commune.

Participating in management board activities meant that village representatives were required to participate in monitoring and verification processes on the ground, and these activities took up 5% of the time spent on forest management activities in village Co2, but much less in the other villages.

2.4.3.2 Transaction cost-days: A comparison between individual and community contracts

[Table 2.3](#) shows the difference in labor days spent on forest management activities among the individual contract and community contract areas. Villages with a 5-year community contract spent much more time on forest management activities per average year (103 labor days) than those with 9-year individual contracts (16 labor days), because the communities spent more time on coordination activities and collective action. However, the total time spent per hectare per average year was much higher for individual contracts, at about 13 labor days. It is likely that the individual contracts entail a higher level of commitment in terms of forest management activities when compared to the common ownership model.

Table 2.3: Transaction cost-days spent on forest management activities for individual and community contracts

Type of contract	Average area per contract (ha)	Total TCs per average year (labor days)	Total TCs per hectare per average year (labor days)	% of total TCs per hectare per average year				
				Start-up Cost-days	Regular meetings	Self-monitoring	Conflict resolution	Monitoring and verification
Individual	1.6	16	12.7	1.0	2.3	93.2	0.1	3.4
Community	146.2	103	1.0	9.4	51.9	35.4	1.7	1.6

Source: Own data, household in-depth interviews and focus group discussions 2012

The proportion of each component within the total time spent varied considerably across the different contract types. For example, start-up activities accounted for 9.4% of time spent under the community contracts, as they involved not only attending the introduction program, as with an individual contract, but also taking part in other collective actions, such as the formulation of general village regulations and the formation of Forest Guard Groups and Village Forest Management Boards. Furthermore, regular meetings and self-monitoring were key activities under the community contracts, representing the bulk of total time spent at 52% and 35%, respectively. In contrast, under the individual contracts, self-monitoring activities accounted for about 93% of time spent. The reason for this is that other than the monitoring activities, households usually attended only one meeting a year, to receive their

payments. However, households using both types of contract were not active in terms of joining in with official monitoring or with verification activities on the ground.

2.4.4 Benefits of forest management

A breakdown of the benefits obtained by villagers from the forest management activities, using both individual and community contracts, is shown in [Table 2.4](#). Government subsidies and the value of NTFPs collected represented all of the benefits accruing to communities using the community contracts, with firewood and bamboo shoots being the principle NTFPs collected in the study areas. Community members were prohibited from extracting timber in natural forests as of the government regulations, but allowed to collect NTFPs, freely and individually. The basic assumption used was that every household collected NTFPs from the common forest. On average, about 9% of total firewood and 25% of the total number of bamboo shoots collected came from the common forest, though these proportions varied among communities due to their varying distances from the forests, the availability of NTFPs in those forests, and the availability of NTFPs from other sources like the households' own forests and gardens. The value of NTFPs collected by each community under the community contract was therefore calculated by multiplying the average volume of NTFPs each household collected from the common forest by the number of households, and by the average prices of NTFPs in the local market. Members of all communities also had the chance to extract a limited volume of timber from the common forests for the construction of new houses. However, this happened little over the past 5 years of the project, so was not included in this analysis. In general, all the communities derived the same set of benefits from their forest management activities.

Table 2.4: Monetary benefits per hectare per average year derived from project forest management activities: individual and community contracts

	Individual contract		Community contract	
	Value in 2011 (US\$)	Share (%)	Value in 2011 (US\$)	Share (%)
Government subsidy	56.0	17.5	6.9	18.0
NTFPs	203.4	63.4	31.5	82.0
Auxiliary tree extraction	61.5	19.1	-	-
Total benefits derived	320.9	100.0	38.4	100.0

Source: Own data, household in-depth interviews and focus group discussions 2012

When asked about the benefits gained from participating in the forest management program, one farmer in village Co2 said, “*Without forest protection, everyone loses, such as water for production and consumption activities. With forest protection, then as well as retaining our water sources, we can also collect firewood*” (G_DCTL2). In addition, a farmer in village Da3 stated the following about the function of the forest: “*Those who live near the rivers and springs would be washed away due to floods if there were no forests. In recent years, almost no households have been forced to move,*

except those who live on steep hillsides” (G_CSN). One government official– a village headman– stated, “Forest land was protected, and the environment was also protected. There was less erosion and landslides. Furthermore, we received subsidies from the government. At the end of each year, households received about 200,000 to 300,000Dong. With this money, we did not have to contribute to the security fund and the village fund for flood prevention using our own money, meaning we did not have to sell chickens to contribute to the fund” (G_ETM).

In contrast to the limited access to natural forests under community contracts, households derived more benefits when operating the individual contracts, as they were allowed to extract both auxiliary trees and a certain proportion of woody trees on their own contracted planted forests. Income sources when using these contracts included the government subsidy, firewood consumption, which was later converted into monetary value based on its price in the local market, and the sale of bamboo shoots, adult bamboo and acacia. No woody trees extraction took place during the program, because it takes 30 to 40 years for woody trees to mature. Bamboo had been planted for three years, and was extracted annually. The benefits derived from acacia were extrapolated based on the findings of a study in Da Bac district in 2012, as this tree is not harvested until it is nine years-old (Manasboonphempool and Zeller, 2012)⁹; meaning that none had been harvested among the interviewed households. Average revenue per hectare was used in this study to estimate the benefits derived among households who planted woody trees and acacias.

In general, NTFPs consumption and sales accounted for a large proportion of the total benefits derived under both types of contract; 63% and 82% under the individual and community contracts respectively. The fact that NTFPs contributed a large proportion of the overall benefits implies that the forest is a principal source of firewood for those who live nearby.

2.4.5 Benefits and costs of forest management

[Figures 2.2](#) and [2.3](#) give a comparison of the costs and benefits of forest management activities across the five study communities, and between the two types of contract.

⁹ These data were obtained from a study conducted in Da Bac district in 2012, and the authors have allowed us to use the data in our article.

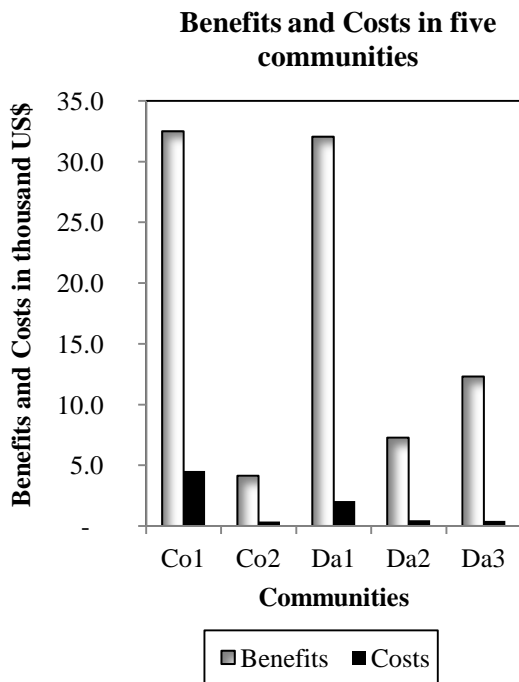


Figure 2.2: Benefits and costs under the 5-year forest management contract across the five communities

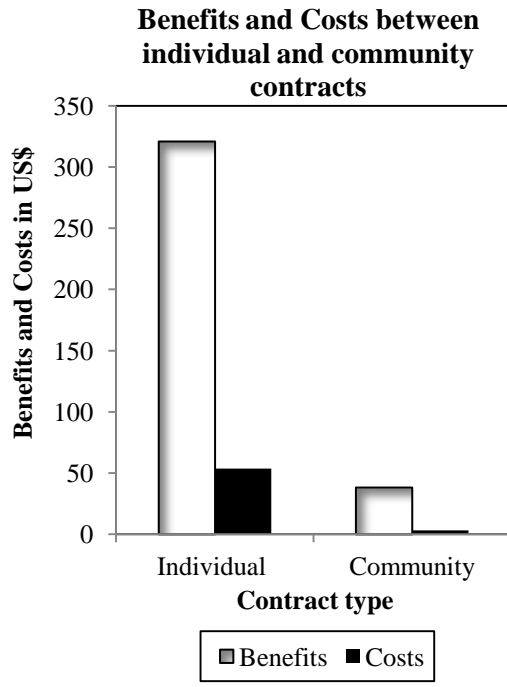


Figure 2.3: Forest management benefits and costs per hectare per year by contract type

These data were obtained by multiplying the transaction cost days for forest management activities by the average monetary value of a labor-day over the whole year (Manasboonphempool and Zeller, 2012)¹⁰. The opportunity costs of labor in each village, however, were adjusted based on the assumption that the chance of obtaining off-farm work varied among the five villages, depending on their distance from the district center and the quality of the roads. Accordingly, the five communities were classified into three groups, with each group given a different proportion of the total labor-day value. Specifically, if the monetary value of a labor-day in Co1 was considered as 1, it valued at 0.5 in Co2 and Da1, and at 0.3 in Da2 and Da3. All communities showed a positive net benefit, but the values varied significantly among the study communities. The total net benefits for the 5-year contracts were the highest for village Da1 (US\$29,983.2), followed by Co1 (US\$27,966.8), Da3 (US\$11,899.3), Da2 (US\$6,798.6) and Co2 (US\$3,783.6). The variation found was due to the significant differences in (i) the magnitude of transaction costs, (ii) the size of government payments, which depended on the size of the forest area managed, and (iii) the value of NTFPs taken from the common forests.

The average ratios between benefits to transaction cost were relatively high under both types of contract; at an average of 18 and 15.9 for the individual and community contracts respectively

¹⁰ These data were obtained from a study conducted in Da Bac district in 2012, and the authors have allowed us to use the data in our article.

([Figures 2.2](#) and [2.3](#)). This means that participating in forest management activities brought benefits to the households, regardless of whether they used individual or community contracts. These figures also reflect that the real value of government monetary payments and NTFP benefits under the collaborative management framework were lower than under the individual contracts. In other words, the benefits derived from planting *and* protecting a one-hectare new forest were larger than those from individually protecting a one-hectare natural forest.

2.4.6 The net present value of forest management activities

[Table 2.5](#) provides a summary of the net present value (NPV) per household and per hectare of forest under the community contracts. These data were obtained in the following ways. First, the benefits and transaction costs for each year of the entire contract were converted to US Dollars using exchange rates from the World Bank (World Bank, 2012a). Second, a constant discount rate was used to derive the present value of both past and future net benefits at the start of the contract in each community with a time horizon of 5 years. As the communities started the program at different points in time, those NPV values were then discounted to the values existing in 2011, to allow comparison between communities. According to World Bank statistics, the average annual inflation rate over the period of 1999 to 2012 in Vietnam was 7.7% (World Bank, 2012b). Therefore, a constant discount rate of 10.7%, three percent higher than the average inflation rate, was used to calculate the NPV for this study, to take into consideration the opportunity cost of money in addition to inflation. This value is close to the lending interest held at bank in Vietnam during the years under consideration.

Table 2.5: Net present value of forest management activities under the community contract

Village	Area (ha)	NPV per average year (US\$)	NPV per household per average year (US\$)	NPV per hectare per average year (US\$)
Co1	179.1	5,593.4	74.6	31.2
Co2	11.0	756.7	13.1	68.8
Da1	330.0	5,996.6	84.2	18.2
Da2	31.0	1,359.7	16.9	43.9
Da3	180.0	2,379.9	39.4	13.2
Average	146.2	3,217.3	45.7	35.1

Source: Own data, household in-depth interviews and focus group discussions 2012

The forest management NPV per household per year under the community contract was relatively low for all the communities, or about US\$46 on average ([Table 2.5](#)). This indicates that participating in the project forest protection activities alone brought relatively few monetary benefits to the participants. For example, the NPV per household per year was about US\$84.2 for village Da1, the highest among the study areas. As the communities differed a lot in terms of areas under forest, those managing smaller forest areas tended to generate higher NPVs per hectare. For example, the NPVs

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per hectare per year amounted to approximately US\$69 and US\$44 in villages Co2 and Da2 respectively. On average, the NPV per hectare per year for a 5-year contract was US\$35.

A comparison of the NPVs generated between individual and community contracts is given in [Table 2.6](#).

Table 2.6: Net present value (in US\$) per year per hectare of forest, by type of contract and by type of trees planted

Village	Community contracts	Individual contracts	Under individual contracts	
			Households planted woody trees and acacia	Households planted woody trees and bamboo
Co1	31.2	315.9	104.9	456.5
Co2	68.8	315.4	278.7	339.8
Da1	18.2	289.7	156.8	334.0
Da2	43.9	77.0	77.0	-
Da3	13.2	-	-	-
Average	35.1	267.4	144.4	376.8

Source: Own data, household in-depth interviews and focus group discussions 2012

The NPV per hectare of forest per average year under the individual contracts across communities were obtained in the same way when calculating this figure under the community contracts with the exception of a 9-year time horizon. Returns under the individual contracts were much higher than under the community contracts, with an average NPV per year per hectare of forest at US\$267.4 under individual contracts, but only US\$35.1 under the community contract framework. This means that participating in both planting and protection of forests brought much greater benefits than only participating in forest protection.

[Table 2.6](#) also shows a comparison between NPVs for the two types of trees planted under the individual contract. However, individual contracts were not used in village Da3 and only started in Da2 in 2008. Furthermore, Da2 was only offered the choice of planting woody trees and acacia. On average, the NPV per hectare for those planting woody trees and bamboo was higher than for those planting woody trees and acacia. For example, the NPV per hectare for those planting bamboo was about US\$377, but only US\$144 for those planting acacia. The main reason is that planting bamboo brought higher annual revenues from bamboo shoots collection and adult bamboo extraction activities, while acacia can only be harvested once, around nine years after initial planting. In addition, the harvesting of both bamboo shoots and adult bamboo can go on for more than ten years. As a result, it is not surprising that most farmers we interviewed preferred bamboo over acacia.

2.4.7 Assessment of contract monitoring and verification

[Table 2.7](#) gives a summary assessment of the contract monitoring and verification processes carried out by the management boards. Our assessment of the monitoring activities concentrated on the frequency of monitoring and the methods used. About 83% of respondents said that monitoring had not been well organized, due to the low frequency (53%), in some cases its discontinuance (21%), a lack of thoroughness (21%), and even no monitoring at all in some cases (5%).

Concerning the low frequency of monitoring, a farmer in Co2 said, *“The officials monitored the situation only from their office. They brought us money and papers to sign at the end of the year, but we were never told by the management boards that they wished to visit the forest and check on its condition”* (G_DCTL2). In village Co1, a farmer reported, *“They just visited our forest once a year. They needed to visit more often to be up-to-date with the condition of the forest, as sometimes damage was caused by the weather, and not due to the carelessness of farmers, and this might have affected the amount of money the farmers received at the end of the year”* (I_TDC9).

With regard to the lack of thoroughness in the monitoring process, a farmer said, in a group discussion in village Co1, that, *“The officials visited only the village headman. They asked him whether there had been any changes, and if not, they left. Sometimes they rode their motorbikes a bit further from the village center towards the forest, but usually did not go into the forest”* (G_ETM). Another farmer from village Co2 said, *“The village headman always brought the officers to visit the best forest plots, while the bad ones were ignored”* (I_TE1).

In contrast, 17% of the respondents said that the management board had organized their monitoring activities well, as relevant stakeholders were present and the monitoring frequency was sufficient. In these cases, the involvement of relevant stakeholders meant that the management board officials invited households to participate in their monitoring, together with representatives from the commune and village. This process reflects a form of participatory monitoring, as *“households were allowed to join the officers in the monitoring process”* (I_DNL16). Concerning the frequency of monitoring, a farmer mentioned that, *“monitoring was done at the end of every year and that was enough”* (I_DNL15).

Table 2.7: Assessment of the monitoring and verification processes used

	Monitoring (%)	Final verification (%)
Well organized	17.4	34.8
Not well organized	82.6	65.2

Source: Own data, household in-depth interviews and focus group discussions 2012

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On the subject of the annual final verification process, 35% of respondents said it was well organized, meaning households were invited to participate, and that the frequency of once a year was enough. For example, a farmer in Da1 felt that *“the process was quite good because many people were involved, such as the officers, village headman, commune representatives and households”* (I_TP12). However, about 65% of respondents mentioned that the verification process was not well organized, due to its lack of frequency (47%), it being discontinued at times (27%), and its lack of thoroughness (26%). Regarding the thoroughness of the verification process, a farmer in Co1 said that, *“the process took place only in the easily accessible plots, like those near the road”* (I_TE3). Another farmer in village Co2 spoke about the verification process stopping at times, saying, *“I was only allowed to join the process only in the first year. I do not know whether it took place in the following years, though I wanted to participate because I wished to know whether my planted forests were doing well”* (I_TDC14).

2.4.8 Reason for participating in the 5MHRP

Villagers were asked the reasons why they participated in the program, and a summary of their responses is given in [Figure 2.4](#). In total, 31% of respondents said they participated in the program to get hold of the government subsidy for seedlings and money. One farmer in Da1 said, *“I received the seedlings and money from the government, knowing I would be left with my own trees later”* (I_TP13). About 25% of respondents mentioned that they could supplement their income by selling forest products. One farmer in village Co2 said, *“Bamboo shoots could be harvested from the third year onwards, and I was able to earn money by selling them”* (I_TDC7). Some villagers also joined the program as it offered them the opportunity to collect NTFPs such as bamboo shoots, vegetables and medicines, for their own consumption.

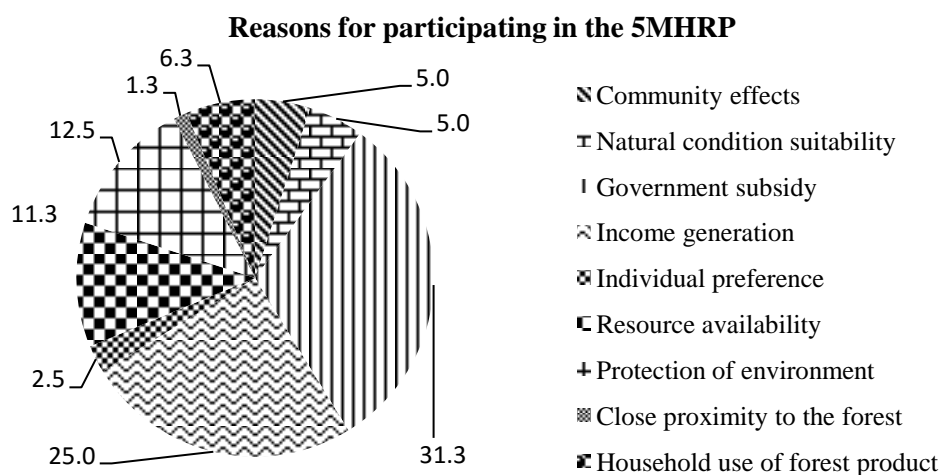


Figure 2.4: Reasons for participating in the 5MHRP

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About 13% of the respondents said they participated for environmental protection reasons, in order to ensure the local area would have fresh air and clean water sources for both production and consumption purposes, and to avoid floods and landslides. For instance, a farmer in Da2 talked about the improved environmental quality of the village, saying “*When travelling to Hoa Binh city I notice immediately that the air there is not as fresh as it is in my village. People there may have to use a fan or an air-conditioner the whole day. When the weather forecast says the temperature will reach 37°C or 38°C, it stays so cool here we still have to use blankets at night. If there were no forest, the environment would not be so pleasant*” (I_DNL18).

2.4.9 Difficulties in the implementation of the 5MHRP

[Table 2.8](#) summarizes the difficulties faced when implementing the program, at all levels. About 32% of respondents said that the difficulties they faced were related to policies, followed by natural conditions (25%), local people’s awareness levels (18%), administrative processes (13%), the operations of the market (8%), the education provided by the local authorities (2%), and illegal logging (2%).

Table 2.8: Difficulties faced when implementing the 5MHRP

Difficulties faced	Province and district (%)	Commune (%)	Community and household (%)	Average (%)
Policy	36.8	21.1	36.4	31.7
<i>Subsidies</i>	21.1	10.5	22.7	18.3
<i>Types of tree</i>	15.8	10.5	13.6	13.3
Natural conditions	21.1	15.8	36.4	25.0
<i>Distance and terrain</i>	15.8	15.8	31.8	21.7
<i>Weather</i>	5.3	-	4.5	3.3
Administration	15.8	21.1	4.5	13.3
Local people’s awareness	21.1	26.3	9.1	18.3
Local authority education provision	5.3	-	-	1.7
Market activities	-	15.8	9.1	8.3
Illegal loggers	-	-	4.5	1.7

Source: Own data, interviews 2012

Subsidy-related complaints included insufficient cash subsidies from the government, no cash given to the communes, and that the geographical distance had not been taken into consideration when determining the amount of the cash subsidy. About 18% of respondents mentioned the subsidies to be a key issue. For example, a district government official said, “*The monetary subsidy from the government was low. At the beginning, it was 50,000 Dong per hectare per year for natural forest protection, then it was increased to 100,000 Dong, and to 200,000 Dong by the end, but was still too low*” (D_MB21). In addition, about 11% of respondents at the commune level said there was no

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monetary subsidy given to the commune. One commune government official talked about this lack of compensation issues, saying *“We participate in all management board activities on the ground, such as contract monitoring and verification, distributing payments to households and communities, and signing the related documents, but we did not receive an allowance”* (C_TM).

The types of trees planted reflects the challenges faced when combining the growing of woody trees for long-term protection purposes with trees grown for a shorter-term economic purpose, with some trees being inappropriate for the local conditions. Fourteen percent of respondents at the province and district levels mentioned the challenges faced when mixing tree types. One district government official, for instance, told us that *“theoretically, the hard woody trees should be good for use in the protection forests, but they grow slowly. From the second year onwards, the auxiliary trees grown for economic purposes, such as bamboo or acacia, came to dominate the forest area as they grow fast. The government wanted to create protection forests that consist of only hard woody trees, but local people did not plant these, as they would have to wait a long time, usually thirty to forty years, before they could extract them”* (D_MB21). In addition, 8% of respondents said that the trees planted were not suitable for their village areas. One farmer in village Co1 said, *“If we had continued to plant acacia, the result would not have been a good one, because the trees were often eaten by mice and squirrels. In addition, they died due to cold weather during the project and we had to plant trees all over again”* (C_TM).

In [Table 2.8](#), ‘distance and terrain’ refers to the poor levels of access people had to the forests due to their distance from the village, or due to mountainous terrain with steep and high hills, fragmented forest plots or dangerous and poor quality roads. About 32% of respondents at the village level spoke about the distance of the forests from their homes and the steep hills they had to overcome. An experienced forestry official in one commune elaborated upon this particular difficulty, stating: *“There were 200 bundles of bamboo seedlings per hectare and each weighed 2 to 3kg. People could carry a maximum of 10 bundles, about 30kg, each time. The distance from the point of seedling delivery to their houses was about 6km, plus about 3km to the forest. Bamboo is difficult to carry and, furthermore, people had to climb hills. It was hard work. There were also difficulties faced with the harvesting. For example, the thick bamboo trees grown by the village policeman had not been harvested since 1999, because the forest was too far. Throwing the bamboo trees from the top of the hill after harvesting usually broke the bamboo, reducing the price fetched at the market. It would have been better if the road had reached the forest. As a result, most villagers only harvested bamboo shoots, and the price of bamboo shoots was quite low during the project”* (C_DC2). One district government official shared his opinion from the point of view of an implementing agency: *“During the initial stages it was hard for us to travel to the forests, and there was no road to the communes. We mainly used boats. The distance from the boat landings to the commune offices was 10 km in some areas, so we had to walk through the forests and climb up hills”* (D_MB21).

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Administration problems included the frequent changes in policy that took place, plus the large number of documents that had to be produced, weak coordination among different administrative levels, boundary conflicts due to differences between the land areas shown on paper and in practice, an asynchronous implementation system, and weak village regulations. Another district government official said, “*We had to use many documents; for example, just for making payments to each household or community, we needed five different documents and six to seven copies of each. We managed about 7,000 households so we had to carry with us two big bags of documents each time we went to a commune*” (D_MB23). Regarding the village regulations on forest management, a farmer in village Co2 said that the “*village sanctions are not strong enough to deter people from violating the laws*” (G_DCTL2).

The *lack of awareness* among local people of the project led to uncooperative responses and behaviors, and to a lack of commitment from local people regarding project activities. Finally, there were difficulties faced with regard to the *market*, as forest products such as bamboo and bamboo shoots tended to fetch a low price.

2.5 DISCUSSION

2.5.1 Implementation of the 5MHRP

The implementation of the *5MHRP* involved a top-down process; a cumbersome system, which operated from the constitutional right down to the operational levels ([Figure 2.1](#)). Both formal and informal institutional arrangements co-existed within the implementation framework, leading to varying forest management practices among the communities and villages, due to the differences in customary laws, norms and rules in place.

The contribution of commune governance was ignored during implementation of the program, so its role in forest management activities was not acknowledged ([sections 2.4.1](#), [2.4.3](#), and [2.4.9](#)). Our interviews with the stakeholders indicated that the communes were effective facilitators, with one provincial government official stating that, “*it is impossible for outsiders to work effectively with local people without the participation of the local authorities*” (P_CCLN). As a consequence, a proportion of the subsidies given to households under the community management scheme was used to compensate the commune government officials in some of the study areas, a move that went against the provisions of the *5MHRP*, which meant that households had to bear the costs of such payments.

As distance and terrain were the major difficulties faced when implementing the program ([Table 2.8](#)), criteria such as geographic distance, availability of forest land resources, and the awareness of local people, became important factors when selecting communes or villages to be included in the program’s scope. Both district and commune government officials acknowledged this by stating that “*there were only a few potential areas nearby the project area and with easy access after 2006. The*

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remaining sites, those not in the program, were basically in very remote areas” (D_MB21). Another officer mentioned that villagers’ knowledge had played a role in helping to identify the suitable sites, because “in 1995/1996, we were encouraged to plant chukrasia (i.e., lát), but the local people were unaware of the benefits of planting such a species, so many of them threw the seedlings away. These experiences led us to select villages more carefully after that” (C_DC2). This implies that the more remote areas had little chance of being selected, meaning that not all local people had an equal opportunity to participate in the program.

The amount of subsidy given was the same regardless of differences in geographic distance, or natural and socio-economic conditions, which in turn discouraged the management boards from implementing the program in remote areas, due to the high transportation costs incurred when delivering seedlings, and when conducting subsequent project activities. Thus, the opportunity for remote areas to participate in the program was further reduced. The selection inequality also negatively affected the quality of the forests planted, as seedlings varied in terms of the soils and climatic conditions they preferred. This last point was mentioned by one provincial government official, who said that *“after the end of the program, there were only a few densely planted protection forests standing; the others were scattered and fragmented. As a result, it was not a clear success” (P_CCLN). Planting unsuitable tree types also led to an increase in opportunity costs and lowered household returns.*

The management boards did not pay much attention to their responsibilities on the ground, such as contract monitoring and the verification process, even though they received administration fees for these activities. For example, a high percentage of respondents (83%) complained about the monitoring conducted by the management boards, and about 65% of respondents were not satisfied with the final verification process, since they felt these activities were not well organized ([Table 2.7](#)).

The monetary subsidy provided by the government was the decisive factor in persuading many local people to participate in the program, with the potential income they could earn a close second ([Figure 2.4](#)). This shows the importance of providing cash subsidies in any future programs introduced. In practice, there was also another, hidden reason why local people decided to join the program. People realized that their livelihoods were being threatened by increasingly strict government policies (such as no more open access to timber for logging), changes in the environment (e.g., floods and landslides), and an increasing scarcity of NTFPs. Therefore, local people felt that they had to do something to prevent the situation from getting worse. A commune government official confirmed this: *“In the past, apart from logging, people could also collect non-timber forest products quite easily. Now, the natural forests are shrinking and people are having to protect what remains or even plant new forests” (C_TL). This indicates that, prior to the project implementation, local people had*

started to appreciate the environmental value of the local forests, so the reason for their participation went beyond simple short-term production gains.

2.5.2 Forest management transaction costs

The time spent attending regular meetings (Widmark *et al.*, 2013) and carrying out monitoring activities formed the bulk of the total time spent by all communities involved in the project (Table 2.2). However, differences in the frequency of monitoring and the monitoring methods used, the time spent on each visit, and the characteristics of the forests (such as size, access levels and distance from the village) resulted in variations in the time spent for monitoring among the communities. This variation also reflected the diverse institutional forest management arrangements in place in the study areas. For example, three of the five communities conducted monitoring by going into the forest, while a fourth observed from outside and a fifth simply posted a person at the entrance of the forest. In addition, some villages paid more attention during certain periods (such as during the crop cultivation season or before the New Year holidays), in addition to carrying out monthly monitoring. Others only monitored once every three months, or even just once a year. Village Co1, for instance, monitored forest activities as often as once every ten days, because its forests were close to the commune and there had been cases of illegal timber extraction and the unauthorized opening of new fields prior to the project implementation. Despite these differences, the number of people involved in each monitoring visit was similar across all communities, because, as one villager put it, “*You need a group of people when entering the forests. Mountains and forests are craggy, so it is very dangerous to go alone*” (G_CSN).

Smaller forest areas per household (less than 1.6 hectares) led to high transaction costs among households operating under individual contracts (Table 2.3). On average, such households spent about 13 labor-days per year managing one hectare of forest, however, if they had managed larger forest areas, less or the same amount of time would have been spent, as some management activities carried out were required regardless of the size of the forest.

The local people acted as foresters instead of forest owners under the benefits-sharing policies in place, but under both types of contracts, households had limited rights in terms of logging, as the trees still belonged to the state (Government of Vietnam, 2001). The forest management benefits flowing from the community contracts mainly had the form of government subsidies and the collection of NTFPs, and the very limited rights given to households regarding conflict resolution and sanctions disempowered the relevant communities. Households therefore received greater benefits under the individual contracts for planting *and* protecting new forests (Table 2.4); particularly those households with the rights to harvest auxiliary trees (e.g., acacia or bamboo), as this activity contributed significantly to overall benefits.

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Relatively high benefit-to-cost ratios were experienced under both types of contract ([Figure 2.3](#)). The compensation payments ideally should have covered all extra costs borne by the households on forest management activities (Mettepenningen et al., 2009), in order to give them an incentive to work hard. These costs included the operational costs involved in producing the environmental goods and services, the production activities and profits foregone, private transaction costs, and the investments that had to be made to enable production of the desired outputs (Mettepenningen et al., 2009). In the study area; however, the government payment was not enough to cover the transaction costs incurred in some areas, particularly if the value of NTFPs was not taken into account ([Table 2.2](#) and [Table 2.4](#)).

The NPV for households per year under the community contracts was low; the highest NPV per household per year was about US\$84 for village Da1 ([Table 2.5](#)). This means that the program participants received relatively little in return for their efforts. The low level of return made it hard for them not to carry out illegal logging and field clearance activities - to support additional crop cultivation, in turn threatening the long-term sustainability of forest management in the area. The NPV per hectare per year under the individual contracts was much higher than under the community contracts ([Table 2.6](#)), whereas the NPV per hectare for planting woody trees and bamboo was higher than for planting woody trees and acacia. These findings reflect local people's preferences for planting bamboo rather than acacia because the former generated annual revenues from the selling of bamboo shoots and adult bamboo after the third year, while acacia could only be harvested once, and only nine years after being planted.

The community-based management scheme introduced under the program helped to minimize conflicts among villagers. For example, the monetary subsidies given by other forestry programs in the past had only been given to those who possessed a Red Book, leaving the natural forests under the control of individual Red Book holders. Local people realized that such forest management practices would be problematic over time, due to boundary conflicts among Red Book holders (as natural forest plots were usually contiguous with each other), illegal logging by non-Red Book holders, and little or no support coming from non-Red Book holders during fires. As a consequence, under the study program, the forests were managed by entire villages, irrespective of whether villagers held a Red Book or not. In addition, benefits had to be shared equally among villagers.

Community-based natural forest management is a time consuming process, so it will only be effective if less time is spent on collective action than on conflict resolution activities with individual contracts. Despite a lower NPV per hectare per year under the community contracts in the study areas, we believe that community-based management is the optimum solution in terms of conflict resolution and maintaining the sustainability of a management program when the natural forest is made up of large, contiguous pieces. This argument is predicated on a benefits-sharing mechanism to be implemented

across all communities and local people to be aware of the benefits flowing from environmental protection activities. The presence of an intangible, cohesive strength within a community also helps make collective action a success. For example, one respondent said, “*Illegal loggers are mainly outsiders. Villagers do not fell trees illegally, because we are afraid of being judged and sanctioned by the others in our community*” (C_TL).

However, due to the much higher NPV per hectare per year under the individual forest management scheme, individual contracts may still be the preferred option if forest plots are fragmented, for in such cases, boundary disputes among individual Red Book holders would be less of an issue.

2.6 CONCLUSIONS AND POLICY IMPLICATIONS

The *Five Million Hectare Reforestation Program*, which was implemented throughout Vietnam in 1998, reflected the government’s commitment to the introduction of sustainable forest management in the country. Our study used a transactional approach to quantify the time and costs incurred, and benefits obtained, by households participating in the program. The study also applied a qualitative approach to understand: (i) the principal stakeholders and their roles in the implementation, (ii) the underlying reasons for local people’s participation in the program, (iii) the constraints experienced during implementation, and (iv) the performance of the management boards from the point of view of local people.

The main findings from our research are as follows. First, the diversity of informal institutional arrangements resulted in a big variation in transaction costs among communities in the study areas. Second, the transaction costs per hectare per average year were relatively large for households with individual contracts, due to the relatively small size of the forest areas planted and managed. Under the community contracts, regular meetings (52%) and self-monitoring activities (35%) constituted the greatest proportion of total transaction costs, while in the case of individual contracts, the main transaction cost component was self-monitoring activities, at 93%. The time spent on conflict resolution and official monitoring and verification activities was relatively small for these households. Third, although both types of contracts had relatively high benefit-to-cost ratios, the benefits mainly came from the collection and sale of NTFPs such as bamboo shoots and firewood, and not from the government’s subsidy. Fourth, the NPV per hectare per year was higher for households under the individual contracts than for those under the community-based contracts. Fifth, our empirical study indicates that the low level and fixed form of the subsidy, the trees’ lack of suitability for local conditions, the long distances from the villages to the forests, and the issue of conflicts and a lack of awareness among local people, were the principal difficulties faced during the program’s implementation. These difficulties occurred at all levels and increased the transaction costs incurred by program activities.

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The main limitation of our study was that neither resource appropriation nor production costs were included in the analysis. Accordingly, the time spent collecting, processing, and transporting forest products from the forest to the house, and production costs like building and repairing fences, fire breaks, forest trails and footpaths, and the costs arising from the damage to crops and livestock caused by wild animals had been excluded. The benefits enjoyed by households might have been lower if these costs had been considered.

Our research shows the importance of transaction costs analysis when dealing with natural resource management activities, and particularly when evaluating policies, as already highlighted by Mettepenningen *et al.*, (2009). High transaction costs can become a barrier to households participating in environmental management programs (Falconer and Whitby, 1999), and can also reduce the real benefits derived. A full understanding of the different transaction cost components and their roles can help policymakers develop alternative approaches in order to increase the net benefits passed-on to participants. For example, in order to promote community-based forest management using community contracts, a larger government subsidy should be provided, to match the amounts derived from individual forest management contracts. The government should also increase payments under the individual contracts, to improve the quality of the forests and to encourage the use of woody trees. These payments would compensate farmers for having to forego the more lucrative auxiliary trees, such as acacia or bamboo, in the short term. The subsidy package could also be improved by providing better seedlings and fertilizers. In the context of a limited national budget, investment should be focused on the most fragile locations, such as watersheds and steeper slopes. In addition, natural and socio-economic conditions should be taken into account when deciding on which types of trees to provide and grow, and the size of the subsidy offered.

One policy implication from this study is the need to empower local communities ([section 2.4.3](#)) and local authorities ([section 2.4.1](#) and [section 2.4.9](#)). Recognizing their key role and giving them more autonomy with respect to natural resources management, would encourage their participation and a sense of responsibility among local people. For example, benefits-sharing policies should be considered; to give more rights to local people and encourage them to become forest owners. Communities should also be given more power in terms of imposing fines, as this would not only strengthen their role, but also contribute to village funds. Similarly, the local authorities should be given a fee for their involvement in the project's implementation on the ground.

Another implication of this study is related to future research. Implementation of the *Five Million Hectare Reforestation Program* reflected a typical structure for forestry policies in Vietnam, in which government bodies at different levels were involved throughout the process ([Figure 2.1](#)). Employing a cumbersome system like this can lead to high transaction costs within the public sector, an often neglected aspect of policy evaluations, but one that may be as important for efficiency as direct

production costs (Rørstad *et al.*, 2007). Furthermore, such analysis would help identify the scheme or combination of schemes that best minimizes total transaction costs (Falconer and Whitby, 1999). Therefore, it is recommended that studies which focus on the implementation of a national forestry program include the transaction costs borne by the public sector in their analyses, as this will allow that a more comprehensive understanding regarding the effectiveness of forestry policies and programs be developed.

2.7 REFERENCES

- Abdullah, N.M.R., Kuperan, K., Pomeroy, R.S., 1998. Transaction costs and fisheries co-management. *Marine Resource Economics* 13 (2), 103-114.
- Adhikari, B., Lovett, J.C., 2006. Transaction costs and community-based natural resource management in Nepal. *Journal of Environmental Management* 78 (1), 5-15.
- Arifin, B., 2006. Transaction cost analysis of upstream-downstream relations in watershed services: Lessons from community-based forestry management in Sumatra, Indonesia. *Quarterly Journal of International Agriculture* 45 (4), 361-376.
- Blore, M.L., Cundill, G., Mkhulisi, M., 2013. Towards measuring the transaction costs of co-management in Mkambati Nature Reserve, Eastern Cape, South Africa. *Journal of Environmental Management* 129 (15 November 2013), 444-455.
- Chambers, R., 1994. The origins and practice of participatory rural appraisal. *World Development* 22 (7), 953-969.
- Coi, L.K., 2012. Forest governance monitoring in Vietnam. Workshop on forest governance assessment and monitoring, Ha Noi, Vietnam.
- Da Bac District Department of Agriculture and Rural Development, 2011. Report No. 231/BC-NN&PTNT dated November 1, 2011 of the Head on district's agriculture and forestry production in 2011. Da Bac district People's committee, Hoa Binh, Vietnam.
- Falconer, K., 2000. Farm-level constraints on agri-environmental scheme participation: A transactional perspective. *Journal of Rural Studies* 16 (3), 379-394.
- Falconer, K., Saunders, C., 2002. Transaction costs for SSSIs and policy design. *Land Use Policy* 19 (2), 157-166.
- Falconer, K., Whitby, M., 1999. The invisible costs of scheme implementation and administration. *Countryside Stewardship: Farmers, policies and markets*. Kidlington, Oxford: Elsevier Science Ltd, 67-88.
- Foundjem Tita, D., D'Haese, M., Degrande, A., Tchoundjeu, Z., Van Damme, P., 2011. Farmers' satisfaction with group market arrangements as a measure of group market performance: A transaction cost analysis of non timber forest products' producer groups in Cameroon. *Forest Policy and Economics* 13 (7), 545-553.

THE IMPLEMENTATION OF THE 5MHRP AND ITS TRANSACTION COSTS

- Government of Vietnam, 1998. Decision No. 661/QD-TTg dated July 29, 1998 of the Prime Minister on objectives, tasks, policies and implementation arrangements for the Five Million Hectare Reforestation Program. Ha Noi, Vietnam.
- Government of Vietnam, 2001. Decision No. 178/QD-TTg dated November 12, 2001 of the Prime Minister on entitlements and obligations of individuals and households allocated or leased with forest or forest land. Ha Noi, Vietnam.
- Government of Vietnam, 2011. Decision No. 09/2011/QD-TTg dated January 30, 2011 of the Prime Minister on poverty line in 2011-2015. Ha Noi, Vietnam.
- Hanna, S., 1995. Efficiencies of user participation in natural resource management. In: Hanna, S., Munasinghe, M., Property rights and the environment: Social and ecological issues. The Beijer International Institute of Ecological Economics and The World Bank, Washington , D.C., 59-67.
- Kuperan, K., Raja Abdullah, N.M., Pomeroy, R.S., Genio, E.L., Salamanca, A.M., 2008. Measuring transaction costs of fisheries co-management. *Coastal Management* 36 (3), 225-240.
- Leffler, K.B., Rucker, R.R., 1991. Transactions costs and the efficient organization of production: A study of timber-harvesting contracts. *Journal of Political Economy* 99 (5), 1060-1087.
- Manasboonphempool, A., Zeller, M., 2012. Data from livelihood survey in Da Bac district, Hoa Binh province, Vietnam, in 2012. Personal communications.
- Marshall, G.R., 2013. Transaction costs, collective action and adaptation in managing complex social-ecological systems. *Ecological Economics* 88 (April 2013), 185-194.
- Mburu, J., Birner, R., Zeller, M., 2003. Relative importance and determinants of landowners' transaction costs in collaborative wildlife management in Kenya: An empirical analysis. *Ecological Economics* 45 (1), 59-73.
- McCann, L., Colby, B., Easter, K.W., Kasterine, A., Kuperan, K.V., 2005. Transaction cost measurement for evaluating environmental policies. *Ecological Economics* 52 (4), 527-542.
- Meshack, C.K., Ahdikari, B., Doggart, N., Lovett, J.C., 2006. Transaction costs of community-based forest management: Empirical evidence from Tanzania. *African Journal of Ecology* 44 (4), 468-477.
- Mettepenningen, E., Verspecht, A., van Huylenbroeck, G., 2009. Measuring private transaction costs of European agri-environmental schemes. *Journal of Environmental Planning and Management* 52 (5), 649-667.
- Ministry of Agriculture and Rural Development; Ministry of Planning and Investment; and Ministry of Finance, 2009. Inter-Ministerial Circular No. 70/2009/TTLT/BNN-KHDT-TC dated November 4, 2009 of the Ministers on revising Circular No. 58/2008/TTLT/BNN-KHDT-TC dated May 2, 2008, and Circular No. 28/1999/TT-BTC dated March 13, 1999 on guidance to manage national budget for the implementation of the Five Million Hectare Reforestation Program. Ha Noi, Vietnam.

THE IMPLEMENTATION OF THE 5MHRP AND ITS TRANSACTION COSTS

- Musole, M., 2009. Property rights, transaction costs and institutional change: Conceptual framework and literature review. *Progress in Planning* 71 (2), 43-85.
- Ostrom, E., 1990. *Governing the commons: The evolution of institutions for collective action*. Cambridge University Press, Cambridge, United Kingdom.
- Ostrom, E., Burger, J., Field, C.B., Norgaard, R.B., Policansky, D., 1999. Revisiting the commons: Local lessons, global challenges. *Science* 284 (5412), 278-282.
- Pearson, T.R.H., Brown, S., Sohngen, B., Henman, J., Ohrel, S., 2013. Transaction costs for carbon sequestration projects in the tropical forest sector. *Mitigation and Adaptation Strategies for Global Change* 19 (8), 1209-1222. This article is published with open access at Springerlink.com. DOI 1210.1007/s11027-01309469-01309468.
- Ray, B., Bhattacharya, R.N., 2011. Transaction costs, collective action and survival of heterogeneous co-management institutions: Case study of forest management organisations in West Bengal, India. *Journal of Development Studies* 47 (2), 253-273.
- Rørstad, P.K., Vatn, A., Kvakkestad, V., 2007. Why do transaction costs of agricultural policies vary? *Agricultural Economics* 36 (1), 1-11.
- Royer, A., 2011. Transaction costs in milk marketing: A comparison between Canada and Great Britain. *Agricultural Economics* 42 (2), 171-182.
- Sam, D.D., Trung, L.Q., 2001. *Forest policy trends in Vietnam*. Institute for Global Environment Strategies (IGES), Miura, Japan.
- Schiffer, E., 2007. Net-Map toolbox introduction. Paper was presented at the Sunbelt Conference of the International Network of Social Network Analysis, Corpu, May 2007.
- Singleton, S., 2000. Co-operation or capture? The paradox of co-management and community participation in natural resource management and environmental policy-making. *Environmental Politics* 9 (2), 1-21.
- Tan, N.Q., Ngai, N.B., Thanh, T.N., 2007. Forest tenure reform in Viet Nam: Experiences from Northern Upland and Central Highlands regions. International conference on poverty reduction and forests, Bangkok, Thailand.
- Van Huylenbroeck, G., D' Haese, M., Verspecht, A., 2005. Methodology for analysing private transaction costs. ITAES deliverable WPG P3D5 (2005), Vol. 5. Integrated tool to design and implement agro environmental schemes. National Institute of Agronomic Research, Paris, France. Available at <https://w3.rennes.inra.fr/internet/ITAES/website/Publicdeliverables/Methodology%20for%20analysing%20private%20transaction%20costs.pdf>.
- Vietnam National Assembly, 2004. *Forest Protection and Development Law 2004*. Ha Noi, Vietnam.
- Wärneryd, K., 1994. Transaction cost, institutions, and evolution. *Journal of Economic Behavior & Organization* 25 (2), 219-239.

THE IMPLEMENTATION OF THE 5MHRP AND ITS TRANSACTION COSTS

Widmark, C., Bostedt, G., Andersson, M., Sandström, C., 2013. Measuring transaction costs incurred by landowners in multiple land-use situations. *Land Use Policy* 30 (1), 677-684.

World Bank, 2012a. World development indicators [Online]. Available at <http://search.worldbank.org/all?qterm=exchange+rate+of+vietnam&title=&filetype=> [Accesses: October 15, 2013].

World Bank, 2012b. World development indicators [Online]. Available at <http://search.worldbank.org/all?qterm=inflation%20rate%20of%20vietnam> [Accessed: October 15, 2013].

CHAPTER 3

THE ROLE OF STATE FOREST ENTERPRISES IN THE PAYMENTS FOR ENVIRONMENTAL SERVICES PROGRAM IN VIETNAM

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Abstract

To promote pro-poor payments for environmental services, it is necessary to identify institutional options that reduce transaction costs and organizational problems associated with establishing and maintaining many contracts with small-scale ecosystem service providers. This study examines the dual functionality of state forest enterprises (SFEs) in the implementation of the *Payments for Forest Environmental Services Program* in Vietnam. We consider whether SFEs' involvement in the program could reduce transaction costs and organizational problems. Data were collected from Tu Ly SFE in Hoa Binh province, northern Vietnam and from implementing agencies at various institutional levels; a survey of households participating in the SFE loan program; and two stakeholder workshops in 2014. The results revealed that Tu Ly SFE plays an important role in the livelihood of many farmers. A SWOT analysis exhibited SFEs' advantage over other state agencies in implementing national forest management programs as there are fewer parties involved with greater autonomy and outreach in the district. This study proposes the acknowledgment of SFEs as environmental service providers in their own forestlands and to use SFEs as intermediaries in the *Payments for Forest Environmental Services Program* activities.

3.1 INTRODUCTION

Payments for environmental services (PES) schemes have been implemented in different forms to encourage watershed protection, forest protection, erosion control, climate regulation and biodiversity conservation worldwide. PES focuses on bringing together service providers and users where providers are paid to maintain or improve environmental outcomes. There is an increasing interest in private investments, especially in developed countries such as the United States, Australia and France, based on Coasean economics (Coase, 1960), where transaction costs are assumed to be low, property rights are clearly defined, enforcement agencies are well funded, and an external monitoring system is credible (Clements *et al.*, 2010). In developing countries, government-funded PES plays a major role (Ecosystem Marketplace, 2008; Scherr and Bennett, 2011; Qi, 2014). Unfortunately, these countries (e.g. Mexico, Costa Rica, Uganda) have often unclear land ownership, enforcement of law may be weak, and government agencies have poor capacity and little political support.

With the inception of the Rewarding Upland Poor for Environmental Services (RUPES) (CIFOR, 2013) and the Reducing Emissions from Deforestation and Forest Degradation (REDD+) programs (Zhu *et al.*, 2010), PES schemes are on the rise in developing countries, especially in Asia. Vietnam leads Southeast Asia in PES with a program supported by the government under the decree issued in 2010 on the *Payments for Forest Environmental Services Program* (hereafter, *PFES Program*) (Government of Vietnam, 2010).

Households, individuals, village communities, and organizations working in protection forests, special-use forests, and production forests (those that supply environmental services) are eligible for payments. While environmental benefits can be generated from production forest (Kile *et al.*, 1998; Nambiar, 1999), in practice, PES program is often mixed with the Government of Vietnam's effort to promote plantation of fast-growing tree species (e.g. *Acacia mangium*, *Acacia auriculiformis*) as came up from the *Five Million Hectare Reforestation Program* (known as *Program 661*), (Government of Vietnam, 1998). While this paper focuses on such efforts and the challenges it faces from the perspective of transaction cost and the overall institutional set up for PES program implementation, it also acknowledges the fact that plantations as a form of land use does not always correspond with sustainable forest management, especially in relation to heavy loss of biodiversity it may cause (McElwee, 2009; Šálek and Sloup, 2012; Šálek and Výlupek, 2012).

The *PFES Program* in Vietnam involves both large transaction costs (Liss, 2008; Thuy *et al.*, 2013) and operational costs due to the centralized management system (Phuc *et al.*, 2012) and the many contracts with small-scale ecosystem service providers. Effective PFES implementation requires substantial coordination between several government agencies. To promote sustainable PFES, it is necessary to identify institutional options that reduce transaction costs and organizational problems.

To date, limited research is available regarding innovative ways in reducing transaction costs of PES programs. In this paper, we examine the potential role of the re-vamped SFEs in managing some aspects of Vietnam's *PFES Program*. We explore the dual functionality of SFEs as environmental service providers in their own forest lands and as intermediaries in *PFES Program* activities outside their areas of administration. We review existing policies, while considering the feasibility of the proposed arrangement, and acknowledging the perceptions of stakeholders. We account for the shortcomings of SFEs without a lengthy repetition of the details which can be found in the many reports on the processes of forestry reforms (Nguyen *et al.*, 2010). From a scholarly perspective, we contribute to current research on transaction costs (e.g., Liss, 2008; Sikor and Tan, 2011; Sommerville *et al.*, 2011; Phuc *et al.*, 2012), which largely addressed implementation issues, particularly with regard to group-based forest management versus individual farmer contracts.

The remainder of this chapter is structured as follows: [Section 3.2](#) presents a conceptual framework and the research methodology; [Section 3.3](#) reviews the policies and legal framework of SFEs and analyzes the operation of Tu Ly SFE as a case study; [Section 3.4](#) provides a SWOT analysis of Tu Ly SFE; and [Section 3.5](#) provides conclusions.

3.2 CONCEPTUAL FRAMEWORK AND METHODOLOGY

3.2.1 Conceptual framework

We consider four criteria that we view as essential in ensuring the long-term success of a PES program: (i) acceptability, (ii) impact, (iii) costs, and (iv) financial sustainability of PES schemes ([Figure 3.1](#)).

Acceptability - PES programs can be formulated to account for the different motivations of service providers and service users. On the one hand, PES schemes must generate revenue which is necessary for service providers to ensure they implement and maintain sustainable forest management or land use changes that will, in turn, produce environmental services (Nguyen *et al.*, 2013). Acceptability of the terms and transaction costs (monetary and non-monetary) of participating in PES schemes must be addressed (Falconer, 2000; Mettepenningen *et al.*, 2009). If incentives are not acceptable, potential service providers are likely to ignore them in their private decision making, leading to environmentally sub-optimal land use decisions. Among others, payments must account for the opportunity costs of the service providers. Pricing and other income generating opportunities are important in the design of PES programs, especially when service providers must modify their livelihood strategies or change their methods of production.

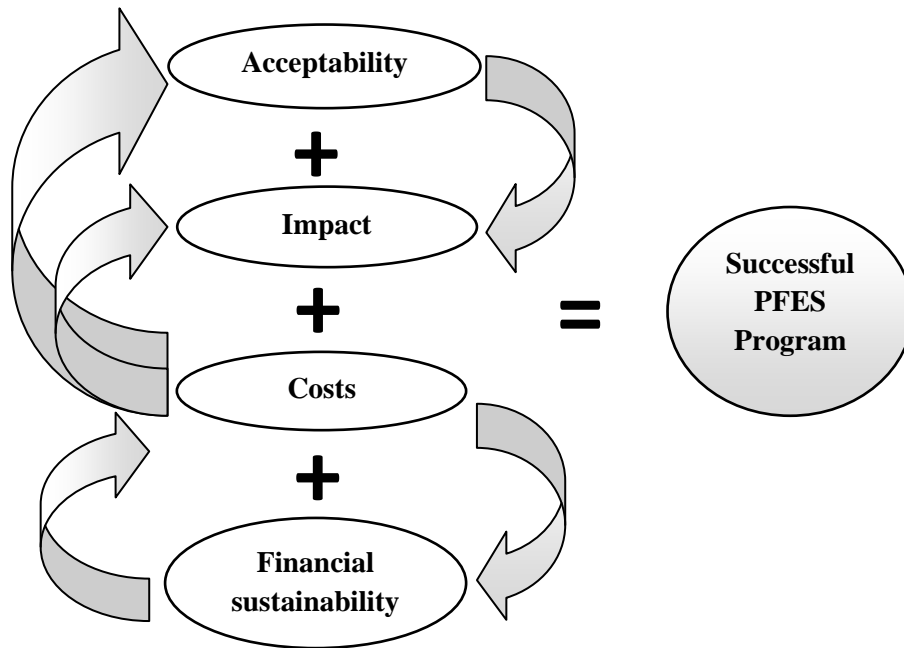


Figure 3.1: Key criteria of a successful PFES Program

Source: Own depiction

To encourage SFEs in Vietnam to participate in the government’s *PFES Program* as service providers, acceptable regulations, payments and incentives must be carefully considered. Innovative incentives may attract SFEs to adopt sustainable forestry practices. By recruiting SFEs as monitoring agencies of forest activities outside their administrative areas, SFEs will create additional sources of income to boost their financial viability.

On the other hand, payments should be within the capacity of the service users and set at a fair level (Kronenberg and Hubacek, 2013). In Vietnam, the PFES value has been pre-determined by the government. Hydropower operators pay 20 Vietnam dong (VND)/kwh (USD 0.001/kwh) while water supply companies pay 40 VND/m³ (USD 0.002/m³) and tourist organizations pay 1% - 2% of their annual income. Because the program is a legal instrument, the service users must accept the pre-determined level of payment. The government is currently revising its PFES valuation (Litzenberg, 2013). The valuation of the PFES is beyond the scope of our study, but we note that the level of payment should be acceptable to the service user.

Impact - In developing countries, PES schemes are often designed to achieve both environmental and poverty reduction objectives (Tallis *et al.*, 2008; Gauvin *et al.*, 2010; Dunn, 2011) but can be challenging (Zilberman *et al.*, 2008). Some authors have tried to link the benefits of PES to poor service providers (Bulte *et al.*, 2008; Wunder, 2008; Zilberman *et al.*, 2008; Milder *et al.*, 2010). Poor farmers can benefit from PES (Pagiola *et al.*, 2005) if they can provide the services at low cost and if the labour requirement is reasonable (Scherr *et al.*, 2006).

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While considering SFEs as both participants in and agents of the *PFES Program* in Vietnam, their role in engaging poor families in their areas needs to be considered. Outreach to poor households must take precedence over any special considerations given to those individuals with special connections to SFEs.

Costs - This criterion refers to the costs that government incurs due to the implementation of the *PFES Program*. These costs may need partially or fully be financed by taxpayer's money be it of a domestic or foreign source. It is therefore important to review whether a *PFES Program* is effective given its cost. The targeting, negotiating, contracting, and monitoring costs of PES schemes can be substantial in many contracts with small-scale service providers (FAO, 2007; Sommerville *et al.*, 2011). Strategic use of intermediaries can improve coordination, while reducing monitoring and transaction costs (Dunn, 2011). Given the extensive geographic distribution of forests, a variety of organizations and persons may be involved in monitoring efforts. Consequently, the mandate given to these agencies, their capacity (funding, skills and experience of personnel, organizational design), and the way in which they interact (institutional structures and arrangements) will determine the success of the system (FAO, 2001).

Financial sustainability - Financial sustainability requires that revenues are sufficient to cover the ongoing costs of a PES program (Mayrand and Paquin, 2004). Revenues can come from taxes, user fees, state subsidies, and grants from international organizations. If PES users accrue large benefits, such as in the case of hydropower operators benefitting from wise management of land and water resources in upstream areas, they will have an incentive to participate in a PES program (Arias *et al.*, 2011). Pagiola *et al.* (2005) note that the financial sustainability of a PES scheme ensures the stability of income for environmental service providers. In some contexts, government financed PES may be the only option. In Vietnam, hydropower companies allocate a portion of their income (USD 0.001 per kwh of electricity sold) to an environmental fund as per government directives. Whereas many private PES agreements fail (Landell-Mills and Porras, 2002; Todorova *et al.*, 2013) over time, due to inadequate or insecure funding, the Vietnam directives ensure continued sources of funding for PFES in hydropower watershed areas.

3.2.2 Research methodology

We consider potential dual functions of SFEs in Vietnam in relation to the newly promulgated policy of PFES. To understand the organizational strengths and weaknesses of SFEs, and how these correspond with their potential roles as environmental service providers, we examine three elements: 1) the policy and legal framework of SFEs in Vietnam; 2) pilot studies of PFES implementation in Lam Dong and Son La provinces; and 3) Tu Ly SFE's involvement in PFES pilot programs in Hoa Binh province in northern Vietnam. The PFES scheme in Lam Dong was implemented through SFEs,

while the pilot study in Son La involved communities and households (Tan, 2011; Phuc *et al.*, 2012; Thuy *et al.*, 2013; Bac *et al.*, 2014).

We review the policy and legal frameworks of SFEs in Vietnam to determine if the new organizational and institutional frameworks are conducive for SFEs to participate in and mediate PFES projects. In addition, we examine the operational procedures of the Tu Ly SFE and its access to resources with a SWOT analysis.

Our empirical data are based on (i) interviews with Tu Ly SFE employees, (ii) interviews with civil servants from implementing agencies at various institutional levels, (iii) a survey of households participating in the SFE loan program, and (iv) the outcomes of two stakeholder workshops held in Hanoi and Ho Chi Minh in 2014. We also interviewed key stakeholders at the provincial and district levels. We used semi-structured questions in our quantitative household survey, with which we gathered information on the costs and benefits of joining the Tu Ly SFE loan program. We also interviewed individuals paid by the enterprise to plant and manage forest parcels.

3.3 RESULTS

3.3.1 Policies and legal framework of SFEs

SFEs have played an important role in the forestry sector in Vietnam. After the country's independence from French colonial rule, 6.3 million hectares of forest were managed by SFEs under the supervision of the Ministry of Forestry from 1954 until 1986 (MARD, 2001 as cited by Sikor and Tan, 2011). SFEs were mandated to protect forests and silvicultural management to meet logging quotas stipulated by the government. However, SFEs were criticized for ignoring their role in forest protection and for prioritizing optimization of timber production to meet the increasing demand for forest products. Many blamed the SFEs for the rapid decline in Vietnam's forest resources (Sikor, 1998; de Jong *et al.*, 2006; Tan *et al.*, 2008; Nguyen *et al.*, 2014).

In 1987, when the *Doi Moi* economic reform was launched with the goal of creating a socialist-oriented market economy, the budget for SFEs from the central government were gradually reduced with less centralized control of the forestry sector (Artemiev, 2003). Many non-productive SFEs were dissolved. However, the reforms did not provide sufficient incentives to develop sustainable and commercial forestry (Artemiev, 2003). Consequently, Vietnam faced a continuing decline in area under forest cover until the mid 1990s (Nguyen *et al.*, 2010).

Despite heavy criticism of SFEs, including having paid too little attention to their responsibility for protecting forests (Dang, 2001) and the inability of some to be financially sustainable (EASRD, 2005), the government of Vietnam recognised the important role played by these enterprises. Although the practices of SFE did not fulfil all forest ecosystem services, the plantation forests they

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managed played a vital role in the provision of environmental services when compared to agriculture and other forms of land use. Thus, continued efforts were made to reform their organization and management.

Since 1991, forest management policies and practices in Vietnam have substantially changed. A state-run system has evolved into a new system that includes households and communities as actors in forest and land management. In the past, lands with slope greater than 25 degrees and those designated for forestry purposes, were placed under the management of SFEs, under the authority of provincial and district governments. In 1991, the *Law on Forest Protection and Development* moved forest ownership toward households, individuals, village communities and the private sector, signaling a consequential break with SFEs. Over the following years, numerous decrees, decisions and guidelines were promulgated regarding the reallocation of land and the devolution of land use rights to private organizations and households ([Table 3.1](#)).

Table 3.1: Important policies relating to SFEs and PES in Vietnam from 1991

Year	Document	Relevance to state forest enterprises
1991	Law on forest protection and development	New policy designated households to replace SFEs as basic managers for forest and forest lands
1992	Decree No. 327-CT : National forest protection <i>Program 327</i>	Policies for the use of bare land, denuded hills, forest, alluvial flats, and water bodies. Funds for the program come from State budget, payments of natural resource tax from forestry activities, bank loans, and international sources.
1992	Decree No. 264/CT: Policies encouraging investment for forestry development	Provides grants for projects under management of a state enterprise within the field of protection and development of special-use forests, protection forests in critical watersheds, and forests producing large logs
1993	Circular No. 32-TC/DT: Guidelines on management and provision of credits from the State for programs and projects for use of bare land, denuded hills, forests, alluvial flats, and water bodies.	Funds from the State budget are to be provided in the form of credits for basic construction and non-commercial economic purposes to project implementing agencies such as new and operating forest enterprises.
1993	Law on land	SFE authority limited over natural forests, which contract farmers for the management and protection.
1994	Decree 02/CP: Allocation of forestry land to organizations, households and individuals for stable and long term use for forestry purposes	Allocation of land with natural forest, land under (or zoned for) afforestation for long-term use, rights and responsibilities.
1995	Decree No. 1-CP: Regulation on the allotment of land by State-owned businesses for agricultural production, forestry and aquaculture	Instructions for allotment of state-owned land to households and individuals in the locality but also to organizations who invest in forest production such as SFEs. Includes rights and obligations of the beneficiaries. The state-owned enterprises can allocate land to households and individuals by making contracts to protect the soil.

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1998	Decision 661/QD-TTg: Target, task, policy and organization for implementation of the project on planting of five million hectares of forest	Afforestation of five million hectares. Provided a continuing source of government cash-flow to SFEs that have protection forests and delayed the need for hard decisions on future viability as stand-alone business enterprises (EASRD, 2005)
1999	Decree No. 163/1999/ND-CP: Assigning and leasing forestry land to organizations, households and individuals for stable and long-term use for forestry purposes	Continuing efforts on the devolution of land use rights to private organizations and households.
1999	Decision 187/QD-TTg: Renewal of the organization and managerial mechanism at the state forestry farms	Renovation of SFEs through a clearer separation of government's business and public sector functions, abolish government subsidies, transformation of some State forestry farms into Managing Boards of protection forests and conversion of some State forestry farms into other forms of business organizations.
2002	Decision 82/2002/QD-TTg: Vietnam Environment Protection Fund	Establish mechanisms for retaining and allocating environmental charges and fee, and allocation to ecosystem services providers (including SFEs) and activities.
2003	Law on land (revised)	Specifies responsibilities of all land users to manage the lands assigned or leased to them.
2004	Resolution No. 200/2004/ND-CP: Rearrangement, innovation of forest enterprises.	Continuing the restructuring, renovation and development of SFEs with provisions on efficient land use, forest development/protection, land allocation, etc.
2004	Law on forest protection and development (revised)	Clearer framework for the management, protection, development and use of forests; and SFEs' rights and obligations. Protection forests may be assigned or leased to commercial enterprises. Setting environmental charges and fees were the responsibility of the government.
2008	Decree No. 380/QD-TTg: The pilot policy for payment for forest environmental services	Established the basis for the development of a national policy on payment for forest environmental services including rights and responsibilities of payers and payee. Payees are forest owners which includes organizations (including SFEs), households and individuals who manage, protect and develop forest.
2008	Decision No. 114/2008/QD-BNN: Vietnam Forest Protection and Development Fund	Establishment of the Vietnam Forest Protection and Development Fund to mobilize, receive, manage and use financial resources for forest protection and development activities under the control of the Agricultural and Rural Development Ministry's management.
2010	Decree No. 99/2010/ND-CP: Policy on payments for forest environment services	Regulates the policy on payments for forest environment services including types of services, users and providers (including SFEs), rights and obligations, and responsibility of the State.
2012	Decree No. 57/QD-TTg: Forest Protection and Development Plan	Forest protection and development plan for the period 2011-2020 to manage available forests and increase forest cover. This plan was developed after the end of the 5 million hectares reforestation project.

Source: Authors' compilation

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SFEs remained active in government programs. When *Government Decree 327* was implemented in 1992, SFEs were recruited for their experience and expertise in directing forest programs. In 1999, SFEs became fully autonomous commercial enterprises, while SFEs managing the more protected forests were transformed into Protection Forest Management Boards (hereafter, PFMBs). To date, SFEs manage 15% of Vietnam's natural forest and 17% of its production forest, a substantial portion of the reported 13.36 million ha of forest cover in the country (MARD, 2012c).

In 1998, the government launched *Program 661* with a provision of continuing government cash-flow to those SFEs with protection forests. SFEs participated in the program under the category of large forest owners, and SFEs played the role of implementing government agencies by contracting, directing, monitoring and evaluating contract fulfillments with households in their areas. At the same time, SFEs were assigned responsibility for achieving the program's objective of planting production forests in the two phases of 1998 to 2000 and 2001 to 2005, via preferential loans.

In 1999, the government began restructuring the SFEs throughout the country, transforming them into forest companies with the right to control and implement accounting mechanisms, and to be self-financing, while taking the responsibility for forest production and trading. SFEs managing the more protected forests were transformed into PFMBs, acting as non-productive organizations. To date, SFEs manage 15% of Vietnam's natural forest and 17% of its production forest, a substantial portion of the reported 13.36 million ha of forest cover in the country (MARD, 2012c).

In 2004, *Government Decree 200* was promulgated to accelerate the reform of provincial SFEs to resolve some of the recurring problems related to land allocation conflicts and to address the reluctance of some SFEs to relinquish their management power over forest areas to local households and communities. SFEs managed government projects, such as *Program 661*, by entering into contracts with farmers in their areas to plant and protect new forests or to plant production forests. SFEs also stimulated the local economy through the employment of local farmers. In 2007, more than 20,000 farmers were employed by SFEs to maintain seedling nurseries, plant and prune trees, and maintain forest firewalls (FAO, 2009). Also, the *2004 Law on Forest Protection and Development* includes a framework for valuing forest use rights and for estimating the value of planted production forests in the ownership of SFEs.

The *Forest Protection and Development Fund* was established in 2008 to enable the forest sector to meet the demand for environmental services and to increase revenues through PFES. The Fund is expected to raise US\$2 billion by 2020 (FAO, 2009). According to the *Vietnam Forest Protection and Development Fund* (VNFF), hydropower contributes 98% of total PFES payments.

At present, the transaction and operation costs of many implementing authorities at all levels substantially reduce the net funds available for households and communities protecting the forest in

Vietnam. For instance, Thuy *et al.* (2013) report that the *PFES Program* in Son La spends most of the 10% of its revenue from the PFES on checking forest protection performance and disbursing funds to 3,500 households. The program requires more funding to reach out to all 64,000 forest owners. The PFES decree states that only 10% of the total revenue from the PFES buyers will be retained for operating costs, including administrative and transaction costs. The costs of monitoring compliance with PFES agreements also are high (Phuc *et al.*, 2012; VNFF, 2013).

3.3.2 State forest enterprises in forest management

Tu Ly SFE was established in 1978 with operations on 4,612 hectares of sloping lands. Like all SFEs in Vietnam, Tu Ly SFE began as a provincial government program. Tu Ly SFE's private operations include the management of an acacia plantation forest and government projects, such as Program 661. Tu Ly SFE became a private entity contracting with households managing 10% of the enterprise's forest. They have continued to provide non-collateral loans to households under contract, but at higher annual interest rates, ranging from 5.4% to 8% in 2000.

In 2004, Tu Ly SFE found itself operating as a subsidiary of Hoa Binh Forestry One Member Limited Company, and at the same time as a district PFMB. As a district PFMB, Tu Ly SFE protected 1,000 hectares of forest for the government. They received payment for the services they provided. They also managed 1,000 hectares of production forest as an enterprise. One of the challenges in the implementation of *Government Decree 200* is the availability of SFE funds and loans (EASRD, 2005). Many SFEs experienced difficulties in operating as both a forest business and a single-member limited enterprise, due to the shortage of capital for implementing their activities (MARD, 2012c). Tu Ly SFE was able to continue operating as a subsidiary of the Hoa Binh Forestry One Member Limited Company, which funded their operations through loans from the Bank for Investment Development of Vietnam (at 8.4% interest), the Vietnam Forest Corporation (at 9.6% interest), and from their own revenues. The main concerns of the enterprise are what they termed to be 'high interest rates' and the more stringent lending criteria recently imposed by the banks, making access to financing difficult. The burden of high interest rates has been passed on to the contracts with the farmers, making it difficult for the SFE to recruit more farmers to agree to the conditions of the forest management contracts. The new contracts, as of 2011, include loan interest rates as high as 16%. SFEs throughout Vietnam faced similar difficulties, which led to the dissolution of some enterprises. There is a need to resolve the difficulties faced by SFEs regarding access to funds and unacceptable contracts. In 2011, Tu Ly SFE re-allocated some of its land to the local community and farmers, thus reducing their productive assets to 2,583 hectares.

Tu Ly SFE has existing contracts with 15 households in Da Bac district managing 10% of the enterprise's forest land. Tu Ly SFE provides non-collateral loans to the households for the purchase of forest plantation inputs. The households can apply for a maximum of US\$ 500 per hectare, per year,

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with end-of-term payment after seven years, when farmers are allowed to harvest the plantation forest. The remaining 90% of the SFE land is managed directly by the enterprise, which hires local farmers to plant and maintain the SFE forest.

3.3.3 Acceptability and impacts of SFEs

We explore the perspectives and experiences of farmers participating in forest management through the Tu Ly SFE. We summarize the household characteristics and forest activities of groups representing three models of SFE involvement with local residents: (i) households hired by Tu Ly SFE to establish and manage the forest (i.e., wage labor contracts), (ii) households under contract to Tu Ly SFE to plant forests (i.e., forest plantation contracts), and (iii) households under contract to with Tu Ly SFE and also hired for labour purposes by the enterprise ([Table 3.2](#)).

In 2013, Tu Ly SFE hired 321 people for 14,200 person-days for land preparation, digging holes, planting, and tending the new forests. Farmers were paid, on average, US\$ 6 per day. 67% of households interviewed revealed that employment from Tu Ly SFE contributed to their improved economic situation ([Table 3.2](#)). A substantial portion of their annual income came from wages paid for forest protection and management. Those with contracts also reported an increase in their income. Between 2000 and 2010, Tu Ly SFE had contracts with 73 households to manage 314 hectares of forest, while acting as intermediaries for government programs such as Program 661.

Table 3.2: Household characteristics of respondents under contract with Tu Ly SFE or hired by the enterprise

Household characteristics	Unit	Households hired by Tu Ly SFE (n=6)	Households with contracts with Tu Ly SFE (n=5)	Households hired by and contracts with Tu Ly SFE (n=3)
1. Average size of household	people	5	4	3
2. Literacy	%	88.0	86.0	83.0
3. Average contracted forest area	ha		2.06	1.77
4. Average loan taken with SFE	1,000 VND		9,000	23,000
5. Man-days per year hired	man-day	32.5		83.3
6. Income from SFE employment	%	26.0		40.0
7. Economic situation improved from SFE employment	%	66.7		66.7
8. Received training from SFE	%	16.7	60.0	33.3

Note: 1 USD = 20,800 VND

Source: Own data

It is possible that Tu Ly SFE favours some households in the area. Those with contracts are hired more often and received bigger loans. Similar issues were raised in the Lam Dong PES pilot study. The impact of PFES on rural poverty alleviation in the pilot study came under scrutiny when

households without pre-existing contracts with the SFEs were excluded (Phuc *et al.*, 2012). In their defence, Tu Ly SFE justifies hiring households with contracts to help those households recover the high cost of the loans. The 16% interest rate has discouraged many farmers in the area from participating in the Tu Ly SFE program. For the period 2013 to 2019, the enterprise has entered into contracts with only three new households.

All of the respondents gained knowledge in forest plantation and protection during their employment. Although Tu Ly SFE does not provide formal training to their contract farmers, they provide technical guidance as needed. According to Dunn (2011), exposure to these kinds of activities can develop long-term behavioural change among households and individuals toward environmental issues.

Most of the households were open-minded about the potential of forest management as an alternative livelihood, but expressed the need for more land for forest production and better contract terms. Households also stated they would be more active in Tu Ly SFE contracts, if they were given interest-free loans. In addition, the current contracts emphasize conservation and protection, which for some, is a disincentive to participate, as there are too few livelihood opportunities with immediate gains. Although the contracts clearly state the responsibilities and benefits of the SFE and the contract farmer, there is no clear statement regarding the use of non-forest timber products (NFTPs) such as honey, herbs, fruits, firewood, and bamboo. Also, tree species selection is highly centralized, with defined management rules, making the terms inflexible. There is consensus that contracts should have attractive terms and conditions, such as reduced or zero interest rates on loans, and provisions for increasing revenue through access to NFTPs.

3.3.4 Costs and financial sustainability of SFEs as intermediaries

The main threats to the *PFES Program* in Vietnam are the high costs, at provincial- and district-levels, which reduce the net funds available for households and communities with contracts to protect the forest. Winrock International and the Center for International Forestry Research have stated that monitoring of forest cover and quality is costly for the government (Thuy *et al.*, 2013; Nga, 2014b) and local government agencies do not have the capacity and experience to monitor the *PFES Program*. [Figure 3.2](#) shows the flow of funds received by farmers who adopt management schemes designed to protect the forest in Da Bac district. Funds of *Program 661* were channeled through its provincial offices to three district management boards and community levels. The authorities involved in the implementation and monitoring that constitute the web of commands include: the Agroforestry Planning Department, Forestry Department, Forest Protection Department, Department of Agriculture and Rural Development, Department of Natural Resources and Environment, and the People's Committee at different levels. Needless to say, administrative and transaction costs escalate when more parties are involved. Reducing administrative and organizational costs, stemming from the

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heterogeneity and quantity of public authorities, will reduce the costs and enhance the financial sustainability of the *PFES Program*.

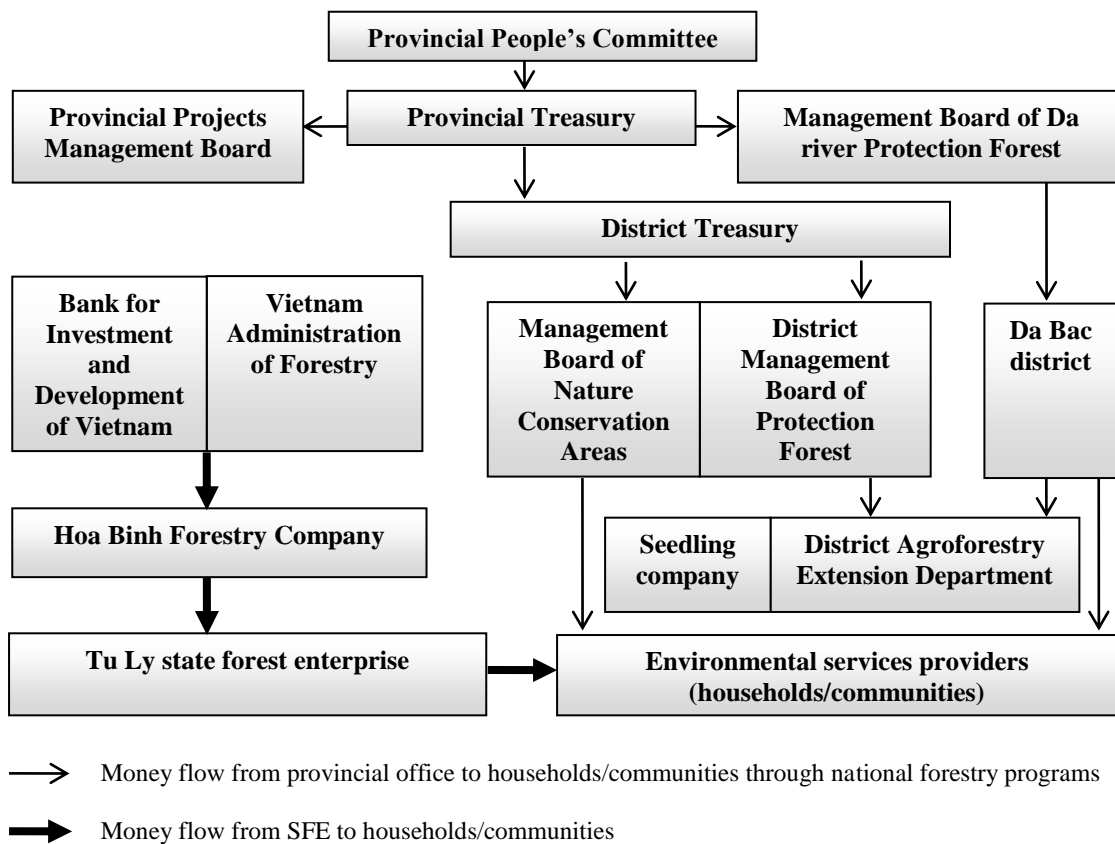


Figure 3.2: Money flow from the province to households and communities managing forest in Da Bac district, Hoa Binh province

Funds provided to households under Tu Ly SFE contracts follow a different channel (shown in [Figure 3.2](#)). The funds are discharged to Hoa Binh Forestry One Member Limited Company to Tu Ly SFE, and then to the households. No other authorities receive funds from the company. With fewer actors, and experienced staff, Tu Ly SFE’s administrative and operating costs are reduced. A comparison of Tu Ly SFE’s transactions with those of the Management Board of Da river Protection Forest in the district of *Program 661* reveals that Tu Ly SFE uses less staff in starting up and implementing the program ([Table 3.3](#)). Because Tu Ly SFE has a presence in the district, they disseminate information about forest programs, monitor forest activities, and conduct other activities easily. Provincial and district authorities in Hoa Binh acknowledge that SFEs can manage the forest better, and therefore should continue their role in the forest sector. Also, Tu Ly SFE propagates seedlings in their nursery, thereby avoiding the higher cost of out-sourcing.

Table 3.3: A comparison of some variables affecting transaction cost of managing Program 661 by Tu Ly SFE and the Protection Forest Management Board

Independent variables affecting transaction costs	Tu Ly SFE	Management Board of Da river Protection Forest
Number of communes served	9	11
Start-up variables		
Staff involved in implementation planning	4	10
Staff involved in program dissemination	3	2
Implementation variables		
Staff involved in monthly and annual meetings	7	10
Aggregated man-day spent on meetings	501	618
Staff involved in contract signing and disbursement	1	4
Staff involved in monitoring and enforcement	1	4

Source: Own data, key informant interviews in 2012

In the pilot studies in Vietnam, implementation of PFES was faster and more effective partly because forests were managed by SFEs (Suhardiman *et al.*, 2013). The PFES pilot study in Lam Dong province began working with SFEs in 2008. Local households with existing contracts (under *Program 327* and *Program 661*) were given PFES contracts. To date, 3,400 households have received payments for their services from SFEs. The successful model in Lam Dong can be attributed partly to working with the 13 state organizations (SFEs and PFMBs) that own and manage most of the forest land in the area. In contrast with Lam Dong, the Son La pilot study is directly involved with local households. Forest area had already been allocated to 50,000 forest owners in the early 2000s (Phuc *et al.*, 2012). The distribution of PFES had been slow and faced high transaction costs. The SFEs and PFMBs in Lam Dong prepared the necessary documents to support the contracts with households. In return, the SFEs and PFMBs were paid to administer the contracts.

3.4 MOVING FORWARD WITH SFEs

[Table 3.4](#) presents a strengths, weaknesses, opportunities, and threats (SWOT) analysis of SFE as environmental service providers and using them as intermediaries for monitoring activities in the *PFES Program*.

Table 3.4: SWOT analysis of SFEs as environmental service providers and as intermediaries for monitoring activities in the PFES Program

Strengths	Weaknesses
<ul style="list-style-type: none"> • Institutional framework based on business principles to be financially viable, but remain as agencies for forest protection under government regulations • Implementation of new guidelines are easily disseminated and enforced • Lower transaction cost due to: 	<ul style="list-style-type: none"> • Pressure to become financially independent drive SFEs to be more profitable, with less regard for forest protection. • Selectiveness of SFE contracts and employment, capturing local elites with connections to political power (Sikor and Tan, 2007; Phuc <i>et al.</i>, 2012)

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<ul style="list-style-type: none"> - Fewer parties involved in managing and monitoring their forestry programs - Many years of specialized experience in forest management - Greater autonomy and outreach in the district • Advantage of expertise and proximity • Experience in monitoring 	<ul style="list-style-type: none"> • Capital shortages and inadequate financing, due to high interest rates and stringent lending criteria imposed by banks
Opportunities	Threats
<ul style="list-style-type: none"> • Can create opportunities for local-level negotiations and choices regarding forest management contracts that accommodate local needs and livelihoods • Possibility of contracting SFE for monitoring forest activities other than their own land • The institutional arrangements of PFES in Vietnam already consider SFEs as an environmental service provider • Opportunity to secure funds for the sustainability of the company • Revenue from PFES is an interest-free capital for SFEs 	<ul style="list-style-type: none"> • Recurrence of the damaging SFE-era before the reform in 1991. • No clear directive from the government as to how the provinces distribute the funds.

Source: Own depiction

To improve the financial sustainability of SFEs, innovative partnerships with communities, rather than with many individuals, can reduce transaction costs (Adhikari and Lovett, 2006; Blore *et al.*, 2013). There are success stories of communal forest management in Vietnam, especially where the social composition is heterogeneous (Sikor and Tan, 2011). It is important to increase local participation in SFE programs to improve their financial sustainability and increase the benefits provided to local residents. This can be done through attractive terms and conditions of SFE contracts. With the potential of PFES as an interest-free capital source, SFEs can reduce interest rates on loans. The key to attracting poor farmers to participate is the identification of profitable activities. SFEs could work with households to develop alternative forms of agro-forestry for adoption in forested areas. Mono-culture needs to be reduced to avoid periods without revenue. Allowing mixed forest plantations in the PFES program, planting fruit trees with forest trees, and raising animals under forest canopies are examples of incentives for poor farmers to participate in forest management. The government could also encourage participation by studying the feasibility of in-kind payments in PES, such as the provision of materials, training and expertise.

3.5 CONCLUSIONS

With the devolution of the forest sector in Vietnam and the move towards a market-oriented economy, SFEs are facing financial constraints from the shortage of capital. The high interest rates and stringent lending criteria imposed by banks on SFEs have reduced the activities of SFEs and limited the

outreach of their forest programs. With the proposed role of SFEs as intermediaries in *PFES Program* activities, payments for the services could lift some of the financial burden.

Using SFEs as intermediaries for the *PFES Program* in Vietnam is not a novel idea. SFEs have carried out these responsibilities in past government programs. The recruitment of SFEs to monitor forest activities outside their forest lands is logical, given their expertise and experience in collaboration with local farmers. The system has been piloted with positive outcomes, but regulations must be revisited to provide concrete guidelines. The government must issue implementation guidelines to ensure wider outreach of the program to improve livelihoods. SFEs can achieve impacts by working with many poor households in forested areas.

The current discourse on transaction costs should consider the roles of institutional reform and organizational change in ensuring program success. An effective regulatory and monitoring framework is essential to avoid repeating historical problems with SFEs. To achieve wider distributed impact, regulations regarding the acceptable terms and conditions of SFE contracts are needed to encourage local participation. Considering additional livelihood options in the policies is important for poor farmers, due to the long recovery period of capital and gains. In doing so, forest protection and livelihood support can be addressed together. Although the study analysed only one SFE and a modest number of its contractors or employees (without the opportunity costs), it showed well the strengths and weaknesses of using SFEs as environmental service providers and intermediaries for monitoring activities in the *PFES Program*.

3.6 REFERENCES

- Adhikari, B., Lovett, J.C., 2006. Transaction costs and community-based natural resource management in Nepal. *Journal of Environmental Management* 78 (1), 5-15.
- Arias, M.E., Cochrane, T.A., Lawrence, K.S., Killeen, T.J., Farrell, T.A., 2011. Paying the forest for electricity: A modelling framework to market forest conservation as payment for ecosystem services benefiting hydropower generation. *Environmental Conservation* 38 (4), 473-484.
- Artemiev, I., 2003. State forestry enterprise reform in Vietnam: Unlocking the potential for commercial wood growing. Technical Note May 2003. World Bank. Washington D.C., USA.
- Bac, D.V., Catacutan, D.C., Ha, H.M., 2014. Importance of national policy and local interpretation in designing payment for forest environmental services scheme for the Ta Leng river basin in Northeast Vietnam. *Environment and Natural Resources Research* 4 (1), 39-53.
- Blore, M.L., Cundill, G., Mkhulisi, M., 2013. Towards measuring the transaction costs of co-management in Mkambati Nature Reserve, Eastern Cape, South Africa. *Journal of Environmental Management* 129 (15 November 2013), 444-455.

THE ROLE OF STATE FOREST ENTERPRISES IN THE PFES PROGRAM

- Bulte, E.H., Lipper, L., Stringer, R., Zilberman, D., 2008. Payments for ecosystem services and poverty reduction: Concepts, issues, and empirical perspectives. *Environment and Development Economics* 13 (3), 245-254.
- CIFOR, 2013. Rewarding the upland poor for environmental services: An innovative strategy to reward Asia's upland poor for preserving and improving our environment. World Agroforestry Center. Bogor, Indonesia.
- Clements, T., John, A., Nielsen, K., An, D., Tan, S., Milner-Gulland, E., 2010. Payments for biodiversity conservation in the context of weak institutions: Comparison of three programs from Cambodia. *Ecological Economics* 69 (6), 1283-1291.
- Coase, R.H., 1960. The problem of social cost. *Journal of Law and Economics* 3, 1-44.
- Dang, N.V., 2001. *Lâm nghiệp Việt Nam 1945-1950 (Vietnam forestry 1945-1950)*. Ha Noi Agriculture Publishing House. Ha Noi, Vietnam.
- de Jong, W., Sam, D.D., Hung, T.V., 2006. *Forest rehabilitation in Vietnam: Histories, realities and future*. Center for International Forestry Research. Bogor, Indonesia.
- Dunn, H., 2011. *Payments for ecosystem services. Evidence and analysis series*. Department for Environment, Food and Rural Affairs, London.
- EASRD, 2005. *State forest enterprise reform in Vietnam. Technical Note*. World Bank. Washington D.C., USA.
- Ecosystem Marketplace, 2008. *Payments for ecosystem services: Market profiles*. Forest Trends and Ecosystem Marketplace, Washington, DC, USA.
- Falconer, K., 2000. Farm-level constraints on agri-environmental scheme participation: A transactional perspective. *Journal of Rural Studies* 16 (3), 379-394.
- FAO, 2001. *Global forest resources assessment 2000: Main report*. FAO Forestry Paper No. 140. Rome. Italy.
- FAO, 2007. *The state of food and agriculture: Paying farmers for environmental services*. FAO Agricultural Series No. 38. Rome. Italy.
- FAO, 2009. *Vietnam forestry outlook study*. Working paper No. APFSOS II/WP/2009/09. Bangkok, Thailand.
- Gauvin, C., Uchida, E., Rozelle, S., Xu, J., Zhan, J., 2010. Cost-effectiveness of payments for ecosystem services with dual goals of environment and poverty alleviation. *Environmental Management* 45 (3), 488-501.
- Government of Vietnam, 1998. Decision No. 661/QĐ-TTg dated July 29, 1998 of the Prime Minister on objectives, tasks, policies and implementation arrangements for the Five Million Hectare Reforestation Program. Ha Noi, Vietnam.
- Government of Vietnam, 2010. Decree No. 99/2010/NĐ-CP dated September 24, 2010 of the Government on policy for payments for forest environmental services. Ha Noi, Vietnam.

THE ROLE OF STATE FOREST ENTERPRISES IN THE PFES PROGRAM

- Kile, G., Booth, T., Cromer, R., Marcar, N., Myers, B., Polglase, P., 1998. The role of plantations and farm forests in sustainable land management. En: Boosting International Competitiveness in the Australian Timber and Forestry Industry. AIC Conference, Sydney.
- Kronenberg, J., Hubacek, K., 2013. Could payments for ecosystem services create an “ecosystem service curse”. *Ecology and Society* 18 (1), 10.
- Landell-Mills, N., Porras, I.T., 2002. Silver bullet or fools' gold?: A global review of markets for forest environmental services and their impact on the poor. International Institute for Environment and Development. London, UK.
- Liss, B.-M., 2008. Development and application of a pilot policy on payment for environmental services (PES) in Da river basin, Son La province. Consultant report to the Vietnamese-German forestry programme, International consultancy services, Landsberg/Lech, Germany.
- Litzenberg, I., 2013. Vietnam forest protection and development fund. Paper presented at the regional workshop on ‘Challenges in benefit sharing and livelihood improvement with water storage development’, March 20-21, 2014., Vientiane, Lao PDR.
- MARD, 2012. Forest sector development report 2011: Serving FSSP annual plenary meeting, 1 March 2012. Ha Noi, Vietnam.
- Mayrand, K., Paquin, M., 2004. Payments for environmental services: A survey and assessment of current schemes. Unisfera International Centre. Montreal, Canada. 52p.
- McElwee, P., 2009. Reforesting “bare hills” in Vietnam: Social and environmental consequences of the 5 million hectare reforestation program. *Ambio: A Journal of the Human Environment* 38 (6), 325-333.
- Mettepenningen, E., Verspecht, A., van Huylenbroeck, G., 2009. Measuring private transaction costs of European agri-environmental schemes. *Journal of Environmental Planning and Management* 52 (5), 649-667.
- Milder, J.C., Scherr, S.J., Bracer, C., 2010. Trends and future potential of payment for ecosystem services to alleviate rural poverty in developing countries. *Ecology and Society* 15 (2), 4.
- Nambiar, E.S., 1999. Productivity and sustainability of plantation forests. *Bosque* 20 (1), 9-21.
- Nga, D.T., 2014b. Thực hiện chính sách chi trả dịch vụ môi trường rừng: Thực tiễn và thách thức tại Quảng Nam, Nghệ An, Thanh Hóa (Payments for forest environmental services: Practice and challenges in Quang Nam, Nghe An, and Thanh Hoa). Paper presented during the Stakeholder workshop on benefit sharing and payments for environmental services, 10-11, March 2014. Ha Noi, Vietnam.
- Nguyen, T.T., Bauer, S., Uibrig, H., 2010. Land privatization and afforestation incentive of rural farms in the Northern Uplands of Vietnam. *Forest Policy and Economics* 12 (7), 518-526.
- Nguyen, T.T., Koellner, T., Le, Q.B., Lambini, C.K., Choi, I., Shin, H.-j., 2014. An economic analysis of reforestation with a native tree species: The case of Vietnamese farmers. *Biodiversity and Conservation* 23 (4), 811-830.

THE ROLE OF STATE FOREST ENTERPRISES IN THE PFES PROGRAM

- Nguyen, T.T., Pham, V.D., Tenhunen, J., 2013. Linking regional land use and payments for forest hydrological services: A case study of Hoa Binh Reservoir in Vietnam. *Land Use Policy* 33 (July 2013), 130-140.
- Pagiola, S., Arcenas, A., Platais, G., 2005. Can payments for environmental services help reduce poverty? An exploration of the issues and the evidence to date from Latin America. *World Development* 33 (2), 237-253.
- Phuc, T.X., Dressler, W.H., Mahanty, S., Thuy, P.T., Zingerli, C., 2012. The prospects for payment for ecosystem services (PES) in Vietnam: A look at three payment schemes. *Human Ecology* 40 (2), 237-249.
- Qi, S., 2014. Research on the legal system of payment for ecosystem services under the global perspective. *Canadian Social Science* 10 (2), 108-112.
- Šálek, L., Sloup, R., 2012. Economic evaluation of proposed pure and mixed stands in Central Vietnam highlands. *Journal of Agriculture and Rural Development in the Tropics and Subtropics* 113 (1), 21-29.
- Šálek, L., Výlupek, O., 2012. Contribution to the restoration of mixed forests in Central Vietnam. *Journal of Sustainable Forestry* 31 (6), 549-562.
- Scherr, S.J., Bennett, M.T., 2011. Buyer, regulator, and enabler - The government's role in ecosystem services markets: International lessons learned for payments for ecological services in the People's Republic of China. Asian Development Bank. Mandaluyong city, Philippines.
- Scherr, S.J., Michael T. Bennett, Molly Loughney, Canby, K., 2006. Developing future ecosystem service payments in China: Lessons learned from international experience. *Forest Trends*. Washington, D.C., USA.
- Sikor, T., 1998. Forest policy reform: From state to household forestry. In: *Stewards of Vietnam's upland forests*. Asia Forest Network, Berkeley, pp. 18-38.
- Sikor, T., Tan, N.Q., 2007. Why may forest devolution not benefit the rural poor? Forest entitlements in Vietnam's central highlands. *World Development* 35 (11), 2010-2025.
- Sikor, T., Tan, N.Q., 2011. Realizing forest rights in Vietnam: Addressing issues in community forest management. The Center for People and Forests (RECOFTC). Bangkok, Thailand.
- Sommerville, M.M., Milner-Gulland, E., Jones, J.P., 2011. The challenge of monitoring biodiversity in payment for environmental service interventions. *Biological Conservation* 144 (12), 2832-2841.
- Suhardiman, D., Wichelns, D., Lestrelin, G., Hoanh, C.T., 2013. Payments for ecosystem services in Vietnam: Market-based incentives or state control of resources? *Ecosystem Services* 6 (September 2013), 64-71.
- Tallis, H., Kareiva, P., Marvier, M., Chang, A., 2008. An ecosystem services framework to support both practical conservation and economic development. *Proceedings of the National Academy of Sciences*, pp. 9457-9464.

THE ROLE OF STATE FOREST ENTERPRISES IN THE PFES PROGRAM

- Tan, N.Q., 2011. Payment for environmental services in Vietnam: An analysis of the pilot project in Lam Dong province. Institute for Global Environmental Strategies (IGES). Hayama, Japan.
- Tan, N.Q., Ngai, N.B., Thanh, T.N., Sunderlin, W., Yasmi, Y., 2008. Forest tenure reform in Vietnam: Case studies from the Northern Upland and Central Highlands regions. The Center for People and Forests (RECOFTC), Bangkok, Thailand and The Rights and Resources Initiative (RRI), Washington D.C, USA. Unpublished Draft Report.
- Thuy, P.T., Bennett, K., Phuong, V.T., Brunner, J., Dung, L.N., Tien, N.D., 2013. Payments for forest environmental services in Vietnam: From policy to practice. Occasional Paper 93. Center for International Forestry Research. Bogor, Indonesia.
- Todorova, M., Martini, M.L., I., Grigorova, Y., J., T., 2013. Promoting payments for ecosystem services and related sustainable financing schemes in the Danube Basin. WWF, Switzerland.
- VNFF, 2013. Proceedings workshop on payment for forest environmental services in Vietnam - Status and solutions. Ha Noi, Vietnam.
- Wunder, S., 2008. Payments for environmental services and the poor: Concepts and preliminary evidence. *Environment and Development Economics* 13 (3), 279-297.
- Zhu, X., Møller, L.R., De Lopez, T.T., Zaballa Romero, M.E., 2010. Pathways for implementing REDD+: Experiences from carbon markets and communities. Danmarks Tekniske Universitet, Risø Nationallaboratoriet for Bæredygtig Energi.
- Zilberman, D., Lipper, L., McCarthy, N., 2008. When could payments for environmental services benefit the poor? *Environment and Development Economics* 13 (3), 255-278.

CHAPTER 4

PAYMENTS FOR FOREST ENVIRONMENTAL SERVICES IN VIETNAM: AN INSTITUTIONAL ANALYSIS BASED ON A CASE STUDY IN HOA BINH PROVINCE

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Abstract

The aim of the study is to examine the institutional design, performance, and interplay of the *Payments for Forest Environmental Services Program (PFES Program)* in Vietnam. Data were collected from 138 in-depth interviews and nine focus group discussions in March and April of 2014 in Da Bac district, Hoa Binh province. This study adds to the limited number of empirical studies on the institutional analysis of payment for environmental services (PES) scheme and on empirical lessons from PES implementation. The central government operates in a top-down fashion throughout several governance levels when implementing the *PFES Program*. Incomplete design and shortcomings at the central-level result in poorer performance at lower levels. There are no specific objectives or targets of the *PFES Program* at the central and provincial levels. The lack of strategic management makes it difficult to know whether the program's objectives are achieved. Participating households act as forest guards rather than forest owners. There is additionality in both planted and natural forests, but greater additionality in natural forests may be threatened in the near future unless there is a good monitoring and benefit sharing mechanism in place. Benefits resulting from the program include economic gains, a growing awareness of environmental values, and a greater commitment to forest conservation. However, the program's results in several negative consequences, such as the lack of agricultural land, discouragement of livestock development, and complaints and disputes among farmers. The *PFES Program* mainly complements other institutions at the national- and local-levels. Although incompatibilities exist in terms of customary practices, it is unlikely that these will develop into an institutional conflict.

4.1 INTRODUCTION

Payment for environmental services (also known as payments for ecosystem services or PES) has recently received great attention in both developed and developing countries. PES is considered an approach which can promote forest conservation and can also support the economic development of the rural population (Wertz-Kanounnikoff and Rankine, 2008; Corbera *et al.*, 2009; Bac *et al.*, 2014). This despite the wide variation among many types of PES schemes (Wunder, 2005) and different advocate groups (e.g., ecologists, biologists, economists, and development practitioners) that promote it (McElwee, 2012).

The definition of PES introduced by Wunder (2005) is commonly used and has since become a theoretical concept (Vatn, 2010). Wunder revised his 2005 definition that was criticized as being so narrow that few real-world interventions could fully satisfy its five criteria and as being too market-based (Porras *et al.*, 2008; Muradian *et al.*, 2010; Vatn, 2010). PES is newly defined as “voluntary transactions between service users and service providers that are conditional on agreed rules of natural resource management for generating offsite services” (Wunder, 2015, p.8). This new definition recognizes that most agreements are constructed around resource-use proxies rather than well-defined environmental services (Vatn, 2010). The definition also avoids using the terms “buyer” and “seller”, which have been criticized for giving a direct association with markets (Muradian *et al.*, 2010). Analyses on how PES operate have shown that most schemes are rarely fully voluntary (Muradian *et al.*, 2008; Vatn *et al.*, 2011) or conditional on verified additional provisions of ecosystem services (Naeem *et al.*, 2015), whereas these features remain in Wunder’s new definition.

Institutionalist scholars have recently proposed alternative conceptual approaches in which PES only works under certain complex environmental, socio-political, and economic conditions (Porras *et al.*, 2008; Sommerville *et al.*, 2009; Muradian *et al.*, 2010). Among them, Muradian *et al.* (2010) focus on the context of implementation of PES to explain the gap between the ideal type of PES and their practical implementation. Accordingly, PES is defined as “a transfer of resources between social actors, which aims to create incentives to align individual and/or collective land use decisions with social interest in the management of natural resources” (Muradian *et al.*, 2010, p.1248). This approach is far more in line with ecological economics, in which ecological sustainability and just distribution take precedence over market efficiency in furthering social interests (Farley and Costanza, 2010).

The current PES literature distinguishes between user- and government-financed schemes to determine the immediate payer and, more importantly, who has the authority to make decisions over PES payments (Engel *et al.*, 2008), which is determined by the roles and responsibilities of relevant

actors, the institutional context, and the process of PES design (Engel *et al.*, 2008; Corbera *et al.*, 2009; Sommerville *et al.*, 2009).

The literature has shown that the majority of PES schemes operating at present (e.g., PES programs in Costa Rica, Mexico, Ecuador, China, and Vietnam, as well as agro-environmental payments from the U.S. and Europe) is run by states under a public policy regulation framework (Gómez-Baggethun and Muradian, 2015). PES' funds are primarily collected from taxes and fees imposed by public authorities and the level of payments is politically set, which results from negotiations with concerned stakeholders or is calculated based on opportunity costs (*ibid.*).

Despite the number of studies on the definition of PES and the steady increase over the last decade in the quantification and valuation of environmental services (e.g., Corbera *et al.*, 2007; Muradian *et al.*, 2010; Vatn, 2010), in-depth research on the institutional processes that mediate the provision of environmental services through compensation mechanisms has only recently started to emerge (Corbera *et al.*, 2009).

Prokofieva and Gorriz (2013) have shown diversity in existing private, public, and hybrid public-private initiatives in Spain. In a Land Stewardship (LS) scheme (i.e., a private scheme), the terms are fully negotiable between private forest owners and the LS entities. As a result, the LS scheme functions in the absence of strong economic incentives since it considers the interests of all stakeholders and the existence of local social networks in addition to there being a public recognition of landowners' roles. Forest Defence Groups (i.e., a hybrid scheme) have emerged as a solution to conflicts between private forest owners and firemen over the right to intervene in fire extinction activities on private forest land. The limited awareness among forest owners is caused by conflicting opinions of some actors in the Mature Forest Reserves scheme (i.e., a public scheme) (*ibid.*).

From the perspective of institutional environmental performance, Costa Rica's PES program (PESP) produces low additionality¹¹ for PESP-Protection and average additionality for PESP-Reforestation (Legrand *et al.*, 2013). This PESP favors agricultural abandonment and institutional changes in the forest sector by reinforcing environmental awareness, making it possible to prohibit changes in the use of forest land and supporting modernization of governance of the forest sector. On the other hand, PESP's social performance is poor, as the program has not achieved its objective of establishing a financial system based on contributions from ES users; however, PESP appears to be sustainable since it is widely recognized as legitimate and has been effective in securing public funds (*ibid.*).

Corbera *et al.* (2009) proposed a multi-dimensional framework for examining the development and effectiveness of PES schemes, based on institutional design, performance, and interplay. Institutional

¹¹ Additionality means that the extent to which the forest land uses promoted by the PESP would not have been adopted anyway in its absence.

design “implies an understanding of why PES is proposed as a policy tool in a particular context and which actors shape the rule-design process”, institutional performance “is an assessment of how PES achieve their stated objectives”, and institutional interplay “concerns how a set of institutions affect one another”. Subsequently, Corbera *et al.* (2009, p.745-746) write, “One should ask whether PES influence or are impacted by other institutions, as well as which type of synergies or conflicts across institutional arrangements exist”. The application of this framework to carbon forestry program reveals that the program’s procedural rules have changed over time to adapt to public funding constraints, to assure the commitment of beneficiaries to implementing the program over time, and to satisfy international regulations and reduce management costs. Sources of interplay include local property rights, which result in low transaction costs, and international guidelines for carbon forestry activities (*ibid.*).

In Vietnam, high-level commitment from the government to enhance forest protection and development is expressed through its continuous implementation of national forestry programs since the 1990s. These programs include the Greening the Barren Hills Program from 1993 to 1998 (known as *Program 327*), the Five Million Hectare Reforestation Program from 1998 to 2010 (known as *Program 661*) (Huong *et al.*, 2014), and the Protection and Development Plan from 2011 to 2020 (hereafter, *Plan 57*). These programs are timely for the further development of PES policies in Vietnam. In addition, they also operationalize the PES concept in the region (Wertz-Kanounnikoff and Rankine, 2008) since Vietnam is the first country in Southeast Asia to have a national law on PES (McElwee, 2012; Thuy *et al.*, 2013). *Payments for Forest Environmental Services*¹² begun with a pilot scheme in a southern province (Lam Dong) and a northern province (Son La) in Vietnam in 2008 before its official implementation countrywide in 2011 through the promulgation of the *Government Decree 99* in 2010 (Government of Vietnam, 2010). The decree stipulates that environmental services resulting from forest owners’ efforts in the protection and plantation of forests must be rewarded.

By adopting an analytical approach proposed by Corbera *et al.* (2009) and North’s (1990) concept of institutions as the “rules of the game”, this study seeks to gain an understanding how PFES can be applied in the forest sector in Vietnam and a better understanding of questions related to the institutional design, performance, and interplay of PFES schemes. Specifically, this paper aims to address the following three objectives. First, to explore reasons for the emergence of PFES in Vietnam and the program’s features at the central and provincial levels; second, to examine the performance, sustainability, and management of the program; and third, to shed light on complementary and conflictual connections between PFES and other formal and informal institutions at different levels of governance and across sectors. In this regard, this study adds to the limited empirical evidence on the institutional analysis of PES schemes (e.g. Corbera *et al.*, 2009; Legrand *et*

¹² In the literature, PES is used; however, in Vietnam, the term “forest” is included given the importance of forests for environmental services in the country.

al., 2013; Prokofieva and Gorriz, 2013) and on empirical lessons from PES implementation in the field.

In [Section 4.2](#), we describe the case study area, sample size, and methodology of data collection and analysis; [Section 4.3](#) analyzes three institutional dimensions, namely the design, performance, and interplay of the *PFES Program*; [Section 4.4](#) contains the discussion of results; and [Section 4.5](#) states conclusions.

4.2 STUDY AREA AND METHODOLOGY

4.2.1 Study area

Da Bac, an upland district in Hoa Binh province, was selected as the site for the fieldwork. The district is about 20 km northwest of Hoa Binh city and about 92 km northwest from Vietnam's capital, Ha Noi. In total, forest land accounts for 83.6% of the district's total land area (Da Bac District Department of Agriculture and Rural Development, 2011). The district can be classified into three social-ecological regions. Region 1, in the eastern part of the district and close to the main town in Da Bac district (Da Bac town), is focused on traditional agriculture production, animal husbandry, handicraft production, and the provision of services. Meanwhile, Regions 2 and 3 specialize in the planting and protection of forests, as well as the planting and management of fruit and industrial trees. Region 2 also has potential for aquaculture, as it is located near the Hoa Binh reservoir. Region 3, which is characterized by steep hills and mountains, is suitable for diversified and large-scale agro-forestry production (*ibid.*).

In Hoa Binh, the currently implemented *PFES Program* is within the watershed of the Hoa Binh hydropower plant. The program's coverage area consists of Hoa Binh city and 56 communes in four of Hoa Binh province's ten districts. Nine of the 56 communes are ineligible for the *PFES Program* because the forest areas in those communes are too small, which could lead to high transaction costs for implementing agencies. Within the 45 communes eligible for the program, 18 are in Da Bac district. Three of these communes were chosen to represent each of the three socio-ecological regions in the district. One village was then randomly selected from each commune, each reflecting the presence of PFES and social-ecological diversity in Da Bac district. To protect identities of the actual villages, the selected villages are referred to as Co1, Da1, and Da2 (Meshack *et al.*, 2006). In each village, 40 households were randomly chosen for individual in-depth interviews. Moreover, within each village 18-20 households were randomly selected and then classified into three focus group discussions: one included members of the Village Forest Guard Group (hereafter VFGG), another of poor households, and another of non-poor households.

The fieldwork was conducted in March and April of 2014. In total, 138 in-depth interviews with 141 respondents and nine focus group discussions with 59 respondents (each group contained six to eight

participants) were held. These interviews involved different types of actors that participated in the design and implementation of PFES at the provincial-level, including intermediaries, services users, and service providers. Furthermore, we interviewed an official from Winrock International, an organization that contributed to the development of PFES in Vietnam and that was involved in the design process of the program at the central-level during its early stage. We asked key informants three sets of research questions. The first set of questions addresses the motivation behind implementing PFES and the legal policy framework. The second set of questions is concerned with the specific activities in the implementation of PFES, monitoring and evaluation of the PFES contract, consequences resulting from the program's implementation, and the management and sustainability of the program. The third group of questions relates to existing policies and/or policy instruments at different levels of governance and across various sectors, and informal institutions in terms of whether they are complementary or adversarial to the design and implementation of PFES.

Three main research hypotheses are examined in this study. The first hypothesis is that the emergence of PFES was motivated to address the shortage of the government's budget invested in forest protection and other degraded environments, with the central government being able to maintain control on natural resources. The second hypothesis is that the characteristics of the design of this government-led scheme resulted in a relatively poor institutional performance on the ground. The third hypothesis is that complementary – not conflicting – interactions between PFES and other institutions occurred within the same levels of governance, as well as across different levels of governance and sectors.

4.2.2 Data collection and analysis

To develop our study, we rely on an extensive review of the literature and archival documents, such as internal reports, external reports, and official documents that include manuals of procedure, national decrees, and other executive documents. The literature enables us to uncover the drivers of the emergence of PFES in Vietnam, its design process, and the actors involved in as well as their impact on designing the program's rules at the central-level. An interview with the representative of Winrock International helped complement the literature regarding the initial development of PFES. We interviewed state body intermediaries at different levels of governance to obtain information on the implementation process, the stakeholders involved and their roles in implementing the program, the collection and disbursement of PFES payments, and the current and potential challenges faced by implementing agencies. Individual and group interviews at the household-level enable us to capture the perception of farmers about the program, benefits from participating in the program, and consequences from the program's implementation, as well as their actual performance on forest protection measures. Finally, interviews with representatives from hydropower plants were conducted

to understand their perceptions of the program and their exchange of information with other actors, notably the provincial forest protection and development fund.

Interviews were conducted during the data collection phase and were transcribed word-for-word. Each transcription was coded using predefined nodes, i.e., nodes determined by the researcher before the fieldwork, and new nodes for information that emerged during the fieldwork and coding. Nodes were then grouped under broad categories. The coding process was aided by the computer program NVIVO 10. Notes taken during the survey were integrated with respondents' direct quotes during the final analysis stage.

4.3 RESULTS

4.3.1 Description of the watershed of Hoa Binh hydropower plant and the selected villages

Historically, Da Bac is one of the most affected districts from the construction of the second largest dam in Vietnam. The construction of the Hoa Binh hydropower plant's dam began in 1979 and led to the resettlement of 9,214 households with 55,772 people in 25 communes in the province, of which 16 communes were located in Da Bac district (Hoa Binh Provincial Union of Science and Technology Associations, 2010). Since then, the resettlement region has been given numerous national policies across various sectors that have aimed to ensure stable accommodation and an improvement in living standards. The most notable project is the on-going *Stabilizing Settlement and Social-economic Development in the Resettlement Region along the Da River in Hoa Binh province*, which began in 1995. Despite these programs, resettled people have suffered from poor infrastructure, a low-level of education, few opportunities for off-farm jobs, and a lack of cultivated land since thousands of hectares were inundated (Hoa Binh Provincial Union of Science and Technology Associations, 2010). A Management Board of Da River Protection Forest (hereafter, MB2) was established to be responsible for government's management of the forests in the region, apart from the general government's administration of Hoa Binh Provincial Department of Agriculture and Rural Development (DARD).

The three selected villages have a high percentage of forest land (84.1% of the villages' total land area) and a small proportion of agricultural land (11.3%) and paddy rice land (0.9%). Notably, Da1 village suffered from the loss of all of its 30 hectares (ha) of paddy rice due to the construction of the Hoa Binh reservoir. As a consequence, farmers began renting land in neighboring communes (e.g., Hien Luong commune) in 2005, as a means to partially address the lack of agricultural land.

To summarize, the watershed and villages have a lack of agricultural land, disadvantageous socio-economic conditions, and a separated management board. The continuous presence of subsidy programs for forest protection could result in advantages and disadvantages for the implementation of PFES on the ground.

4.3.2 Institutional design

4.3.2.1 Drivers for the development of PFES and actors involved

Drivers for emerging PFES in Vietnam consist of the political interest of the central government for socializing the forestry sector, the shortage of the government's budget for forest protection and management, deforestation and environment degradation, and timely international support.

Forest governance reform through the transformation from a traditional approach primarily based on exploitation of natural forests by the state for the socialization of forestry¹³ is highlighted by the nationwide implementation of forest land allocation which began in 1994 (Government of Vietnam, 1994). Despite its slow progress (Government of Vietnam, 2007), it was further strengthened in *Vietnam Forestry Development Strategy 2006-2020*.¹⁴ Accordingly, resources should be diversified in which non-state funds, namely, private, official development assistance (ODA), foreign direct investment (FDI), and other sources generated from environmental services, are expected to sustain forest protection and development (Government of Vietnam, 2007; Peters, 2008; Thuy *et al.*, 2012). The establishment of the Forest Protection and Development Fund (hereafter, FPDF) system at the central- and provincial-levels (Vietnam National Assembly, 2004; Government of Vietnam, 2008b) is a state financial institution to mobilize social resources for forest protection and development¹⁵ and to manage the PFES budget which consists of fees collected from service users (ADB, 2014).

Historically, the government has spent a large amount of the government's budget on forest protection and management through forestry programs nationwide, such as *Program 327*, *Program 661* (Wertz-Kanounnikoff and Rankine, 2008), and currently *Plan 57* (Government of Vietnam, 2012a); however, government funding still falls short of the programs' requirements (Winrock International, 2011; Thuy *et al.*, 2012). As of 2011, the demand for government funding was 1,897.9 billion VND (equivalent to US\$ 85.9 million in 2010)¹⁶, but the central budget only planned to fund 750 billion

¹³ Socialized forestry means that multiple stakeholders (e.g., individuals, organizations) can utilize forest resources, instead of the state. For example, households are allocated, and non-state enterprises are leased forest land for long-term use. Accordingly, these stakeholders are responsible for forest protection and development.

¹⁴ Section 1, Part 3, Article 4 of *Vietnam Forestry Development Strategy 2006-2020* stipulates: "The socialization of forestry should continue to be implemented and made more profound. Multiple stakeholders should be encouraged in the utilization of forest resources (including special-use and protection forests), as well as multiple ownership for the management and use of production forests and forest products processing entities. The form of shareholding will be applied gradually and widely to the forestry production units. The processing units shall be linked with raw material supply areas."

¹⁵ As stipulated in Section 3, Article 11 of *Forest Protection and Development Law 2004*: "The Forest Protection and Development Funds are formed from the sources of financial supports of domestic organizations, households and individuals, foreign organizations and individuals as well as international organizations; contributions of domestic organizations, households and individuals as well as foreign organizations and individuals that exploit or use forests, process, purchase, sell, import and/or export forest products, benefits from forests or directly affect forests; and other revenue sources prescribed by law."

¹⁶ All monetary data in this chapter have been converted to 2010 Vietnam dong (VND) using Vietnam's Consumer Price Index (CPI) as inflator and then to 2010 US dollars using the World Bank's exchange rate (<http://data.worldbank.org/>). In 2010, US\$ 1 equaled 18,612.92 VND.

VND (US\$ 34.0 million), equivalent to 39% of the amount demanded. The government's investment in forestry was reduced by about half (52.6%) in comparison to the previous year (MARD, 2012c). The insufficiency of funds is also apparent through the finding that effective forest protection activities would cost 346,185 VND (US\$ 26.7) per ha per year in Yok Don National Park (Hoai, 2010 cited in Thuy *et al.*, 2012), yet the government budget allocated 100,000 VND (US\$ 7.7) per ha per year in 2007 (Thuy *et al.*, 2012). In addition, in a study on pilot PFES in the Dong Nai river basin, Peters (2008) pointed out that the investment level from the government was 26-27% of the expected forest management needs.

Vietnam has suffered from the loss of critical forest lands, deforestation, and other environmental degradation (Winrock International, 2011; McElwee, 2012; ADB, 2014). The main direct causes of deforestation are: land conversion for agriculture (mainly food crops, higher-value commercial and perennial crops, shrimp and other aquaculture production); land conversion for infrastructure (especially, hydropower installations); unsustainable legal and illegal logging; and forest fires (Thuy *et al.*, 2012). The main indirect drivers of deforestation are: the growing demand for forest products and agricultural land driven by population growth and migration; and the increasing demand for wood for the paper industry, construction, and fuel (Sunderlin and Ba, 2005 cited in Thuy *et al.*, 2012). One of the most pressing issues for conservation involves offsetting opportunity costs to rural communities for protecting natural habitats rather than converting them to agriculture or other uses providing immediate income generation. For example, in Son La province, one hectare of cultivated corn results in an average income of 15 million VND per year (US\$ 622.5) (Phuc *et al.*, 2012). Compared to the low government subsidy for forest protection, the cultivation of corn is an attractive option for farmers and can be seen as a key modifier of the landscape and environmental functions in Son La province. In addition, biodiversity and watershed conservation services provided by special-use forests, protection forests, and commercial forests are often undervalued (Government of Vietnam, 2007; Winrock International, 2011; Thuy *et al.*, 2013). The concern for hydropower plants in paying local communities for forest protection, in fact, has been taken into consideration since the late 1980s when Hoa Binh hydropower plant began operating (Tan, 2011). The interest in payment for forest conservation picked up again in the early-mid 2000s when natural calamities, such as flood and mudslides, resulted in the loss of human lives and assets of farmers (Tan, 2011; Ly, 2013).

Before 2005, the World Agroforestry Center (ICRAF) implemented the project *Rewarding the Upland Poor for Environmental Services (RUPES)* funded by the International Fund for Agricultural Development (IFAD). This project laid the foundation for connecting poor upland communities in forest areas to downstream water users. The project's findings in several Asia countries was applied to a project in Vietnam to examine whether PES could function in Vietnam (The *et al.*, 2004; The and Ngoc, 2008 cited in McElwee, 2012). After implementing the RUPES project, several pilot PES

projects were carried out, including projects aimed at protecting landscape beauty and, watersheds, and carbon sequestration (see more in Thuy *et al.*, 2013).

Since 2005, Winrock International has implemented the *Asia Regional Biodiversity Conservation Program* (ARBCP) funded by the United States Agency for International Development (USAID) (Tan, 2011; Winrock International, 2011; McElwee, 2012; Ly, 2013). The ARBCP undertook research on consolidating pilot biodiversity conservation, payment for environmental services, and livelihoods activities in Lam Dong province in southern Vietnam (Tan, 2011; McElwee, 2012; Nga, 2014a). In 2007, the ARBCP promoted PES by organizing workshops to present findings and introduce PES projects in other countries, particularly in the United States, to key decision makers within Vietnam's Ministry of Agriculture and Rural Development (MARD), and by sponsoring a visit of PES models in the United State (McElwee, 2012). These lobbying efforts resulted in a policy that was approved under the Prime Minister's Decision No. 380 in 2008. This policy piloted payments for forest environmental services and its implementation was led by the MARD (McElwee, 2012; Phuc *et al.*, 2012). The ARBCP was selected to undertake implementation in Lam Dong, while the German Agency for International Cooperation (GIZ) supported similar activities in Son La (Tan, 2011; Winrock International, 2011; McElwee, 2012; Nga, 2014a) where the GIZ had a long-standing donor project on land allocation (McElwee, 2012).

Despite the considerable achievements in the two-year pilot PFES projects in Lam Dong province (ADB, 2014; Bac *et al.*, 2014; Nga, 2014a), there were unexpected delays in the distribution of PES payments in Son La, which were mainly due to the complexity of local tenure arrangements (Phuc *et al.*, 2012). At the same time, the MARD reported to the Prime Minister that forest inventories for areas holding PES potential in Son La province could be completed within five years; however, this seemed impossible given the difficulties in the province (Phuc *et al.*, 2012). As such, these efforts received great interest from the central government, which subsequently continually instructed the MARD to lead the preparation of *Government Decree 99* (ADB, 2014; Bac *et al.*, 2014; Nga, 2014a). *Government Decree 99*, which passed in September of 2010, eventually became the overarching policy and legal framework for the development of the *PFES Program* throughout Vietnam.

Additionally, NGOs and donors were also strongly supportive of integrating PES into a national *Biodiversity Law* (McElwee, 2012) which led to an official recognition of PES as stipulated in Article 74 of the *Biodiversity Law 2008* that "Organizations and individuals using environmental services related to biodiversity shall pay charges to service providers" (Vietnam National Assembly, 2008). According to some researchers, this achievement would create opportunities for many other PES projects in different fields (e.g., pollution management, carbon sequestration, and tourism) and land areas (e.g., wetlands and marine areas), and would be implemented by different state-bodies (e.g., the Ministry of Natural Resources and Environment (MONRE) (McElwee, 2012).

Although international NGOs provided important financial and technical support for the development of PES and other PES-related initiatives in Vietnam (Wertz-Kanounnikoff and Rankine, 2008; McElwee, 2012)¹⁷ – of which Winrock International and the GIZ were the most prominent (Catacutan *et al.*, 2011; Winrock International, 2011; Phuc *et al.*, 2012; Ly, 2013; Nga, 2014a) – final decisions were made by the MARD, which was the country’s focal point on PFES (Winrock International, 2011). In general, it is necessary to consider the socioeconomic and socio-political factors, particularly in the context of Vietnam, rather than using scientific basis alone. For example, in a 2008 study, Winrock International found out that production costs of water regulation and soil conservation were 64.55 VND (US 0.404 cents) per kilowatt hour of electricity produced, of which 14.9 VND (US 0.093 cents) were for the cost of water regulation and 49.6 VND (US 0.311 cents) were for the cost of sediment reduction in the reservoir (Winrock International, 2011). Based on these findings, Winrock International proposed a charge of about 100 VND (US 0.626 cents) per kilowatt hour to hydropower plants (Nga, 2014a), but the MARD set the payment level at 20 VND (US 0.125 cents) per kilowatt hour for commercial hydropower production businesses and 40 VND (US 0.250 cents) per cubic meter for clean water production businesses (Government of Vietnam, 2008a). The payment level was adjusted and set to comply with political and social considerations.

Regarding landscape services for beautification, to the best of our knowledge based on an extensive literature review, the team drafting *Decision 380* failed to identify a fee for tourist businesses (Phuc *et al.*, 2012). Consultation with different stakeholders and tourist operators about their willingness to pay has helped the team identify that such businesses are willing to pay 0.5-2% of their annual revenue for such a fee (*ibid.*). Moreover, the term PFES (which again, stands for Payments for Forest Environmental Services) used in the policy paper is affected by the interests of the MARD. The term “forest” within PFES is important since forests in Vietnam are seen as critical for changing environmental policies as they are the origin of environmental services, such as watershed protection (Wertz-Kanounnikoff and Rankine, 2008). Nevertheless, it likely to be more important for PFES policy design that forests resources be managed by the MARD, which has been playing a critical role in PFES policy design and implementation (Nga, 2014a).¹⁸

¹⁷ Work on the PES policy has been supported through the Asian Regional Biodiversity Conservation Programme, funded by USAID and implemented by Winrock International and IUCN. Other organizations active supporting PES in Vietnam include the WWF and the World Agroforestry Organization and the Asian Development Bank (Wertz-Kanounnikoff and Rankine, 2008).

¹⁸ Although the term of payments for environmental services was integrated into the draft of the Law of Biodiversity in 2006 and officially recognized in the Law of Biodiversity in 2008 prepared by the MONRE, the MARD was assigned to implement Decision 380 on piloting PFES since the MARD manages forest resources. In addition, Winrock International was working with the MARD, not the MONRE.

4.3.2.2 Features of PFES

The objectives of PFES policy are not specified in any policy paper in Vietnam. Instead, they are in the literature. According to the Vietnam Forest Protection and Development Fund (VNFF) (2014a), PFES policy aims to: (1) improve forest quality and quantity; (2) increase the forestry sector's contribution to the national economy; (3) reduce the state's financial burden for forest protection and management; and (4) improve social well-being. It is argued that establishing clear objectives that reflect the development context are important for the sustainability of PES schemes, particularly national PES policies as such objectives can inform the design of PES schemes (Wertz-Kanounnikoff and Rankine, 2008). The specific targets of PFES in Vietnam, however, remain unclear.

The PFES policy identifies four types of forest environmental services. These are: (i) watershed protection (including soil protection, the reduction of erosion, watershed protection, the regulation and maintenance of water sources, and the reduction of sedimentation of reservoirs, rivers and streams); (ii) natural landscape beauty protection and biodiversity conservation for tourism; (iii) forest carbon sequestration and the reduction of greenhouse gas emissions through the prevention of deforestation and forest degradation; and (iv) the provision of the forest hydrological services for spawning in coastal fisheries and aquaculture (Government of Vietnam, 2010). The framework to capture payments for the last two services are currently being developed by the MARD (VNFF, 2014a).

The policy also determines users and suppliers of forest environmental services. The former includes hydropower plants, water supply companies, tourism companies, and industrial establishment, and the latter consists of individuals, households, communities, and organizations who hold forested land titles and are contracted to undertake forest protection activities and ensure the maintenance of forest environmental services (Government of Vietnam, 2010).

The price of services charged to services users was determined by the Legislation Department of the MARD based on existing studies during the formulation of *Government Decision 380* in 2008. While the fee charged to hydropower companies and water supply companies is the same under *Decision 380* (i.e., 20 VND (US 0.125 cents)/KWh and 40 VND (US 0.250 cents)/m³, respectively), the fee to tourism businesses is slightly changed. Tourist operators were charged 1-2% of their annual revenue instead of 0.5-2% as stipulated in *Decision 380*. However, the reason for this change remains unknown. Notably, the fee charged to industry has not yet been implemented. For direct payments (i.e., the user and provider sign the contract directly), the decree states to use established prices for the required minimum (McElwee, 2012).

The amount of PFES payments received by services suppliers, according to the decree, would depend on the characteristics of the forest areas covered by the payment. Payments would be calculated using the K coefficient, which takes into account four elements, namely, forest condition and yield (i.e., K₁),

forest use (i.e., K_2), forest origination (i.e., K_3), and the level of difficulty of protection (i.e., K_4) (Government of Vietnam, 2010; ADB, 2014). According to Tan (2011, p.19), “The idea of a K coefficient is to take into account variation in natural and socio-economic conditions for different types of forest in the province so that equity and fairness in duties and benefits of the services sellers can be achieved.”

For indirect payments, the central FPDF is responsible for supporting the operation of the provincial FPDF and for collecting, coordinating, and monitoring payments to the provincial FPDF in areas where environmental services are supplied from two or more provinces. If users only use services from forests located in one province, the responsibility of collecting money from service users and of making payments to forest owners belongs to the provincial FPDF.

Decree 99 stipulates that 0.5% of the total money collected by the MARD is to be kept at the central FPDF to cover the administration costs and that 10% and 5% are used for administration costs and natural disasters, respectively, at the provincial-level. The remaining 84.5% is supposed to be paid directly to the suppliers of environmental services. It is also stipulated that household forest owners can keep 100% of the received amount. Forest owners who are organizations (hereafter, organization forest owners)¹⁹ can take 10% of the collected payments for their overhead costs before making payments to contracted households.

Overall, the legislative and institutional framework for implementing PFES nationwide is firmly in place. However, a few key elements of the regulatory and implementation mechanisms are still missing. For example, monitoring and enforcement mechanisms applied to services users (e.g., noncompliance of making payments), services providers (e.g., monitoring the provision of environmental services and noncompliance of implementing a payment contract), and intermediaries (e.g., monitoring payments flows) should be regulated in the near future (ADB, 2014).

4.3.2.3 The PFES policy design in Hoa Binh province

Since January 1st, 2011, PFES policy has been compulsorily implemented nationwide in Vietnam. The start of PFES in Hoa Binh province began with the establishment of the Provincial Steering Committee (Hoa Binh Provincial People's Committee, 2011a), followed by the formation of the Hoa Binh Forest Protection and Development Fund (hereafter, HB Fund) at the end of 2011 (Hoa Binh Provincial People's Committee, 2011b). The main activities in 2012 were the establishment, documentation, and finalization of institutional arrangements necessary for the implementation of PFES.

¹⁹ Organization forest owners include Management Boards of Special-use and Protection Forests, Management Boards of Nature Conservation Areas, state forest enterprises, and private companies.

The underlying reasons that explain why very few activities were completed in 2011 and 2012 are that the provincial government had to focus on completing on-going activities under *Program 661*'s one-year extension (DFD_6_1). In addition, the HB Fund did not receive any financial support from the provincial budget to carry out a project on identifying service users and eligible areas for PFES in the watershed of Hoa Binh hydropower plant, without which making payments to service providers could not start. Subsequently, the HB Fund, after an 11-month wait, was given financial approval to use a contingency fund in 2011-2012 to finance prerequisite activities (Hoa Binh Provincial People's Committee, 2013a). Importantly, provincial authorities waited for an official declaration from the MARD, which was given in *Decision 3003* on November 29th, 2012, on the Hoa Binh province's watershed areas in the watershed of Hoa Binh hydropower plant, which is shared with other five provinces (MARD, 2012b). The project was officially approved in August 2013 (Hoa Binh Provincial People's Committee, 2013c).

According to *Decision 3003*, the overall watershed area of the Hoa Binh hydropower plant is 2,605,000 ha, of which 1,137,620 ha is forests and thus eligible for PFES. The shared forest land area belonging to Hoa Binh province is 116,667 ha, of which 48,869 ha is forests, equivalent to 4.3% of the total forested watershed area. However, the HB Fund claimed larger watershed and forested areas, namely, 122,206.04 ha and 74,013.02 ha or 6.51%, respectively. Their argument was based on three elements: the forested areas that were recorded by provincial authorities differed from figures that were stated by the MARD; measures in the agricultural and forestry sectors contained errors; and the consultant applied old data to estimate corresponding forested areas. All of the above are reflected in the following statement of a provincial forestry official: *"Firstly, we know fairly well the current status of the forest within Hoa Binh province as we have carried out Program 661 for 12 years. Secondly, the error in the forestry sector is very large and the 10% change in forested area is still currently allowed [the MARD will not adjust the shared forested area among provinces unless the forested area within a province increases or decreases by more than 10%]. We thus think that the area proxies stated by the MARD contain errors. We also see that the consultant used images from satellites in 2006, which were already outdated. Furthermore, we recognize that the quality of images depends much on numerous elements, even weather conditions. More importantly, forests have significantly changed since 2006 up to now [2013]. Therefore, we are strongly confident to decide to re-investigate our actual forested area"* (DFD_6_1). This request was verified and approved by the MARD and went into effect in 2013 (MARD, 2013). This adjustment implies more entrusted PFES payments (i.e., about 6.27% of total monies the VNFF collected annually from Hoa Binh hydropower plant) will be transferred to the HB Fund beginning in 2013 instead of 4.3%. Farmers will also benefit more economically from the adjustment.

Generally, the eligibility for PFES in Hoa Binh province, similar to other provinces in Vietnam, is mainly based on geographic criteria (i.e., the participant must live within the watershed area) and

having closed canopy forests. Despite the guidance of the K coefficient in Decree 99, the currently applied K coefficient is 1 for natural forests and 0.8 for planted forests for Hoa Binh territory (Hoa Binh Provincial People's Committee, 2012). The comprehensive application suggested that K coefficients would have been ideal but the application was rejected for several reasons. First, the determination of forest conditions and yields (i.e., K_1) is extremely challenging due to its time-consuming process, the limited capacity of implementing officials, and the absence of a budget to do this work. Furthermore, the application of the K_1 coefficient might result in complications, necessitating followed-up activities, such as monitoring and verification. Moreover, because the forest quality is similar throughout Hoa Binh province, it is not necessary to differentiate the forest quality by using different K_1 coefficients. A provincial official stated, *“In general, the quality of the forest in Hoa Binh province is poor and similar among locations despite its high forest cover. The forest is highly rehabilitative, which resulted from extreme exploitation before the 1990s, except for two to three Nature Conservation Areas”* (DFD_6_1). Second, the difficulty level of forest protection (i.e., K_4) is also omitted due to terrain similarity among locations in the watersheds. This was mentioned by another forestry official who stated: *“High and steep hills, remote areas, difficult access are the main characteristics of all locations in the watershed of the Hoa Binh hydropower plant”* (MB2_6_5). Third, the forest use (i.e., special-use forest, protection forest, and production forest - K_2) is similar to forest origination (i.e., K_3) under the context of Hoa Binh province. Accordingly, special-use forests are always natural forests and for these, K equals one. Protection forests include both natural and planted forests, of which natural protection forests are subsequently paid and K equals one, whereas K equals 0.8 for planted protection forests and production forests (which are mainly planted forests). K_1 , K_2 , and K_4 coefficients were not applied for estimating payments for service providers. There were three major points made by interviewees at the provincial-level. First, the idea behind a K_3 value higher for natural forests than for planted forests is due to higher forest cover and better watershed protection functions from natural forests. Second, the application of the K_3 coefficient is a lesson learned from piloted projects in Lam Dong and Son La provinces. Third, *Decree 99* stipulates that the provincial-level is responsible for decisions regarding K coefficients. In summary, the application of only one K_3 coefficient has facilitated the implementation of PFES policy due to its simplicity. This is particularly relevant to a new PFES policy in its very early stage.

Apart from the decision on the K coefficients, the Provincial People's Committee also adjusted the payment level charged to tourism businesses. Provincial authorities set the charged fee at 1% of gross revenue, instead of 1% to 2% which was suggested by the central government (Hoa Binh Provincial People's Committee, 2013b). The setting of this minimum payment level reflects an expectation from authorities to more easily obtain consensus from service users.

The HB Fund formed a team to monitor, verify, and make payments to nine organization forest owners regarding their forest protection performance in the watershed of the Hoa Binh hydropower

plant and will repeat these tasks in other intra-provincial watersheds in the future. Meanwhile, MB2 was assigned to create a team to conduct similar activities, but for 19,834 household and/or community forest owners in the watershed of the Hoa Binh hydropower plant. There was, however, no administration costs allocated to MB2 for carrying out these tasks, despite the HB Fund's initial effort in transferring half of their allocated administration costs to MB2. This transfer was refused because it breaches Ministry of Finance's regulations.

To summarize, the design of PFES at the Hoa Binh provincial-level is under the guidance of the central government and rules have been specified towards simplicity, which, in turn, facilitate implementation at lower levels.

4.3.3 Institutional performance

It would be premature to draw comprehensive assessments on the economic, social, and environmental performance of PFES since the program has only been implemented nationwide for three years. Instead, this section attempts to provide preliminary analyses to uncover opportunities and challenges for implementing PFES that could be used in the future.

4.3.3.1 The coverage of PFES and disbursement at the local-level

[Table 4.1](#) provides the general view of the current coverage of PFES in Hoa Binh province. To date, PFES is currently being implemented in the watershed of Hoa Binh hydropower plant, leaving all other watersheds underdeveloped.

According to the VNFF (2014b), the disbursement rate of the 2011-2012 fund in the watershed of the Hoa Binh hydropower plant was 65.3% (as of December 31st, 2013), which increased to 88.2% for the disbursement of the 2013 fund (as of February 27th, 2014). To date, 100% of household forest owners and 88.9% of organization forest owners (i.e., 8 out of 9 organizations) have been paid.

Interviewees at the provincial-level revealed reasons for a low rate of distribution for the 2011-2012 fund and the incomplete distribution of the 2013 fund, namely, the late start of PFES (reasons are mentioned in [Section 4.3.2.3](#)), a long wait time for the financial approval, and a time-consuming process to identify services users and their corresponding forested areas. In addition, one organization was unable to receive payments because of an unsolved tenure dispute in which forest land was allocated to the organization and to households.

Table 4.1: Coverage of PFES in Hoa Binh province

	Currently (as of March 2014)			Potential
Environmental services	Soil and watershed protection	Clean water production	Soil and watershed protection	+ Landscape beauty + Forest carbon sequestration + Spawning grounds for aquaculture
Environmental service users	The Hoa Binh hydropower plant	The Hoa Binh clean water supply company	The Ba Thuoc II hydropower plant	- <i>Short-term</i> : + 6 hydropower plants with intra-provincial watersheds + 3 clean water companies with intra-provincial watersheds + 1 clean water company with interprovincial watershed + 10 tourism operators inside the province - <i>Long-term</i> : + International carbon market + Companies benefit from spawning grounds for aquaculture + Industrial establishments
The start of payments	2011	2013	2013	
Responsibility to collect PFES payments	The Vietnam Forest Protection and Development Fund	The Hoa Binh Forest Protection and Development Fund	The Vietnam Forest Protection and Development Fund	- The Vietnam Forest Protection and Development Fund - The Hoa Binh Forest Protection and Development Fund - Service users who want to make payments directly to service providers
Area covered by PFES	74,013.02 ha	74,013.02 ha	27,000 ha	
Environmental service providers	19,843 household forest owners and 9 organization forest owners ^(*)		Not available	
Environmental service payments	134,233.94 VND (US\$ 5.6)/ha for 2 years (2011 and 2012) 124,318.896 VND (US\$ 4.8)/ha for 2013		Not available	
Principal environmental service intermediaries	- The Hoa Binh Forest Protection and Development Fund (HB Fund) - Management Board of Da River Protection Forest (MB2) - Commune and village representatives			

(*): The share of the watershed area of Hoa Binh hydropower plant that belongs to the territory of Hoa Binh province is also part of the watershed of the Hoa Binh clean water supply company.

Source: Authors' compilation based on in-depth interviews at the provincial-level in 2014 and based on annual reports from 2012 and 2013 from the Hoa Binh Forest Protection and Development Fund.

On the one hand, provincial authorities complained about difficulties in collecting money from service users in intra-provincial watersheds. On the other hand, their inability to clearly define watersheds eligible for PFES may potentially hamper the distribution of PFES monies, even if provincial authorities could succeed in getting services users involved in the payment for environmental services. For instance, implementing agencies are not able to determine watershed areas for most tourism businesses and for some water supply companies. This implies that the

suppliers of environmental services are unknown and thus the money proposed to transfer to such providers would be held off. One official from the HB Fund reported that, “*It is not straightforward to identify the suppliers for landscape beauty services. For example, in the case of one tourist operator in Mai Chau district, we might have to include a whole district to be eligible for PFES payments*” (PFund_6_3).

4.3.3.2 Farmers’ perceptions of PFES

Farmers have diversified views regarding the PFES concept. Approximately 78% of the respondents perceived PFES as just an annual forest protection program financed by the central government (Table 4.2). This perception is likely to be driven by the presence of a financial government subsidy for forest protection in the resettlement region since the Hoa Binh hydropower plant began operating. For instance, a farmer in Da1 village reported that, “*We receive money for forest protection annually, but the payment varies year by year*” (P797_5). However, some respondents (14.2%) – mainly commune and village officials – could explain fairly well that in PFES, environmental service users pay farmers for their efforts in protecting forests. Furthermore, more than 70% of respondents mentioned nothing about requirements for being entitled to receive to PFES. This means that they did not know which type of forest (i.e., natural forest, planted forest, or both) and how old forests have to be to be eligible and suitable, respectively, for PFES. In particular, some respondents thought that forest land with or without trees are all eligible for PFES. Moreover, about 88% of respondents perceived that the beginning of PFES would be much later than its actual beginning.

Table 4.2: Farmers’ perceptions of PFES

Indicator	Percentage (%)
1. What is PFES?	
Do not know	5.8
A program of forest protection paid for by service users	14.2
An annual program of forest protection funded by the central government	77.5
A program of forest land allocation	2.5
2. When did PFES start?	
2011-2012	12.5
Other	87.5
3. What are conditions to be eligible for PFES?	
None	73.3
Canopied planted forests	9.2
Possession of the forest land use rights certificate (i.e., the Red Book for forest land)	13.3
Other	4.2

Source: Own data from in-depth household interviews and focus group discussions in 2014

The misunderstanding of farmers about PFES results from limited and incomprehensive information in the outreach phase, the low level of education among village headmen and farmers, less frequent attendance of village meetings by villagers, and unsuitable village meetings times.

The dissemination of PFES reached few representatives at the commune and village levels. The manner in which local communities learned about PFES was only through the village headmen. However, village headmen are not always able to provide a complete picture about PFES in a straightforward manner to the villagers. A commune government official provided the following comment: “*Some village headmen are not able to circulate PFES well. As a result, farmers are unaware of the money they had been paid*” (ECPC_6_4). In addition, most people attending the village meetings were not able to acquire all of the information provided and there was no information exchange among household members after the meetings. On average, across the villages in the study area about 70% of household representatives were present at the meetings they were required to attend. Moreover, the meetings were during the daytime, which is when agricultural activities inhibit attendance. For example, in Da1 village the meeting time for the PFES information meeting was in the afternoon, whereas previous village meetings were held in the evening.

4.3.3.3 Short-term additionality and the potential of the environment services provision

Thus far, the literature has provided no explicit indicators to measure the actual delivery of ecosystem services resulting from the implementation of environmental schemes. As a result, area-based proxies can be used to estimate the provision of environmental services (Corbera *et al.*, 2009; Legrand *et al.*, 2013; Prokofieva and Gorriz, 2013). Or, a qualitative evaluation can be made (Sommerville *et al.*, 2009). On the other hand, key factors hampering efforts to monitor the provision of environmental services in Vietnam include data scarcity, inconsistency, and unreliability, as well as the poor capacity of government agencies to undertake monitoring, particularly at the local-level (Jack *et al.*, 2007 cited in Thuy *et al.*, 2013). As a result, and given the high cost or even impossibility of measuring the environmental effects of PFES policy, the government selected forest cover as the proxy for most environmental services, leaving the connection between forest cover and environmental service outcomes in the debate (*ibid.*).

In accordance with this approach, PFES payments to forest owners in Hoa Binh province were based solely on the area forested, rather than on the outcome of environmental service delivery resulting from the forest. In this regard, the area-based proxies established in the approved project on implementing PFES in the watershed of the Hoa Binh hydropower plant can be considered as the baseline for assessing PFES, although authorities admitted that errors had occurred and that there was the potential for more errors. In the baseline, forest cover was determined to be 49%, comprised of 55,210 ha of natural forests and 18,803 ha of planted forests. Since PFES payments had actual begun, there was no report stating that the forest cover had been assessed in the province. The design of

PFES has informed the eligibility of PFES, namely that participants must live within the watershed and have forest areas that are canopied (for more information, see [Section 4.3.2.3](#)). Therefore, the number of pre-defined participants (i.e., the number of forest owners) would remain the same unless there were a reallocation of forest land.

Given the reasons mentioned above, additionality is evaluated based on the analysis of potential changes in the area covered by PFES and on the number of non-compliant participants.

Area covered by PFES

Regarding the areas of planted forest, according to the point-of-view of an experienced provincial-level forestry official, farmers living in remote areas within the watershed are generally not motivated to plant forests because of access difficulties, which inhibit tree seedling delivery and harvesting (Pfund_6_3) (see more in Huong *et al.*, 2014). However, in locations with better conditions, there has been attention given to planting commercial forests. This trend results from the awareness of farmers about the decreasing productivity of agriculture and about the increasing value of forest land, as well as from neighbor effects, the government subsidy, and the expectation of declaring property. Farmers realize that there has been a considerable decrease in the productivity of agriculture, which is mainly driven by the lack of intensive farming (i.e., low levels of fertilizer application) and the steep slope of the land, making the land unsuitable for agriculture. These circumstances become more challenging in a region with few opportunities for off-farm employment, a low amount of forest land for production, and a low amount of paddy land per household. As a result, increasing forest plantations through re-planting forests directly after trees are harvested or the planting of new trees in low yield maize and cassava plots are possible solutions to help farmers in light of conditions threatening their livelihoods. Furthermore, villagers were motivated to plant forests due to visible outcomes from their neighbors' forests and their recognition that the selling price of timber (such as acacia) harvested from planted forests was higher than the selling price of non-timber forest products (NTFPs) extracted from natural forests. In addition, farmers benefited from free seedlings from government subsidies (e.g., *Plan 57, Program 135*, and the *Stabilizing Settlement and Social-economic Development in the Resettlement Region along the Da River* project). Farmers also benefited from the self-growing ability of some tree types (such as acacia and bodhi) that can be grown from their own fruit. Finally, through planting forests, farmers expect to claim their control of the forest land and trees on it.

The above incentives for the development of forest plantation are financial and social, which appear to be sustainable overtime. For example, the village headman in Da1 village stated that, "*Special attention has been paid to forest plantations in the past ten years. Trees are re-planted directly after their harvest and become forest just three years later*" (P_6_4). Furthermore, to confirm the development of planted forests in the province's entire territory, an official from the DARD said, "*The increasing area of planted forest in the private sector is reflected by annual verification outcomes at*

the local-level. For example, in 2013 the total area of planted forest was about 8,600 ha, of which approximately 3,600 ha were planted by the state bodies and the remaining 5,000 ha were certainly planted by farmers and private enterprises” (DARD_6_5).

Similarly, in recent years natural forests are being better rehabilitated and protected, which results from a change in traditional habits among farmers, the development of planted forests, the quality and characteristics of the natural forests, and laws and regulations. First, large areas of natural forests have been rehabilitated as local people gave up upland rice cultivation. This was not a result of strict policies, but instead was mostly due to insufficient economic benefits that could be derived from upland rice cultivation. In fact, one local person reported that, *“If they would continue benefit from upland rice cultivation, they [farmers] would never have given-up” (P756_1)*. Second, farmers argued that the income that could be derived from the development of planted forests would mitigate illegal logging of natural forests. A local person stated, *“Farmers are busy taking care of their planted forest and earn money from harvesting these forests. These factors have helped reduce the illegal cutting of trees in natural forests” (P36_N_4)*. Third, the quality of natural forests is a result of past overexploitation and is currently characterized by a scarcity of NTPFs, including fewer bamboo shoots and animals, the absence of high quality timber, and the presence of trash timber²⁰. A farmer in the focus group discussion in Co1 village said, *“The high-value wood trees disappeared, leaving the rest - just bushes and trash timber. Years ago, the villagers frequently went into the forest to collect natural bamboo shoots. Today, one person is often not able to collect any bamboo shoots because it is becoming scare. Animals that are hunted in the forest are mainly mice and are rarely squirrels or snakes” (E376_5)*. A farmer in a focus group discussion in Da2 village had a similar view and reported, *“It could be impossible to hear the sound of a falling tree [due to logging] if the forests were thick. But, there is no remaining tree in our village forest that can fall” (N17_N_5)*. In addition to the limited economic benefits that can be derived from the remaining natural forests, there are other major factors that prevent farmers from violating laws and regulations aimed to protect the natural forest. These factors are the: long distance and difficult access to natural forests; low selling price of trash timber; small number of exit areas from forests for illegal loggers; ability to be readily observed by others when harvesting natural forests; and the enforcement of laws and regulations related to natural forests. A forestry official who is a member of the VFGG joined a focus group discussion in Da1 village and mentioned, *“Trash timber in the natural forest is quite cheap - even cheaper than acacia. Hence, if someone intentionally cuts a tree, he must take into account that a cubic meter of illegally logged timber must be transported a long distance in dangerous terrain and can only be sold at a low price. In addition, he must exit the forest here [pointed to the forest] where we can seize him. This*

²⁰ Trash timber comes from small woody trees that are low in quality and value. Farmers are not allowed to harvest trash timber in natural forests since they are not allowed to cut trees there.

would mean that his day of hard work has been lost. Although we may not know of every case, we can control up to 70-80% of the total violations” (P36_N_4).

The actual performance of forest protection and the number of noncompliant participants

The actual performance of forest protection in both planted and natural forests at the village-level is described in [Table 4.3](#). Farmers are responsible for patrolling their own planted forests, whereas the VFGG, which consists of five to seven mass organization leaders, is responsible for patrolling natural forests. This group goes into the natural forest once per month, on average, and visits bordering areas during bamboo shoot season, before maize cultivation season, and before the New Year holiday. In addition to the VFGG’s patrol, every community member is also responsible for detecting and reporting violations to the village headman. These responsibilities are stipulated in each village’s common regulations (i.e., *hương ước xóm* in Vietnamese). Most local people who do not have forest land said that they did not illegally log, start a forest fire, or open a new field through deforestation in the past 12 months. Most households that have forest land reported maintaining (48%) and patrolling (42%) their own planted forests. The patrol of planted forests is easier for these households since compared to natural forests, planted forests are usually closer to households, roads, and/or fields, making them easier to observe and allowing people to combine agricultural production with forest patrol, which saves them time. Furthermore, farmers’ familiarity with the terrain and their controlled raising of livestock facilitates the protection of planted forests. Focus group discussions with VFGGs from several villages revealed that in the past five years, there were no forest fires or illegal logging, and that there were only a few cases of forests being cleared for agriculture.

Table 4.3: Forest protection in the past 12 months

Activity	Households having no forest land (%)	Households having forest land (%)	Average (%)
"Did nothing"	79.4	4.8	17.3
Forest maintenance (such as removing grass and debris)	0.0	47.9	39.9
Patrolling	0.0	42.4	35.3
Speaking with offenders	10.3	2.1	3.5
Informing the village headman about a violation	10.3	2.8	4.0

Source: Own data from in-depth household interviews and focus group discussions in 2014

In summary, it can be seen that forest cover tends to increase compared to the baseline given the improved protection of natural forests (from laws, regulations, and improved forest rehabilitation) and planted forests (since farmers spend more time monitoring and caring for their planted forests which they consider to be their own asset). In other words, there is evidence for the additionality of PFES. Moreover, the additionality of planted forests is likely to be sustainable over time, while the

additionality of natural forests is likely to be threatened in the near future when timber and other high-value forest products re-appear after forests are rehabilitated, unless there has a well-functioning monitoring and benefit sharing mechanism in place.

4.3.3.4 Benefits and negative impacts of PFES

This section focuses on analyzing the consequences of PFES concerning economic, environmental, social, and cultural aspects.

Economic aspects

Taking into account the benefits generated from the implementation of PFES, the study reveals that PFES payments are an income source for households. In addition, local people receive more benefits from PFES compared to previous forest protection programs given the inclusion of more forest types eligible for PFES, as well as the unlimited time period of payments (i.e., payments are received as long as the program continues). Furthermore, PFES provides incentives to local people to declare forest land as their property. These benefits are discussed in more detail below.

Despite criticisms among farmers about low PFES payments per ha (124,000 VND (US\$ 4.8)/ha in 2013) compared to previous forest protection programs, such as *Program 661* (200,000 VND (US\$ 10.7)/ha in 2010), most viewed cash payments as an income source, especially the poor. The timing of the payment delivery (close to the New Year festival) further enhances the payment. On average, the majority of the cash payment is used to buy food for the New Year holiday (67% of the payments were used, on average, for this purpose). Other uses are agricultural inputs (19%), school tuition fees (12%), and forest plantation (2%). Only a few respondents said that the payment is small, yet they admitted that the payment is “better than nothing.”

Planted forests, including protection forests and commercial forests, are eligible to receive PFES payments. Under the previous forest protection programs, protection forests were entitled to receive a subsidy for a limited period time (usually five years) and commercial forests were ineligible to receive subsidies for protection.

As stated above, PFES payments are received as long as the program is in place. As a result, the overall financial benefit of PFES to farmers is greater despite its lower payment level per ha, compared to previous programs which were limited in time. For example, under PFES Co1, Da1, and Da2 villages received more money from 65 ha, 411 ha, and 58 ha of their planted commercial forests, respectively, than they received under previous programs. Benefits to farmers include income from harvesting the forests and from PFES payments. Moreover, among the communities studied, Da1 and Da2 villages belong to the “old” watershed where farmers had received a government subsidy for headwater forest protection since the Hoa Binh hydropower plant began operating. This means that

Co1 village was one among many villages that became eligible for PFES due to the new method that was applied to define the watershed area.

PFES offers farmers the chance to declare property rights. For example, about 13% of respondents reported that they joined the program because it provided them with opportunities to claim control over their planted forest land. Two-thirds of these people believed that they had succeeded in terms of planting trees according to their preferences, obtaining income from PFES, harvesting, and excluding other people from extracting timber illegally.

In terms of overall negative economic impacts, the analysis finds that the lack of agricultural land and discouragement of livestock development are consequences of PFES. Most of respondents argued that the lack of land for agricultural production has, in part, been caused by the high amount of forest land dedicated to protection under conservation-oriented forestry policies, including PFES. This argument is a very serious issue in areas where farmers lost most, if not all, of their agricultural land due to displacement for the construction of the Hoa Binh hydropower plant. One farmer in Da2 village said, *“Before, we had paddy rice land and the government did not prohibit upland rice cultivation. Thus, we had never faced hunger. Today, we suffer from hunger since the paddy rice land floods and farmers are prohibited from clearing the forest”* (N1074_1).

Moreover, as there is only a small amount of land left for agriculture, farmers are not provided with incentives to develop livestock production. The data strongly argues that rather than a lack of labor, the root cause of underdeveloped livestock production is the lack of available land to provide enough space and food for livestock. Since there is no more grazing land to maintain the tradition of livestock grazing freely, households are forced to send a household member to care for their cow(s) and/or water buffalo(es). This reduces the availability of labor for other agricultural production activities. If a livestock owner allows his or her livestock to graze, the livestock would stay at risk since they could die from falling down a steep hill or from being killed by others for destroying their forests and fields. Moreover, livestock owners could be criticized for their lack of control over their livestock and could be fined if their livestock damages forests. Several projects aimed to support the development of livestock production, but none succeeded. Although farmers may benefit from temporarily occupying the area, given the good soil fertility and disparities in the reservoir’s water level between the dry and rainy seasons, priority was given to maize production rather than livestock production. Farmers in focus group discussions across the villages had similar comments about the lack development in livestock production. For example, one farmer reported, *“The lower parts are the reservoir and the upper parts are fields for agricultural production. In the dry season, we have a little extra land that emerges in the reservoir area, but this land is often used for maize cultivation. If we were to raise livestock in stables, then we must use land for growing grass. When we received buffaloes and cows*

from projects, we all thought that it was easy to raise them, but we failed. The failure was because there was no land for grazing – not because of our technical inability.” (P36_N_4).

Environmental aspects

According to farmers, the environmental benefits derived from implementing PFES include a healthier environment, the restoration of water sources, and the increasing awareness among farmers about the forests’ environmental benefits.

Despite a debate in the scientific community about the impact of forest cover on water quantity and quality (Thuy *et al.*, 2013), farmers interviewed for this study believed that protection activities increased the amount of water in the springs, both for themselves and for maintaining the operation of the hydropower plants. Farmers also believed that forest protection is important to have access to a healthier environment, to reduce landslides, and to avoid floods. A government official at the commune level confirmed this, saying, *“In the past ten years, water sources have been restored and maintained as the result of better forest protection” (TMCPC_6_4)*

There is a growing awareness among most respondents at the household and administrative levels about the environment. However, no one affirmed that this resulted from PFES or previous forestry programs. The improved awareness among farmers is reflected by their decision on planting forests instead of converting forests into agricultural production, such as maize, which could result in greater economic gains. One experienced forestry official at the provincial-level provided the following example: *“Assume that maize is cultivated once a year and that a new variety could yield 5 tons per ha per year. If the selling price is 3 million VND (US\$ 116.8) per ton then one could earn 15 million VND (US\$ 584.0) per ha per year. Meanwhile, acacia can yield 70 cubic meter per ha per seven years. This is equivalent to 50 - 60 million VND (US\$ 1,946.5 - 2,335.8) if the wood is sold. In addition, one could receive approximately 124,000 VND (US\$ 4.8) per ha per year from PFES [the PFES payment level in 2013] that takes effect from the fourth year when acacia could canopy. On the other hand, the average annual revenue from cultivating maize multiplied by seven is 105 million VND (US\$ 4,087.7). To summarize, the economic gain of forest plantation, including the PFES payment, is far less than the revenue from maize cultivation in the same period of time [seven years]. Although people living in the watershed are mainly poor, they do not convert forest land into agricultural land because they are aware of the environmental values of forests” (DARD_6_5).*

Apart from the environmental benefits derived from the implementation of PFES, it is argued that the characteristics of the watershed, such as limited agricultural land, few off-farm employment opportunities, and the pressure of increasing population, remain the main threats to the sustainability of forest protection. One farmer talked about the most important element that would impede forest protection. He said, *“Before, our village had more trees. Since the construction of the Hoa Binh*

hydropower plant, people lost their agricultural land. The lack of agricultural land has hindered the effectiveness of the protection activities” (P614_1).

Social and cultural aspects

The study shows that the positive social effects of PFES consist of: more people receiving PFES money compared to previous forestry programs; the inclusion of the poor and landless in PFES; the higher commitment among farmers to protect forests; improved information about PFES payments, facilitating information-sharing; and the contribution of PFES to maintain the cultural tradition of building and living in homes that are constructed from locally extracted timber. The negative social consequences of PFES include dissatisfied villagers, especially forest land owners, regarding the matter of benefit sharing and potential disputes and complaints arising from different financial incentives given to local people residing in the same watershed.

Under the implementation of previous forestry programs, the watershed of the Hoa Binh hydropower plant included 20 communes. Under PFES, this has expanded to 56 communes because of the different method used to define the watershed area. This means as the watershed expands, so does the number of people PFES payments.

Farmers asserted a higher commitment to protecting forests after the payment mechanism of PFES and the presence of implementing agencies on the ground became clear. Farmers were given plots of natural forest between 1994 and 1995, but were not provided with sufficient rights as forest owners due to strict harvesting and benefit sharing policies (see more in Huong *et al.*, 2014 for further detail). PFES payments that are currently allocated to these owners have resulted in a higher commitment to protect their forests, although some have argued that these protection activities occurred even before PFES began. Farmers felt that it was easier to ask everyone to participate in collective action activities, such as agreeing to not illegally cut down trees. For example, one respondent said, *“Everyone receives the same amount of money, so asking for participation in collective action is getting much easier” (N1074_1)*. Another respondent reported, *“If there is no payment from the program, farmers would clear the forest” (E_6_2)*. Furthermore, farmers perceive that the authorities have a special interest in forest protection through the presence of implementing agencies (e.g., a MB2 official) and enforcement authorities (e.g., a forest ranger) in village meetings as well as through dispute resolutions at the community-level. Moreover, the fact that farmers have actually been given PFES payments has induced them to believe that the payment would in reality be given for their efforts in forest protection. Therefore, the PFES payment considerably facilitates the dissemination of PFES’s information on the ground.

Regarding cultural values, the PFES payment is a financial incentive for farmers to conserve the natural forest so that they can extract the timber in the future to construct a new house. This falls in

line with common village regulations, as well as with the habit of the indigenous people. Building a new house from wood is a tradition that the people want to maintain for a long time. For example, one respondent said, “*We are used to staying in wooden houses, rather than houses made from brick*” (E_6_2).

Although the PFES policy stipulated that the right payment must be transferred to the right forest owners, it was modified at the community-level through the equal distribution of payments among household members, regardless of the true owners of the forest. On the one hand, the ability of every community member to receive PFES money is considered to be a positive social achievement towards the landless, who are mainly the poor, and households that have a small forest area. Their greater well-being resulted from the higher amount of money that they received compared to the amount that they would have received if PFES payments were restricted to forest owners only. In Da1 village, households with fewer people were made better off since the village decided to transfer equal distributions to each household, instead of basing distributions on the number of household members within each household. However, the landless were aware that although every household receives the same amount of PFES payments, the forest land owners maintain an advantage since they have the right to plant trees and gain benefits from harvesting forests. For example, a forest land owner can earn about 1 million VND (US\$ 38.9) per year from harvesting bamboo shoots, while the landless cannot. Furthermore, if some people received more money than others did or if some people received money while others did not, this would increase conflicts among villagers. In the study area, people are used to receiving the same amount of support, regardless of their income. For instance, government subsidies from Program 135 which provide rice and maize seedlings and salt initially targeted the poor in Da1 village, but had been changed to be equally allocated to each household in the village. Moreover, the equal distribution of PFES monies would result in a higher commitment to common forest protection activities among villagers, such as the commitment that everyone must help in case of a forest fire (see more in Huong *et al.*, 2014). On the other hand, this method of equal allocation resulted in complaints from landowners. One respondent reported, “*70-80% of the attendants in the village meeting agreed with the equal distribution, but there were 20-30% that still disagreed*” (P563_3). Dissatisfaction mainly focused on the existing level of inequality among villagers. Forest land owners felt that the payment structure did not account for the differentiation between those who protected the forest and those who did not, as well as between those who owned forests and those who did not. Therefore, they felt that their monetary payments would not be as large under the method of equal allocation. Moreover, if they anticipated the arrival of new households in the village, they felt that their payments would get even smaller. These forest land owners believed that if the right amount of money were allocated to the right forest owners, then the forest would be better protected.

In practice, households that were given natural forest plots between 1994 and 1995 were reluctant to follow the village agreement regarding the equal distribution of PFES money among households. In addition, the current distribution of PFES monies has led them to be fearful that they may have to share their forest land and trees with others.

In addition to the matter of benefit sharing, farmers were unhappy because they had to share the PFES money with commune and village governments. For example, Da1 village received an average of about 68 million VND (US\$ 2,647.3) per year from 2011 to 2013, which was higher than the other two villages in this study. The payments were allocated as follows: 10% was allocated to cover administrative expenses incurred by commune officials for PFES, 10% was distributed to village funds, and the remaining 80% went to households (amount to about 656,000 VND (US\$ 25.5) per household per year). A similar distribution of payments occurred in Co1 and Da2 villages. In Co1 village, the commune and village governments each kept 5% of the total PFES money and villagers received 90% (about 299,000 VND (US\$ 11.6) per household). In Da2 village, the total amount of PFES money paid to the village was an average of 11 million VND (US\$ 428.2) per year, of which 90% was given equally to households (about 113,000 VND (US\$ 4.4) per household) and the remaining 10% was given to the commune level for certifying documents and participating in the provincial implementing agencies' monitoring and verification of forest protection activities by households on the ground. The village management board received no money for helping to implement PFES-related activities. Furthermore, the fine imposed on offenders was given to the commune government, instead of being re-distributed to non-offenders within the village where the offense was committed (in case of Co1 village). This led to further disappointment among farmers. One farmer complained: *"The fine should be shared among the villagers who did not violate the forest instead of giving the fine to the commune. What they used the money for remains unknown"* (E2554_1). The proposal of the farmer makes complete sense as it would reward self-monitoring and sanctions among villagers, and strengthen grassroots' level motivation.

Finally, PFES could create disputes and complaints that result from different payments per ha given to farmers when service users in intra-provincial watersheds are involved in paying for environmental services. For example, farmers living in Da2 village in the near future would receive the PFES payment not only from the Hoa Binh hydropower plant, but also from the Suoi Nhap hydropower plant, as the watershed of the latter is located in several communes and in villages that include Da2 village, but not Co1 and Da1 villages. This similarity is likely to occur in other watersheds in Hoa Binh province. This implies that households undertaking similar activities to protect a hectare of forest would receive different payments.

4.3.3.5 Sustainability

User financing of environmental services

Currently, the finance source of the HB Fund is mainly the VNFF and is collected directly from services users in intra-provincial watersheds. For example, payments distributed from the VNFF made up 100% of the total PFES payments from the HB Fund in 2011 and 2012, up 99.4% in 2013 (Hoa Binh Forest Protection and Development Fund, 2013; VNFF, 2014b). This implies that services users in intra-provincial watersheds paid nothing in 2011, 2012, and only a little in 2013 ([Table 4.1](#)). Within the finance source allocated by the VNFF in 2013, the Hoa Binh hydropower plant accounted for 98.1%, while the remaining 1.9% was contributed by the Ba Thuoc II hydropower plant (Hoa Binh Forest Protection and Development Fund, 2013). However, the framework for payments made to service providers in the watershed of the Ba Thuoc II hydropower plant is currently being developed.

Although institutional and organizational arrangements at the provincial-level are in place, the HB Fund fails to convince intra-provincial-watershed service users to pay for environmental services, with the exception of the Hoa Binh clean water supply company. Underlying reasons for this include non-cooperation of service users that are mainly based on the shortcomings of policies and the lack of enforcement rules when implementing PFES. Most hydropower facilities complained about the incompatibility between Decree 99 and the policy of Vietnam Electricity (EVN). While EVN, a government monopoly that controls hydropower production for the national grid, is able to transfer PFES monies to final service users (i.e., the public) through higher bills, small capacity hydropower companies must bear PFES charges due to the fixed selling price of electricity specified in the 20-year contract with EVN. Similarly, the main concerns of tourism operators are that they would be charged a high payment level and that the proposed charge of 1% would be applied to gross revenue of a diversified-business company instead of revenue of tourist activities only. In particular, some claimed that their tourist business operated without the use of any forest environmental services. As a consequence, some service users avoided meeting with HB Fund officials, while others either begged for the deferment of payments or reported that their business did not have any profit. In addition, only a few hydropower plants agreed to sign the trust contract with the HB Fund, yet this began in January 2013, which was two years after *Decree 99* began to be implemented.

Moreover, there is currently no enforcement rule at the national-level that applies to services users who delay or refuse to pay PFES monies. The provincial government is therefore not able to issue their own enforcement rules without the guidance of the central government. A concerned official of the HB Fund said, “*We do not have the competence to impose a sanction on service users for payment delay or refusal. Even in the case of taxation, despite the existing Tax Law, many companies are still in debt. This means that the collection of PFES monies from services users in intra-provincial watersheds is challenging*” (DFD_6_1).

To face the challenges in collecting PFES monies from service users in intra-provincial watersheds, provincial authorities proposed the inclusion of a tax department representative in the Provincial Steering Committee, so that the tax department official could help the committee to collect money from service users. At the same time, the authorities sent reminder letters to service users regarding their payment responsibilities. Furthermore, the provincial leadership ranked watersheds according to their potential monetary benefit to decide whether to carry out the PFES in those watersheds. One provincial official reported, *“It is very challenging to implement PFES in intra-provincial watersheds because there is no provincial budget for carrying out prerequisite activities [i.e., identifying the watershed area and its service suppliers]. Moreover, the money that would be collected from these watersheds is not very much. Thus, the implementation of PFES in these watersheds may be carried out in the future”* (DARD_6_5).

Despite these challenges, given the significant contribution of PFES to the provincial budget for use in forest protection and development, provincial authorities strongly believe in the achievable collection of PFES monies from intra-provincial watersheds. This implies that financing from environmental service users would not be an issue in the long-term, provided that a large proportion of the payments are ensured by the VNFF.

Participation of environmental service providers

As mentioned earlier, the number of established forest owners (i.e., the number of pre-defined participants) would remain the same unless there is a re-allocation of forest land. This section focuses on analyzing whether farmers are motivated to continue participating in forest protection in case of the absence of PFES payments.

Farmers were asked whether they would continue protecting the forest if they were to no longer receive PFES payments. All households that planted forests confirmed their commitment to protect their own planted forests. For example, respondents in such households said, *“The people can give birth, but not the land”* (N993_3) and *“I will certainly continue [to protect the forest] even when there is no PFES payment. The common natural forest area in our village is small and poor. The paddy rice land is also too small. Renting out labor by day is a way to provide income, but it is not for everyone, mainly the young can do it. Forest plantation is the best way I can have a harvest and help improve the environment at the same time. I am even planning to ask to convert degraded natural forest into an agro-forestry production area”* (N17_N_5).

Regarding the common natural forests, most local people interviewed reported that they would continue their efforts in forest protection due to the forests’ environmental benefits, but none were assured of the sustainability of protecting the forests when forests are rehabilitated in the near future. Moreover, focus group discussions in Co1 village revealed that the trend of privatizing natural forest

is more likely to occur if PFES payments stop. As a consequence of the lack of land for agricultural production, local people would clear the natural forest and plant their own seedlings to gradually claim their control over such plots. This concern was also found among government officials at various administrative levels. For instance, one provincial government official said, “*I suppose that farmers must go back to deforestation because of their lives. This tendency would certainly happen as I have seen that not everyone can have an opportunity for off-farm employment*” (PFund_6_3).

To summarize, farmers’ commitment to forest protection reflects their continuous participation in the program through which the provision of environmental services is maintained. The confirmation of participation has further supported the additionality of the *PFES Program*, although the additionality of natural forests is questionable given the potential for illegal logging.

4.3.3.6 Management

Monitoring environmental services and contracts

At the central-level, the MARD has not yet introduced any requirements for monitoring forest quality, soil erosion, or water regulation, even though PFES targets each of these environmental services. The monitoring and evaluation system is described in *Circular 20*, which was issued by the MARD to guide PFES validation procedures (MARD, 2012a), refers only to the maintenance of existing forest cover as a proxy for environmental services and to final outcomes (Thuy *et al.*, 2013). As a result, a weak system that includes simple techniques for monitoring land users’ compliance with environmental service contracts was employed at the community-level. The assessment in this monitoring and verification system is strongly based on self-reporting by village headmen. Furthermore, officials check forest boundaries for compliance only if there is a dispute. It is argued that the limited number of implementing officials operating in large watershed areas and the lack of clear guidelines on how to deal with noncompliance are the main factors that impede monitoring by implementing agencies on the ground. For example, one provincial official provided the following vague criteria regarding verification on the ground: “*If forest lost a certain proportion which resulted from small-scale illegal logging or from legal extraction, but the remaining area still fulfills the function of watershed protection, the forest owner is eligible for being paid the full amount*” (PFund_6_3).

Information exchange between the HB Fund and environmental service users

Information sharing between the HB Fund and Hoa Binh hydropower plant (which represents service users), is weak given the limited information that is shared and the low frequency of information sharing. The HB Fund channels information to the Hoa Binh hydropower plant through meetings and annual written reports on the collection and disbursement of PFES monies. The two official meetings

held in 2012 and 2013 forced service users to make payments based on the law instead of scientific evidence of positive impacts on the hydropower plants' business operations from forest protection activities undertaken by upland farmers. Moreover, the Hoa Binh hydropower plant claimed that they have a right to know whether the money they paid is distributed to the correct forest owners with the appropriate payment amount and at the right time. They also said that they have the right to receive the report on the improvement of environmental services from the protected forests. A representative of the company complained, saying, “*Except for the reports from the Protection and Development Fund in Lai Chau province, the reports from other provinces are insufficient and unspecific. We have no information regarding the disbursement progress and the monitoring of money distribution to forest owners*” (HP_6_6).

4.3.4 Institutional interplay

Wert-Kanounnikoff and Rankine (2008) show that a supportive, or at a minimum a “compatible”, legal and policy framework across sectors is important, even for local-level PES schemes. The development and implementation of PFES policy in Vietnam is well-embedded in the national policy framework (Tan, 2011) through which the institutional setting, organizational arrangements, and the contractual and financial management regimes of the program have been well-documented by government decrees, decisions, and circulars (for more information, please see [Section 4.3.2](#)). In a particular, in Hoa Binh province our study shows that PFES has complemented rather than conflicted with other institutions in the forestry sector and with other sectors, as well as across organizational levels.

The development of PFES in Vietnam and in Hoa Binh province is completely compatible with the objective of the *Vietnam Forestry Development Strategy (2006-2020)*. At the national-level, the emphasis of the *Vietnam Forestry Development Strategy* is on “increasing the ratio of land with forest to 42-43% by the year 2010 and 47% by 2020” (Government of Vietnam, 2007, p.11), while PFES emphasizes “improving forest quality and quantity” (VNFF, 2014a, p.4). At the provincial-level, the *Protection and Development Plan 2011-2020* (i.e., *Plan 57*) in Hoa Binh aims to maintain forest cover in 2013 (49%), while strengthening protection and plantation in critical areas (DFD_6_1).

This study reveals that the connection between the *PFES Program* and *Plan 57* is a symmetrical horizontal interplay. The objectives of these programs are compatible as both target forest protection, although *Plan 57* also invests in forest plantation in addition to supporting forest protection. *Plan 57* provides financial support (i.e., seedlings and money) to farmers to plant trees, which provides benefits from PFES payments and harvesting to farmers and ultimately contributes to increasing forest cover which helps the overall *PFES Program*. In turn, PFES helps to address the shortage of the government budget in *Plan 57* to invest in forest protection. In theory, *Plan 57* aims to encompass both forest protection and plantation activities in the province's entire territory. Due to the limited

government budget allocated to both of these activities, the provincial authorities have given priority to afforestation in areas both with and without PFES and to forest protection in areas without PFES (PFund_6_3). However, forest protection in areas without PFES was not given a subsidy since the start of *Plan 57* in 2012 because the government budget did not provide enough to fulfill afforestation requirement. PFES monies are used to finance forest protection activities within PFES areas regardless of the forest type (i.e., protection or commercial forest). In other words, *PFES Program* is a non-state budget financially supporting the implementation of *Plan 57*.

Apart from *Plan 57*, the project on *Stabilizing Settlement and Social-economic Development in the Resettlement Region along the Da River in Hoa Binh province* began in 1995 and provides seedlings to farmers for forest plantation from 2009 to 2020. *Program 135* also offers farmers seedlings, although its focus is on poverty reduction – not forest plantation. *Program 135* also builds roads to fields and forests to facilitate seedling delivery (TMCP_C_6_4). The support of these programs towards PFES is considered to be a case of unidirectional horizontal interplay.

Our analysis also shows the unidirectional horizontal interplay in interactions between PFES and the continuous presence of governmental forest protection subsidy programs since the 1990s. For example, annual financial support from *Program 327* and *Program 661* was given to farmers to protect forests. This resulted in questions among farmers about differences between payments from already existing programs and from PFES. This increased the amount of time that local officials needed to explain PFES. On the other hand, the familiarity among farmers of working with forestry officials regarding signing contracts, self-monitoring forests, and receiving payments from previous forestry programs has had a positive impact on facilitating PFES.

The study points out that there is the case of unidirectional horizontal interplay between the *Forest land Allocation (FLA) program* which ran from 1994 to 1995 and PFES. The FLA impeded the implementation of PFES and could impede the implementation of any future forestry programs as well. First, all forest land areas were allocated to particular individual households under the FLA. As a result, PFES is currently facing a large number of households who are forest-owners (19,834 owners). Such a large number of forest owners has resulted in challenges regarding documentation and follow-up activities on the ground for implementation agencies for signing contracts, monitoring, verification, and making payments. Second, the FLA is nothing more than the legalization of forest land plots, which were cultivated for a long period of time by farmers. In addition, the location of these plots depended on farmers' preferences and traditional cultivation habits (e.g., cultivating in the upper parts or lower parts of hills). This fragmentation, on the one hand, has required more time and effort for on-the-ground activities by implementing agencies. On the other hand, during the verification stage of implementing agencies, this fragmentation has resulted in the exclusion of a number of households to be eligible for PFES in eligible communes since “*such scattered forest areas*

are usually not accepted for payment” (TMCPC_6_4). Fragmentation of forest land is unattractive for authorities implementing PFES due to high transaction costs.

Decision No. 672 (hereafter, *Program 672*) issued by the Prime Minister in 2006 aimed to improve the forest land administration by implementing two projects on cadastral mapping and issuing the forest land use rights certificate (i.e., the Red Book for forest land) (Government of Vietnam, 2006). We argue that this is a unidirectional horizontal interplay between *Program 672* and PFES. In practice, to determine which forests and forest owners are eligible for PFES, MB2 officials rely on maps created under *Program 672*. Meanwhile, these maps reflect the correction of the FLA’s shortcomings (i.e., cadastral mapping that adjusted for differences in areas on paper and in practice, boundaries between forest plots, and the re-allocation of natural protection forests to the entire community to match the law). However, this adjustment is not the panacea for all of the FLA’s negative consequences since there is still fragmentation and a large number of forest owners. Additionally, there has been slow progress and errors during the implementation of *Program 672* which further impede PFES. For example, the People Committee’s Chairman of Tan Minh commune spoke about errors that happened to his forest land after adjustments made under *Program 672*: “*I had three forest land plots, of which one is a natural protection forest plot that was set aside for conservation. However, I did not receive any compensation. The two remaining plots were lost without any explanation. Instead, I was given two other plots which are located in another village’s territory*” (TMCPC_6_4).

The *Additional Tree* project under the provincial Farmers Association and funded by Agricultural Development Denmark Asia (ADDA) provided techniques for forest plantation and forest fire prevention to farmers. For example, farmers learned to build fire lines and to create trenches across hills to prevent erosion. While there has not been a training course for farmers on forest fire prevention under PFES, the *Additional Tree* project is considered to be another unidirectional horizontal interplay. Among the three villages studies in the study area, the *Additional Tree* project is in Da1 village only.

Notably, at the community level, numerous non-PFES policies were implemented to improve the living standards of farmers and to mitigate pressure on forests. However, not many of these policies were successful because they lacked financial support after subsidies ran out (e.g., programs for livestock and pig development) or there was no market for the products made (e.g., farmers in Da1 village had to give up toothpick production since they could not find a market for toothpicks).

Moreover, future policies and programs in the forestry sector suggest that PFES will continue to be financed. For example, the national project *Afforestation and Protection of the Headwater Protection Forest in the Da river reservoir in 2015-2020* (Hoa Binh Provincial People's Committee, 2013d) that is currently being developed would cover all of the villages that are currently under PFES. This

implies that farmers would financially benefit more for each hectare of protected forest. In addition, with an available system of the FPDF, the national action program *Reduction of Green-house Gas Emissions through Efforts to Reduce Deforestation and Forest Degradation, Sustainable Management of Forest Resources, and Conservation and Enhancement of Forest Carbon Stocks in 2011-2020* (Program REDD+) (Government of Vietnam, 2012b) could be more effectively implemented. The Program REDD+ fund will be considered as part of the VNFF and the provincial FPDF (VNFF, 2013). In Hoa Binh province, the authorities believe that Program REDD+ will scale-up after its pilot project in Cao Phong district.

In addition, our analysis suggests the existence of unidirectional vertical interplay in which local forest management institutions at the community level positively influence the implementation of PFES.

The presence of the village headman in the implementation of PFES on the ground has helped to minimize public transaction costs of the program. This is a case of unidirectional vertical interplay in which PFES implementing officials are allowed to sign contracts for forest protection with village headmen instead of having to sign individual contracts with thousands of households who are forest owners. Furthermore, final verification on the ground is strongly based on the self-reporting by village headmen about the forest status within their village. One MB2 official acknowledged the role of the village headman, saying, “*With regards to everything about forest changes as well as everything else occurring in the village, we just need to work with the village headman*” (MB2_6_2).

Although the VFGG was formed to meet the requirement of common forest protection under PFES, the inclusion of actors who participate in this group must abide by the village common regulations. The group members are always village leaderships. This enhances a higher commitment to: forest protection, dispute resolution, and monitoring and verification of implementing officials on the ground. The active contribution of the VFGG further lowers transaction costs of implementing agencies. Similarly, the involvement of the provincial vice-chairman and leaders of technical departments in the Provincial Steering Committee for PFES aimed to easily and effectively mobilize the contributions of different agencies. Accordingly, the Steering Committee might use its political power to obtain data from the tax department on the business outcomes of services users and to convince services users in intra-provincial watersheds to be involved in PFES payments, even if the central government has not introduced any enforcement rules.

The villagers were supportive of including every community member in common forest protection activities. One official explained this agreement among farmers and recognized the role of the village common regulations to forest protection: “*In fact, forests are protected by the whole community. Some households might have 5-7 ha each while others have just 2000-3000 m². However, those that have little forest land cannot spend all of their time in the forest to protect it. This is certainly impossible*”

for those that have a lot of forest land. Therefore, the protection of the forest would not be possible if there were the absence of the village common regulations and a lack of growing awareness among farmers” (DFD_6_1). On the other hand, the village common regulations also stipulate that cows and buffaloes must be well-controlled to minimize conflicts of destroyed forest. In addition, villagers must get permission from the village leadership and the Forest Protection Department to extract a regulated volume of timber to build new houses. Overall, these tight rules have enhanced the enforcement of forest protection under PFES.

Moreover, villagers in Da1 and Da2 communities are allowed to convert certain degraded natural forests into agro-forestry land where agricultural production can be mixed with forest plantation in the first three years. This conversion helps farmers gain income from temporary agriculture production and allows this land to be eligible for PFES in the future. However, farmers could claim control over converted plots when the plot becomes a mature planted forest. Thus, if these conversions are allowed to continue without proper management, they may lead to a trend of transforming common property into private property.

Enforcement rules have not yet been introduced by the central government. Instead, noncompliance of forest protection contracts is enforced by strict sanctions at the community level. Depending on the degree of the violation, these sanctions include being criticized by the entire community in village meetings, not getting a health insurance card, and receiving a lower PFES payment. For example, in Co1 village, the fine imposed to the case of damaged forest due to a cow or buffalo is 200,000 VND (US\$ 7.8) per offence and the fine is 2,000 VND (US\$ 0.08)/m² for deforestation to create a new field. In Da2 village, the level of sanctions is gradually increased according to the number of violations. The fine reaches 500,000 VND (US\$ 19.5) for the third offence of damaged forest from uncontrolled livestock and the cow or buffalo is killed in case of a fourth offence. Withholding PFES monies is time sensitive since payments are made close to the New Year holiday. Therefore, this is considered to be the heaviest penalty and is the most effective rule for enforcing forest protection.

The rule that every household receives the same amount of PFES money has been strongly facilitated by on-the-ground realities that MB2 faces regarding the difficulty of identifying the real forest owners due to the complexity of *de jure* and *de facto* property rights at the village-level. For instance, farmers “borrow” forest land from one another to plant trees, but this is not officially documented. This means that the name that appears in the Red Book might not be the same name of the person who is currently occupying and maintaining a particular plot of forest land. Furthermore, the Red Book for forest land is the only legal basis for conflict resolutions, yet it has not been returned to farmers yet after it was collected for adjustments made under *Program 672*. In addition, most villagers are unaware of the forest types entitled to PFES ([Table 4.2](#)). The above suggests that it would take a lot of time and effort if implementing agencies were to deliver the right amount of PFES money to the right forest owners.

Thus, the method of distributing PFES monies equally among community members once again reduces public transaction costs of program implementation.

However, this study reveals that the implementation of PFES has been impeded by benefit sharing among stakeholders. Notably, a proportion of PFES monies is kept at the commune and village levels since there is no allocation of an administration fee to these local governments. This is incompatible with the regulations of PFES since forest owners should receive the full amount of PFES monies. In other words, the deduction of PFES monies made by commune and village authorities goes against the objectives of PFES. Moreover, the traditional cultivation habit of a particular ethnic group might hamper forest protection. For example, the Dao ethnic group prefers to stay and cultivate in the upper parts of hills. They are also familiar with extensive farming rather than intensive farming with fertilizer. Thus, when they recognize that the land is degraded, they move to a new place by deforesting land for cultivation. This swidden cultivation method is viewed as a key modifier of forest land in the province.

4.4 DISCUSSION

By implementing PFES, the central government has achieved multiple goals. At the same time, more stakeholders are involved in forest management (which relates to the social target), the government budget's burden has been reduced for forest protection (which related to the budget or financial target), and control has been maintained over forest resources (which relates to the political goal). This is also argued by other scholars who have examined PFES in Vietnam (e.g., Wunder, 2005; Suhardiman *et al.*, 2013).

From a design perspective, the central government has undertaken its role well in the design and implementation of PFES; however, the government cannot deny significant technical and financial support from “outsiders” (foreign donors) in the development of PES-initiatives in Vietnam (Wertz-Kanounnikoff and Rankine, 2008). Incomplete design and shortcomings at the central-level may have resulted in the poorer performance at lower levels. Specifically, when the top-down management approach is employed and enforcement rules have not been issued from the central-level, the provincial FPDF do not dare to create their own regulations. This, in turn, partially explains the failure of the provincial FPDF to collect PFES fees from most services users. Similarly, given that the central government has not yet established a system to monitor land user's compliance with payment contracts, the program remains weak in terms of monitoring its effectiveness and generating the desired services. This also implies the impossibility of determining the extent to which the *PFES Program* has successfully generated environmental services.

In addition, the current shortcomings of institutional design induce PFES to be similar to previous subsidy programs on forest protection, unless institutional design improvements are made (McElwee,

2012; Thuy *et al.*, 2013). First, the provision of environmental services is evaluated based on forest cover despite the debate about linkages between forest cover and its function for environmental service delivery. On the ground, implementing agencies employ forest cover proxies as the basis to make payments to forest owners. This action is identical to what occurred under previous forest protection programs, such as *Program 661* (Huong *et al.*, 2014). This implies that payments were made based on participation of households in PFES schemes, rather than on performance of services provided by the forest (Phuc *et al.*, 2012). Second, the case studies reflect the low conditionality feature of PFES, where the collection of the PFES fee is independent of the actual performance of forest protection on the ground. This lack of conditionality might hamper the effectiveness of the *PFES Program* (Thuy *et al.*, 2013). This conforms with arguments of other scholars regarding the relative weak ability of guaranteeing payment conditionality in government-led PES programs (Corbera *et al.*, 2009). Third, neither buyers/users nor suppliers voluntarily enter into a PFES contract and the current rates were not established based on a willingness to accept responsibility by forest communities and therefore do not reflect opportunity costs (Wunder, 2005; Catacutan *et al.*, 2011). In general, PFES in Vietnam is argued to serve the role of “performance-based forest-ranger salaries” (Wunder, 2005). However, an approach that combines PES and more traditional command-and-control tools might be the most suitable option for Vietnam’s *PFES Program* (*ibid.*). Nevertheless, PFES has proved to perform better than previous forest protection programs because of its inclusion of commercial forests into the payments, which has brought more benefits to farmers.

Regarding institutional performance, the overall goal of the *PFES Program* examined in our study has not been developed and there are no specific objectives or targets at the central and provincial levels. This means that the program lacks strategic management. This hinders the assessment of the institutional performance of the program since it is unknown whether the program’s objectives were achieved. Current institutional arrangements, namely, the weak monitoring and evaluation of land user’s compliance on the ground and a strict benefit sharing mechanism that induced farmers to act as forest rangers rather than real forest owners, do not ensure the additionality of the *PFES Program* in the long-term due to existing threats to forests, especially natural forests.

According to PFES regulations, the number of forest owners is always the same as the number of PFES recipients, but this is not always the case. At the local-level, each household receives the same amount of PFES payments regardless of whether the household owns forest land or not. Although this method of distributing payments resulted in dissatisfaction of forest land owners, we argue that this method helped avoid many potential negative consequences for the community and implementing agencies (see [Section 4.3.3.4](#) for more detail). These negative consequences include increased time and effort for conflict resolution and for determining of the real forest land holders, given the complexity of *de jure* and *de facto* forest land ownership. In addition, this method ensures that payments reach the poor, particularly newly established households and migrants who lack access to

land and who are dependent on forest land and forest resources. Furthermore, since all individuals within communities receive PFES payments, they must be held accountable for their actions toward forest conservation by their internal government (Alix-Garcia *et al.*, 2009). We believe that as long as payments are distributed equally for protecting forests regardless of who the actual owners are, forests will continue to be protected.

The allocation of the administration fee is a common issue for implementing forestry programs. The design of PFES, similar to *Program 661*, does not provide an administration fee to village headmen or the commune government, despite their being key facilitators of the program on the ground. As a result, they deduct a proportion of PFES payments for themselves, even though the payments are meant to be given to forest owners.

From an institutional interplay perspective, the findings show that the *PFES Program* mainly complements other institutions at national and local-levels. The program is especially compatible with the objectives of the national *Forestry Development Strategy 2006-2020*. Although incompatibilities exist in terms of customary practices (e.g., swidden cultivation among the Dao ethnic group), it is unlikely that these will become an institutional conflict.

Getting services users in intra-provincial watersheds involved in PFES payments is always the target of provincial authorities. However, this achievement would result in disputes and complaints due to different payments per ha given to farmers for identical performance on forest protection (i.e., as the number of services users who share a watershed increases, the amount of PFES money and payment levels per hectare of forest protection increases). Similarly, farmers in PFES areas receive money for forest protection, while farmers in non-PFES areas do not (due to a lack of budget in *Plan 57*). This comparison might produce complaints among local people, result in potential threats of deforestation in non-PFES areas, and further expand threats to the forest in PFES areas due to neighboring effects. All of these potential consequences might require increased efforts to explain to farmers the nature of PFES or to undertake more conflict resolution. In this regard, we argue that *Plan 57*'s budget should focus on forest protection in non-PFES areas to mitigate the potential conflicts, instead of focusing on the insufficient investment into afforestation. First, authorities reported that “*suitable areas for trees plantation are already occupied and the rest are either inaccessible or degraded, which is unattractive for commercial forest*” (DFD_6_1). This means that the development of commercial forest is primarily based on reforestation rather than on afforestation. Second, farmers are aware that they can receive a seedling subsidy just once. In other words, they have to reforest with their own capital, which is mainly from selling products from the previous harvest. Third, reforestation after the first reforestation is facilitated by the self-growing ability of trees that are commonly found on the ground, such as acacia.

The study shows that while the design of operating rules is a top-down process, enforcement rules are a bottom-up process: Local institutions have developed and applied regulations, while the central-level has not. In this regard, the compliance of PFES payment contracts on the ground is enforced from community institutions, not from the central government. The deduction of PFES payments based on the degree of the violation is an effective tool, especially given that payments are distributed before the New Year holiday. The effectiveness of this rule is further enhanced in communities where PFES payments are larger than payments from previous forest protection programs since farmers can use the larger amount of money for large investments.

Of the four services covered by *Decree 99*, arrangements are the most advanced component under its watershed protection services. Carbon sequestration, spawning in coastal fisheries, and aquaculture services are still in their development stage. The study has shown that carbon sequestration services would be dealt with under the framework of Program REDD+, in which payments for carbon sequestration comply with the general of *Decree 99*. Program REDD+ would contribute more funding to invest in forest protection and development, yet it would also require its design to conform to international regulations. This would be challenging given the lack of data, inconsistencies and unreliability of the data, and the poor capacity of government agencies to meet the essential requirements of undertaking such services. In addition, the development of Program REDD+ has come to a standstill as it remains unclear how it will operate and how payments will be collected and distributed, despite the framework of Program REDD+ being approved in 2012 (Thuy *et al.*, 2013).

The interaction between *Program 672* and the FLA, in which the consequences of the latter have been partly addressed by the former, has facilitated the performance of PFES implementing agencies and farmers. On the other hand, *Program 672* legalized use rights of communities to natural forests, through which natural forest plots, which were given to individual farmers in 1994 and 1995, were re-allocated officially to entire communities. Nevertheless, the legal document (the Red Book) has not yet been delivered to communities. This means that the mistake of the FLA in allocating natural forests to individual households has been corrected (as regulated under the *Law of Forest Protection and Development 2004*, barren forest land is allocated to households and forest land covered by natural forest is managed by state bodies or the entire community). Broadly speaking, this reform does not bring much change to the entire community. In fact, the self-development of community-based natural forest management (i.e., villagers have agreed to manage natural forest plots given to particular farmers by the whole community) began prior to *Program 672*. This supports collective activities regarding forest conservation (e.g., the involvement of every community member in helping out with forest fires, detecting offenders, and benefiting from timber extraction for building new houses) and also conforms to the strict benefit-sharing policy applied to natural forests, in which farmers are not allowed to extract timber except when collecting NTFPs (Huong *et al.*, 2014). Nevertheless, this reform means that former owners of natural forest plots do not necessarily remain

fearful of sharing their forest land with others. In addition, dissatisfaction about the equal distribution of PFES money should be limited to commercial forests only because natural forests are no longer given to individuals. This change requires a lot of effort to be properly explained to farmers. Finally, *Program 672* is not the panacea for all of the consequences of the FLA, such as fragmentation of forest land and the large number of small forest land holders which challenges not only PFES, but future forestry programs as well.

4.5 CONCLUSIONS AND POLICY IMPLICATIONS

This study has provided additional empirical evidence to the growing literature on PES. Our analyses include institutional interplay, which is the least researched area in the PES field (Corbera *et al.*, 2009). The study examines institutional dimensions of PFES in Vietnam, using Hoa Binh province as a case study. We argue that it would be premature to proceed with a comprehensive assessment of the program, since its implementation began in 2011. This study found several interesting results of the program so far. First, the PFES model was initiated by foreign donors, but is controlled by the central government. PFES emerged to address a shortage in the government's budget for forest protection and development, as well as to address deforestation and the degraded environment. Second, the design segment at the central-level is incomplete, especially given the lack of clear indicators of environmental service performance and enforcement rules, which has led to poor monitoring at the local-level. The design of the government-led scheme has enhanced the sustainability of environmental service financing rather than program's performance itself. Third, there has been additionality in both planted and natural forests, but higher additionality in natural forest will be threatened in the near future if there is not a good monitoring and benefit sharing mechanism. Fourth, the implementation of the program has resulted in benefits, such as better economic gains, a growing awareness of environmental values, and a higher commitment to forest protection, yet there have also been several negative consequences, such as the lack of agricultural land, discouragement of livestock development, and complaints and disputes among villagers. Fifth, the study shows that PFES has complemented other institutional arrangements in which local institutions have considerably helped enforce PFES. Overall, PFES is more meaningful to the poor and in remote areas where there is little chance for off-farm employment. Furthermore, payments from PFES are more significant in places where there is a higher average amount of forest land per household. An official provided his concluding thoughts on the effects of PFES in Hoa Binh province, saying, "*PFES coverage includes four districts and a little area inside Hoa Binh city out of ten districts in the province. Among localities implementing PFES, the program is likely significant to Da Bac – which contains the most remote areas. In Cao Phong district, for example, farmers are not eager for PFES because one can work as an orange picker and earn 100,000 VND (US\$ 3.9) per day, while efforts spent on forest protection of one hectare per year provides a similar amount of money*" (MB2_6_2).

The *PFES Program* is not a one-size-fits-all solution for conservation, primarily because it does not yet have sufficient mechanisms to tackle the underlying drivers of deforestation (Pagiola, 2008; McElwee, 2012). There is the need to involve several programs across various sectors simultaneously to mitigate pressure on forests. However, the socio-economic and cultural conditions of the localities need to be taken into consideration. The inclusion of sustainable finance and the promotion of an effective service supply, good governance, strong institutions (law enforcement, monitoring and control, etc.), and civil society participation are general preconditions for successful environmental management and are not specific to a particular PFES scheme (Wertz-Kanounnikoff and Rankine, 2008). In the future, a more thorough assessment of the program based on qualitative and quantitative data could be conducted.

4.6 REFERENCES

- ADB, 2014. Scaling up payments for forest environmental services in Vietnam: Lessons and insights from Quang Nam. Mandaluyong, Philippines.
- Alix-Garcia, J., De Janvry, A., Sadoulet, E., Manuel, J., 2009. Lessons learned from Mexico's payment for environmental services program. *Payment for Environmental Services in Agricultural Landscapes*. Springer, pp. 163-188.
- Bac, D.V., Catacutan, D.C., Ha, H.M., 2014. Importance of national policy and local interpretation in designing payment for forest environmental services scheme for the Ta Leng river basin in Northeast Vietnam. *Environment and Natural Resources Research* 4 (1), 39-53.
- Catacutan, D.C., Ha, H.M., Sen, H., Luan, T.D., 2011. Moving beyond pilots: A review of lessons learnt in payments for forest ecosystem services (PFES) in Vietnam. World Agroforestry Center.
- Corbera, E., Kosoy, N., Tuna, M.M., 2007. Equity implications of marketing ecosystem services in protected areas and rural communities: Case studies from Meso-America. *Global Environmental Change* 17 (3), 365-380.
- Corbera, E., Soberanis, C.G., Brown, K., 2009. Institutional dimensions of payments for ecosystem services: An analysis of Mexico's carbon forestry programme. *Ecological Economics* 68 (3), 743-761.
- Da Bac District Department of Agriculture and Rural Development, 2011. Report No. 231/BC-NN&PTNT dated November 1, 2011 of the Head on district's agriculture and forestry production in 2011. Da Bac district People's committee, Hoa Binh, Vietnam.
- Engel, S., Pagiola, S., Wunder, S., 2008. Designing payments for environmental services in theory and practice: An overview of the issues. *Ecological Economics* 65 (4), 663-674.
- Farley, J., Costanza, R., 2010. Payments for ecosystem services: From local to global. *Ecological Economics* 69 (11), 2060-2068.

- Gómez-Baggethun, E., Muradian, R., 2015. In markets we trust? Setting the boundaries of market-based instruments in ecosystem services governance. *Ecological Economics* 117 (September 2015), 217-224.
- Government of Vietnam, 1994. Decree No. 02/1994/ND-CP dated January 15, 1994 of the Government on regulations on allocating forest land to organizations, households and individuals for stable, long-term use in forestry purposes. Ha Noi, Vietnam.
- Government of Vietnam, 2006. Decision No. 672/QĐ-TTg dated April 28, 2006 of the Prime Minister on the implementation of project on cadastral mapping, and project on issuance of the forest land use rights certificate in 8 provinces in the Northern mountainous areas and the North Central Coast, and in 9 provinces in the Central Coast and the Southeast. Ha Noi, Vietnam.
- Government of Vietnam, 2007. Decision No. 18/2007/QĐ-TTg dated February 5, 2007 of the Prime Minister on Vietnam forestry development strategy 2006-2020. Ha Noi, Vietnam.
- Government of Vietnam, 2008a. Decision No. 380/QĐ-TTg dated April 10, 2008 of the Prime Minister on payments for forest environmental services. Ha Noi, Vietnam.
- Government of Vietnam, 2008b. Decree No. 05/2008/ND-CP dated January 14, 2008 of the Government on Forest protection and development funds. Ha Noi, Vietnam.
- Government of Vietnam, 2010. Decree No. 99/2010/ND-CP dated September 24, 2010 of the Government on policy for payments for forest environmental services. Ha Noi, Vietnam.
- Government of Vietnam, 2012a. Decision No.57/QĐ-TTg dated January 9, 2012 of the Prime Minister on forest protection and development plan 2011-2020. Ha Noi, Vietnam.
- Government of Vietnam, 2012b. Decision No. 799/QĐ-TTg dated June 27, 2012 of the Prime Minister on national action plan for REDD+, 2011-2020. Ha Noi, Vietnam.
- Hoa Binh Forest Protection and Development Fund, 2013. Report [no number] dated December 31, 2013 by the Director on the implementation of the payments for forest environmental services program in 2013. Hoa Binh, Vietnam.
- Hoa Binh Provincial People's Committee, 2011a. Decision No. 2234/QĐ-UBND dated November 16, 2011 of the Chairman on establishing provincial steering committee for the implementation of the payments for forest environmental services program in Hoa Binh province. Hoa Binh, Vietnam.
- Hoa Binh Provincial People's Committee, 2011b. Decision No. 2642/QĐ-UBND dated December 31, 2011 of the Chairman on the establishment of Hoa Binh Forest Protection and Development Fund. Hoa Binh, Vietnam.
- Hoa Binh Provincial People's Committee, 2012. Decision No. 1904/QĐ-UBND dated December 12, 2012 of the Chairman on K-coefficient in the implementation of the payments for forest environmental services program in Hoa Binh province. Hoa Binh, Vietnam.
- Hoa Binh Provincial People's Committee, 2013a. Decision No. 155/QĐ-UBND dated February 6, 2013 of the Chairman on approving the proposal to implement the payments for forest

- environmental services program in the watershed of Hoa Binh hydropower plant. Hoa Binh, Vietnam.
- Hoa Binh Provincial People's Committee, 2013b. Decision No. 396 dated April 5, 2013 of the Chairman on the services users and the level of payment. Hoa Binh, Vietnam.
- Hoa Binh Provincial People's Committee, 2013c. Decision No. 2008/QD-UBND dated August 23, 2013 of the Chairman on the implementation of payments for forest environmental services in the watershed of Hoa Binh hydropower plant. Hoa Binh, Vietnam.
- Hoa Binh Provincial People's Committee, 2013d. Document No. 578/UBND-NNTN dated June 19, 2013 of the Chairman on project on afforestation and protection of the headwater protection forest in the Da river reservoir in 2015-2020. Hoa Binh, Vietnam.
- Hoa Binh Provincial Union of Science and Technology Associations, 2010. The livelihood of the local people after 30 years in the resettlement region along the Da river. Proceedings of the workshop on Effectiveness of state policies on the lives of resettled people in the resettlement region along the Da river, Hoa Binh, Vietnam.
- Huong, T.T.T., Zeller, M., Hoanh, C.T., 2014. The 'Five Million Hectare Reforestation Program' in Vietnam: An analysis of its implementation and transaction costs, a case study in Hoa Binh province. *Quarterly Journal of International Agriculture* 53(4): 341-375.
- Legrand, T., Froger, G., Le Coq, J.-F., 2013. Institutional performance of payments for environmental services: An analysis of the Costa Rican program. *Forest Policy and Economics* 37 (December 2013), 115-123.
- Ly, N.T.Y., 2013. Evaluating the pilot implementation of payment for forest environmental services in Lam Dong, Vietnam. *Economy and Environment Program for Southeast Asia (EEPSEA)*. Tanglin, Singapore.
- MARD, 2012a. Circular No.20/2012/TT-BNNPTNT dated May 7, 2012 of the Minister on procedures for verification of forest protection performance and making payments for forest environmental services. Ha Noi, Vietnam.
- MARD, 2012b. Decision No. 3003/QD-BNN-TCLN dated November 29, 2012 of the Minister on the declaration of forest areas in the watersheds covering territory in two or more provinces as the basis for policy on payments for forest environmental services. Ha Noi, Vietnam.
- MARD, 2012c. Forest sector development report 2011: Serving FSSP annual plenary meeting, 1 March 2012. Ha Noi, Vietnam.
- MARD, 2013. Decision No. 2092/QD-BNN-TCLN dated September 12, 2013 of the Minister on adjustment of respective forest areas belonging to Hoa Binh province in the watershed of Hoa Binh hydropower plant. Ha Noi, Vietnam.
- McElwee, P.D., 2012. Payments for environmental services as neoliberal market-based forest conservation in Vietnam: Panacea or problem? *Geoforum* 43 (3), 412-426.

- Meshack, C.K., Ahdikari, B., Doggart, N., Lovett, J.C., 2006. Transaction costs of community-based forest management: Empirical evidence from Tanzania. *African Journal of Ecology* 44 (4), 468-477.
- Muradian, R., Corbera, E., Pascual, U., Kosoy, N., May, P.H., 2010. Reconciling theory and practice: An alternative conceptual framework for understanding payments for environmental services. *Ecological Economics* 69 (6), 1202-1208.
- Muradian, R., Martinez-Tuna, M., Kosoy, N., Perez, M., Martinez-Alier, J., 2008. Institutions and the performance of payments for water-related environmental services. Lessons from Latin America. Development Research Institute, Tilburg University. Tilburg, Netherlands.
- Naeem, S., Ingram, J., Varga, A., Agardy, T., Barten, P., Bennett, G., Bloomgarden, E., Bremer, L., Burkill, P., Cattau, M., 2015. Get the science right when paying for nature's services. *Science* 347 (6227), 1206-1207.
- Nga, D.T., 2014a. Payments for forest environmental services in Vietnam: Historical development and challenges. Presentation to a workshop on "Challenges in benefit sharing and livelihood improvement with water storage development", Vientiane, Lao PDR.
- North, D.C., 1990. Institutions, institutional change and economic performance. Cambridge University Press, Cambridge, United Kingdom.
- Pagiola, S., 2008. Payments for environmental services in Costa Rica. *Ecological Economics* 65 (4), 712-724.
- Peters, J., 2008. The pilot payments for forest environmental services policy in Vietnam and PES pilot sites in the Dong Nai river basin., Presentation to IWLEARN regional workshop on payments for environmental services, Ha Noi, Vietnam.
- Phuc, T.X., Dressler, W.H., Mahanty, S., Thuy, P.T., Zingerli, C., 2012. The prospects for payment for ecosystem services (PES) in Vietnam: A look at three payment schemes. *Human Ecology* 40 (2), 237-249.
- Porras, I.T., Grieg-Gran, M., Neves, N., 2008. All that glitters: A review of payments for watershed services in developing countries. International Institute for Environment and Development (IIED).
- Prokofieva, I., Gorriz, E., 2013. Institutional analysis of incentives for the provision of forest goods and services: An assessment of incentive schemes in Catalonia (north-east Spain). *Forest Policy and Economics* 37 (December 2013), 104-114.
- Sommerville, M.M., Jones, J.P., Milner-Gulland, E., 2009. A revised conceptual framework for payments for environmental services. *Ecology and Society* 14 (2), 34.
- Suhardiman, D., Wichelns, D., Lestrelin, G., Hoanh, C.T., 2013. Payments for ecosystem services in Vietnam: Market-based incentives or state control of resources? *Ecosystem Services* 6 (September 2013), 64-71.

- Tan, N.Q., 2011. Payment for environmental services in Vietnam: An analysis of the pilot project in Lam Dong province. Institute for Global Environmental Strategies (IGES). Hayama, Japan.
- Thuy, P.T., Bennett, K., Phuong, V.T., Brunner, J., Dung, L.N., Tien, N.D., 2013. Payments for forest environmental services in Vietnam: From policy to practice. Occasional Paper 93. Center for International Forestry Research. Bogor, Indonesia.
- Thuy, P.T., Moeliono, M., Hien, N.T., Tho, N.H., Hien, V.T., 2012. The context of REDD+ in Vietnam: Drivers, agents and institutions. Center for International Forestry Research. Bogor, Indonesia.
- Vatn, A., 2010. An institutional analysis of payments for environmental services. *Ecological Economics* 69 (6), 1245-1252.
- Vatn, A., Barton, D., Lindhjem, H., Movik, S., Ring, I., Santos, R., 2011. Can markets protect biodiversity? An evaluation of different financial mechanisms. Department of International Environment and Development Studies, Noragric. Norwegian University of Life Sciences, Norway. Naragric Report.
- Vietnam National Assembly, 2004. Forest Protection and Development Law 2004. Ha Noi, Vietnam.
- Vietnam National Assembly, 2008. Biodiversity Law 2008. Ha Noi, Vietnam.
- VNFF, 2013. Proceedings workshop on payment for forest environmental services in Vietnam - Status and solutions. Ha Noi, Vietnam.
- VNFF, 2014a. Payments for forest environmental services (PFES) in Vietnam: Findings from three year of implementation. Vietnam Forest Protection and Development Fund. Available at http://www.cifor.org/publications/pdf_files/factsheet/5066-factsheets.pdf [Accessed 15.1.2016]. Ha Noi, Vietnam.
- VNFF, 2014b. Report [no number] on the implementation of the payments for forest environmental services program in 2013 and on planning for the implementation in 2014. Ha Noi, Vietnam.
- Wertz-Kanounnikoff, S., Rankine, H., 2008. How can governments promote strategic approaches to payments for environmental services (PES). An exploratory analysis for the case of Vietnam. The Institute for Sustainable Development and International Relations (IDDRI) Paris, France.
- Winrock International, 2011. Payment for forest environmental services: A case study on pilot implementation in Lam Dong province, Vietnam from 2006 to 2010. Little Rock, USA.
- Wunder, S., 2005. Payments for environmental services: Some nuts and bolts. Occasional Paper No. 42. Center for International Forestry Research. Bogor, Indonesia.
- Wunder, S., 2015. Revisiting the concept of payments for environmental services. *Ecological Economics* 117 (September 2015), 234-243.

CHAPTER 5

CONCLUSIONS

After decades of policies favoring centralization, Vietnam is currently moving towards decentralization in the forestry sector. This shift began with providing incentives for allocating and/or leasing forest and forest land to state- and non-state stakeholders for long-term management and recognized the role of local farmers and communities in natural resources management. Along with forest land allocation, the government has also implemented various nationwide reforestation, afforestation, and forest protection programs since the 1990s with the purpose of providing more incentives to encourage farmers to participate in forest conservation activities. This dissertation aims to analyze the implementation of current national forestry policies through an institutional approach and to propose an innovative way to improve these programs' administrative and transaction cost aspects. A greater understanding of how these policies are implemented at the local-level and how they affect local forest management efforts, as well as the role of stakeholders is crucial to provide insights and policy recommendations for future forest conservation policies.

5.1 SUMMARY OF THE MAIN RESULTS

The first study in Chapter 2 examines the implementation of the *Five Million Hectare Reforestation Program* and the private transaction costs incurred by farmers when participating in the program. The study indicates that the implementation of the program employed a top-down process and was a cumbersome system that operated from the executive level all the way down to operational levels. Our results reveal that farmers participated in the program mainly due to government subsidies, despite lots of criticism about the low-level of subsidies. We found that not all farmers had an equal opportunity to participate in the program. Characteristics in remote areas, such as long distances to local markets, difficult access, and poor awareness among local people, led to high transaction costs for implementing agencies when delivering seedlings and implementing follow-up project activities. This discouraged management boards from implementing the program. Implementing agencies paid less attention to their responsibilities in regard to contract monitoring and verification on the ground, even though they received administrative fees for these activities. Under the program, local governments' contributions were not acknowledged and farmers acted as forest guards instead of forest owners since there were no rights for farmers to extract timber in natural forests and there were very limited rights for conflict resolution.

A transaction cost approach was applied in the quantification of the time and costs incurred by participating households. Our results show that there is a diversity of informal institutional

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arrangements for forest management, resulting in a large variation in transaction costs among communities. Under community contracts for forest conservation only, regular meetings and self-monitoring activities constituted the greatest proportion of total transaction costs. In the case of individual contracts for both planting and protecting new forests, the largest transaction cost was self-monitoring. The transaction costs per hectare per average year were relatively large for households with individual contracts due to the relatively small size of the forest areas that were planted and managed.

From a benefit viewpoint, participating in both the planting and protection of forests brought much greater benefits than only participating in protection. Although relatively high benefit-cost ratios were experienced under both types of contracts, the benefits mainly came from the collection and sale of non-timber forest products, not from the government subsidies. This finding contradicted the expectation that compensation payments should cover all extra costs borne by households for forest management activities to give households an incentive to work hard (e.g., Mettepenningen *et al.*, 2009). However, the government payment was not enough to cover the transaction costs incurred in some areas, particularly when the value of non-timber forest products was not taken into account. The calculation of the net present value of forest management activities per hectare per average year was higher for households under individual contracts than for those under community-based contracts. Moreover, the net present value per hectare per average year for those planting woody trees and bamboo was higher than for those planting woody trees and acacia. The main reason is that annual revenues from planting bamboo came from bamboo shoots and mature bamboo. These revenues could continue for more than ten years, while acacia can only be harvested once about nine years after their initial planting. This finding explains why most farmers we interviewed preferred bamboo over acacia. The main limitation of this study is that resource appropriation and production costs were not included in the analysis. The benefits given to households might have been lower if these costs had been taken consideration.

Chapter 3 examines the dual-functionality of state forest enterprises (SFEs) in the implementation of the *Payments for Forest Environmental Services Program*. Dual functions consist of environmental services providers in their own allocated forest land and intermediaries in *PFES Program* activities outside of their administrative areas. A review of the history of SFEs reveals that SFEs have played an important role in the forestry sector in Vietnam, despite criticism about their ineffective management prior to the 1990s. The results show that after the privatization reform, the main concerns of SFEs nationwide were high interest rates and the more stringent lending criteria imposed by banks, making access to finance difficult. The burden of high interest rates has been passed onto contracts with farmers, making it difficult for SFEs to recruit more farmers to agree to the conditions of forest management contracts. On the other hand, SFEs remained active in government programs such as *Programs 327* and *Program 661*. SFEs function as large forest owners and as government agencies

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contracting, directing, monitoring, and evaluating contract fulfillments with households in their areas. Moreover, the policy and legal frameworks of SFEs in Vietnam are conducive for SFEs to participate in and mediate PFES projects.

From an empirical analysis of Tu Ly SFE's operation and from the viewpoint of the acceptability and impacts of SFEs, we found three models that represent SFE involvement with local farmers: (i) hiring farmers to establish and manage the forest (i.e., labor contracts); (ii) contracting with households to plant commercial forests based on Tu Ly SFE's forest land (i.e., forest plantation contracts); and (iii) a mixture of the previous two models. There was a remarkable contribution from Tu Ly SFE to farmer's employment and thus economic situation. However, not all farmers had the same chance to participate in Tu Ly SFE's forest management programs as Tu Ly SFE favored some households over others. An emphasis on conservation and protection, as well as inflexible terms under the current contracts undermined Tu Ly SFE's engagement with farmers. From the administrative and transaction cost perspective, the study reveals that Tu Ly SFE had advantages over the other state bodies when implementing national forest management programs. Tu Ly SFE had: (i) fewer parties involved in managing and monitoring forestry programs; (ii) many years of specialized experience in forest management; (iii) greater autonomy and outreach in the district; and (iv) the ability to propagate seedlings in their nursery. These advantages are also considered to be primary elements that reduce the costs and enhance the financial sustainability of the *PFES Program*.

This study proposes the acknowledgment of SFEs as environmental service providers and to use SFEs as intermediaries for monitoring activities in the *PFES Program*, keeping in mind the disadvantages and challenges of relying on SFEs to monitor the *PFES Program*. A strong regulatory and monitoring framework is needed to avoid repeating historical problems with SFEs and to decrease the pressure on business-oriented SFEs to become financially independent, which may continue to drive SFEs to be more profitable and thus have less regard for forest protection. The government needs to continue to improve the legal framework by authorizing SFEs to operate in the hydropower watersheds as legal providers of environmental services. According to *Government Decree 99*, when SFEs act as large forest owners they are given the annual PFES' payment made by users of the environmental services. In addition, when SFEs act as intermediaries, they are provided 10% of the total payment given to service providers for their administrative activities. With the potential of PFES as an interest-free capital source, SFEs can reduce or remove interest rates on loans, which is critical for attracting more poor farmers to participate in forest management programs.

Chapter 4 analyzes the institutional dimensions, namely, the design, performance, and interplay, of the *PFES Program*. This study provided additional evidence to the growing literature on payments for environmental services (PES). Our analyses include institutional interplay, which is the least researched area in the PES field. From an institutional design perspective, the findings show that

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major factors for PFES in Vietnam were: (i) the central government which socialized the forestry sector, (ii) the shortage of government budget for forest protection and management, (iii) deforestation and environmental degradation, and (iv) timely international support. Similar to previous forestry programs, a top-down management approach was employed to implement the *PFES Program*. Incomplete design and shortcomings at the central-level resulted in poorer performance at lower levels. Several shortcomings of institutional design were identified. First, the provision of environmental services was evaluated based on forest cover, making PFES similar to former forest protection programs. Second, there was a low conditionality of PFES since the collection of the PFES' fee is independent of the actual performance of forest protection on the ground, which may hamper the effectiveness of the *PFES Program*. This finding conforms arguments of other scholars on the relative weak ability of guaranteeing payment conditionality in government-led PES programs (Corbera *et al.*, 2009). Third, neither buyers/users nor suppliers voluntarily participated in a PFES' contract and current rates are not calculated based on a willingness to accept responsibility by forest communities and therefore did not reflect opportunity costs. Fourth, there was a lack of enforcement rules introduced by the central-level, which impeded the performance of implementing agencies on the ground. However, the *PFES Program* has proved to perform better than previous forest protection programs because it involved commercial forests, which has brought more benefits to farmers.

From an institutional performance perspective, we found that PFES lacked strategic management as there were no specific objectives or targets at the central and provincial-levels, making it difficult to know whether the program's objectives were achieved. There was additionality in both planted and natural forests. Higher additionality in natural forests is possible threatened in the near future if there is a lack of a more comprehensive monitoring and benefit sharing mechanism. Under PFES, farmers acted as forest rangers rather than forest owners. The implementation of the program resulted in benefits, such as economic gains, a growing awareness of environmental values, and a higher commitment to forest protection. However, several negative consequences of the program were found, such as the lack of agricultural land, discouragement of livestock development, and complaints and disputes among villagers. The results from examining the institutional interplay of PFES indicate that the PFES' program mainly complements other institutions at the national- and local-level. Although incompatibilities exist in terms of customary practices, it is unlikely that these will become an institutional conflict.

Despite an important role of the transaction cost analysis when assessing the effectiveness of institutional arrangements within natural resource management, this type of analysis is often neglected in policy analysis. Therefore, the analysis of transaction costs borne by participating farmers under *Program 661* contributes to the small handful of empirical studies on private transaction costs associated with natural resource management activities. Moreover, proposing SFES to function as intermediaries in the implementation of the *PFES Program* contributes to the limited number of

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studies on innovative ways to reduce transaction costs of managing such program. In addition, the dissertation contributes empirical evidence on the institutional analysis of the PFES scheme. This topic has rarely been studied and the inclusion of institutional interplay is the least researched area in the literature. As Vietnam is the first country in the region to initiate the PFES scheme nationwide, the lessons learned from the design of the PFES scheme and from its implementation in the field are valuable to other developing countries with similar conditions.

5.2 POLICY IMPLICATIONS

There are several policy implications from this dissertation's research on the implementation of forestry policies. Despite a growing awareness of environmental values among farmers, the majority of local farmers participated in the government programs due to the monetary subsidy. In addition, the opportunity costs of forest management activities were not taken into account. The government should therefore increase payments given to participating farmers to strengthen their motivation towards sustainable forest management activities. The contributions of local governments under forest management schemes (e.g., *Program 661* and the *PFES Program*) have not yet been recognized. Thus, there is a need to empower local governments and communities by giving them more autonomy with respect to forest management. Given that poor performance at lower levels resulted from shortcomings in the PFES design, we recommend the inclusion of law enforcement, monitoring, and control in the design and that these are included soon. Moreover, a particular forestry policy/program, such as *Program 661* or the *PFES Program*, is certainly not a one-size-fits-all solution for forest conservation. It is necessary to simultaneously include several programs across various sectors to mitigate pressure on forests. The role of related information dissemination to gradually shift farmers' behavior towards the environment should not be forgotten. Although proposing that SFEs function as intermediaries in the *PFES Program* is not a novel idea, there is a need to avoid repeating historical problems with SFEs by strengthening an effective regulatory and monitoring framework. Furthermore, to achieve wider impact, regulations pertaining to acceptable terms and conditions of SFE contracts are imperative to encourage local participation. Future research should evaluate national forestry policies by examining public transaction costs faced by implementing agencies. This will allow a more comprehensive understanding of the effectiveness of forestry policies and programs and thus help the development of future policies and programs.

5.3 REFERENCES

Corbera, E., Soberanis, C.G., Brown, K., 2009. Institutional dimensions of payments for ecosystem services: An analysis of Mexico's carbon forestry programme. *Ecological Economics* 68 (3), 743-761.

CONCLUSIONS

Mettepenningen, E., Verspecht, A., van Huylenbroeck, G., 2009. Measuring private transaction costs of European agri-environmental schemes. *Journal of Environmental Planning and Management* 52 (5), 649-667.

GENERAL BIBLIOGRAPHY

- Abdullah, N.M.R., Kuperan, K., Pomeroy, R.S., 1998. Transaction costs and fisheries co-management. *Marine Resource Economics* 13 (2), 103-114.
- ADB, 2014. Scaling up payments for forest environmental services in Vietnam: Lessons and insights from Quang Nam. Mandaluyong, Philippines.
- Adhikari, B., Lovett, J.C., 2006. Transaction costs and community-based natural resource management in Nepal. *Journal of Environmental Management* 78 (1), 5-15.
- Agrawal, A., Ostrom, E., 2008. Decentralization and community-based forestry: Learning from experience. In: *Decentralization, forests and rural communities: Policy outcomes in South and Southeast Asia*. Webb E. L. and Shivakoti G. (Eds). SAGE Publications India. New Delhi, pp. 44-67.
- Alix-Garcia, J., De Janvry, A., Sadoulet, E., Manuel, J., 2009. Lessons learned from Mexico's payment for environmental services program. *Payment for Environmental Services in Agricultural Landscapes*. Springer, pp. 163-188.
- Arias, M.E., Cochrane, T.A., Lawrence, K.S., Killeen, T.J., Farrell, T.A., 2011. Paying the forest for electricity: A modelling framework to market forest conservation as payment for ecosystem services benefiting hydropower generation. *Environmental Conservation* 38 (4), 473-484.
- Arifin, B., 2006. Transaction cost analysis of upstream-downstream relations in watershed services: Lessons from community-based forestry management in Sumatra, Indonesia. *Quarterly Journal of International Agriculture* 45 (4), 361-376.
- Artemiev, I., 2003. State forestry enterprise reform in Vietnam: Unlocking the potential for commercial wood growing. Technical Note May 2003. World Bank. Washington D.C., USA.
- Bac, D.V., Catacutan, D.C., Ha, H.M., 2014. Importance of national policy and local interpretation in designing payment for forest environmental services scheme for the Ta Leng river basin in Northeast Vietnam. *Environment and Natural Resources Research* 4 (1), 39-53.
- Blore, M.L., Cundill, G., Mkhulisi, M., 2013. Towards measuring the transaction costs of co-management in Mkambati Nature Reserve, Eastern Cape, South Africa. *Journal of Environmental Management* 129 (15 November 2013), 444-455.
- Bulte, E.H., Lipper, L., Stringer, R., Zilberman, D., 2008. Payments for ecosystem services and poverty reduction: Concepts, issues, and empirical perspectives. *Environment and Development Economics* 13 (3), 245-254.
- Catacutan, D.C., Ha, H.M., Sen, H., Luan, T.D., 2011. Moving beyond pilots: A review of lessons learnt in payments for forest ecosystem services (PFES) in Vietnam. World Agroforestry Center.

GENERAL BIBLIOGRAPHY

- Chambers, R., 1994. The origins and practice of participatory rural appraisal. *World Development* 22 (7), 953-969.
- CIFOR, 2013. Rewarding the upland poor for environmental services: An innovative strategy to reward Asia's upland poor for preserving and improving our environment. World Agroforestry Center. Bogor, Indonesia.
- Clement, F., Amezaga, J.M., 2009. Afforestation and forestry land allocation in Northern Vietnam: Analysing the gap between policy intentions and outcomes. *Land Use Policy* 26 (2), 458-470.
- Clement, F., Orange, D., Williams, M., Mulley, C., Epprecht, M., 2009. Drivers of afforestation in Northern Vietnam: Assessing local variations using geographically weighted regression. *Applied Geography* 29 (4), 561-576.
- Clements, T., John, A., Nielsen, K., An, D., Tan, S., Milner-Gulland, E., 2010. Payments for biodiversity conservation in the context of weak institutions: Comparison of three programs from Cambodia. *Ecological Economics* 69 (6), 1283-1291.
- Coase, R.H., 1960. The problem of social cost. *Journal of Law and Economics* 3, 1-44.
- Coi, L.K., 2012. Forest governance monitoring in Vietnam. Workshop on forest governance assessment and monitoring, Ha Noi, Vietnam.
- Corbera, E., Kosoy, N., Tuna, M.M., 2007. Equity implications of marketing ecosystem services in protected areas and rural communities: Case studies from Meso-America. *Global Environmental Change* 17 (3), 365-380.
- Corbera, E., Soberanis, C.G., Brown, K., 2009. Institutional dimensions of payments for ecosystem services: An analysis of Mexico's carbon forestry programme. *Ecological Economics* 68 (3), 743-761.
- Da Bac District Department of Agriculture and Rural Development, 2011. Report No. 231/BC-NN&PTNT dated November 1, 2011 of the Head on district's agriculture and forestry production in 2011. Da Bac district People's committee, Hoa Binh, Vietnam.
- Dang, N.V., 2001. *Lâm nghiệp Việt Nam 1945-1950 (Vietnam forestry 1945-1950)*. Ha Noi Agriculture Publishing House. Ha Noi, Vietnam.
- de Jong, W., Sam, D.D., Hung, T.V., 2006. *Forest rehabilitation in Vietnam: Histories, realities and future*. Center for International Forestry Research. Bogor, Indonesia.
- Dung, N.T., Webb, E.L., 2008. Incentives of the forest land allocation process: Implications for forest management in Nam Dong district, Central Vietnam. In: *Decentralization, forests and rural communities: Policy outcomes in South and Southeast Asia*. Webb E. L. and Shivakoti G. (Eds). SAGE Publications India. New Delhi, pp. 269-291.
- Dunn, H., 2011. *Payments for ecosystem services. Evidence and analysis series*. Department for Environment, Food and Rural Affairs, London.
- EASRD, 2005. *State forest enterprise reform in Vietnam. Technical Note*. World Bank. Washington D.C., USA.

GENERAL BIBLIOGRAPHY

- Ecosystem Marketplace, 2008. Payments for ecosystem services: Market profiles. Forest Trends and Ecosystem Marketplace, Washington, DC, USA.
- Engel, S., Pagiola, S., Wunder, S., 2008. Designing payments for environmental services in theory and practice: An overview of the issues. *Ecological Economics* 65 (4), 663-674.
- Enters, T., Durst, P.B., Victor, M., (eds), 2000. Decentralization and devolution of forest management in Asia and the Pacific. The Center for People and Forests (RECOFTC), report No.18 and RAP Publication 2000/1. Bangkok, Thailand.
- Falconer, K., 2000. Farm-level constraints on agri-environmental scheme participation: A transactional perspective. *Journal of Rural Studies* 16 (3), 379-394.
- Falconer, K., Saunders, C., 2002. Transaction costs for SSSIs and policy design. *Land Use Policy* 19 (2), 157-166.
- Falconer, K., Whitby, M., 1999. The invisible costs of scheme implementation and administration. *Countryside Stewardship: Farmers, policies and markets*. Kidlington, Oxford: Elsevier Science Ltd, 67-88.
- FAO, 2001. Global forest resources assessment 2000: Main report. FAO Forestry Paper No. 140. Rome. Italy.
- FAO, 2007. The state of food and agriculture: Paying farmers for environmental services. FAO Agricultural Series No. 38. Rome. Italy.
- FAO, 2009. Vietnam forestry outlook study. Working paper No. APFSOS II/WP/2009/09. Bangkok, Thailand.
- Farley, J., Costanza, R., 2010. Payments for ecosystem services: From local to global. *Ecological Economics* 69 (11), 2060-2068.
- Foundjem Tita, D., D'Haese, M., Degrande, A., Tchoundjeu, Z., Van Damme, P., 2011. Farmers' satisfaction with group market arrangements as a measure of group market performance: A transaction cost analysis of non timber forest products' producer groups in Cameroon. *Forest Policy and Economics* 13 (7), 545-553.
- Gauvin, C., Uchida, E., Rozelle, S., Xu, J., Zhan, J., 2010. Cost-effectiveness of payments for ecosystem services with dual goals of environment and poverty alleviation. *Environmental Management* 45 (3), 488-501.
- General Statistics Office of Vietnam, 2015. Area, population and population density in 2013 by province [Online]. Available at: <https://www.gso.gov.vn/default.aspx?tabid=714> [Accessed: November 13, 2015].
- Gómez-Baggethun, E., Muradian, R., 2015. In markets we trust? Setting the boundaries of market-based instruments in ecosystem services governance. *Ecological Economics* 117 (September 2015), 217-224.

GENERAL BIBLIOGRAPHY

- Government of Vietnam, 1994. Decree No. 02/1994/ND-CP dated January 15, 1994 of the Government on regulations on allocating forest land to organizations, households and individuals for stable, long-term use in forestry purposes. Ha Noi, Vietnam.
- Government of Vietnam, 1998. Decision No. 661/QD-TTg dated July 29, 1998 of the Prime Minister on objectives, tasks, policies and implementation arrangements for the Five Million Hectare Reforestation Program. Ha Noi, Vietnam.
- Government of Vietnam, 2001. Decision No. 178/QD-TTg dated November 12, 2001 of the Prime Minister on entitlements and obligations of individuals and households allocated or leased with forest or forest land. Ha Noi, Vietnam.
- Government of Vietnam, 2006. Decision No. 672/QD-TTg dated April 28, 2006 of the Prime Minister on the implementation of project on cadastral mapping, and project on issuance of the forest land use rights certificate in 8 provinces in the Northern mountainous areas and the North Central Coast, and in 9 provinces in the Central Coast and the Southeast. Ha Noi, Vietnam.
- Government of Vietnam, 2007. Decision No. 18/2007/QD-TTg dated February 5, 2007 of the Prime Minister on Vietnam forestry development strategy 2006-2020. Ha Noi, Vietnam.
- Government of Vietnam, 2008a. Decision No. 380/QD-TTg dated April 10, 2008 of the Prime Minister on payments for forest environmental services. Ha Noi, Vietnam.
- Government of Vietnam, 2008b. Decree No. 05/2008/ND-CP dated January 14, 2008 of the Government on Forest protection and development funds. Ha Noi, Vietnam.
- Government of Vietnam, 2010. Decree No. 99/2010/ND-CP dated September 24, 2010 of the Government on policy for payments for forest environmental services. Ha Noi, Vietnam.
- Government of Vietnam, 2011. Decision No. 09/2011/QD-TTg dated January 30, 2011 of the Prime Minister on poverty line in 2011-2015. Ha Noi, Vietnam.
- Government of Vietnam, 2012a. Decision No.57/QD-TTg dated January 9, 2012 of the Prime Minister on forest protection and development plan 2011-2020. Ha Noi, Vietnam.
- Government of Vietnam, 2012b. Decision No. 799/QD-TTg dated June 27, 2012 of the Prime Minister on national action plan for REDD+, 2011-2020. Ha Noi, Vietnam.
- Hanna, S., 1995. Efficiencies of user participation in natural resource management. In: Hanna, S., Munasinghe, M., Property rights and the environment: Social and ecological issues. The Beijer International Institute of Ecological Economics and The World Bank, Washington , D.C., 59-67.
- Hoa Binh Forest Protection and Development Fund, 2013. Report [no number] dated December 31, 2013 by the Director on the implementation of the payments for forest environmental services program in 2013. Hoa Binh, Vietnam.
- Hoa Binh Provincial People's Committee, 2011a. Decision No. 2234/QD-UBND dated November 16, 2011 of the Chairman on establishing provincial steering committee for the implementation of

GENERAL BIBLIOGRAPHY

- the payments for forest environmental services program in Hoa Binh province. Hoa Binh, Vietnam.
- Hoa Binh Provincial People's Committee, 2011b. Decision No. 2642/QD-UBND dated December 31, 2011 of the Chairman on the establishment of Hoa Binh Forest Protection and Development Fund. Hoa Binh, Vietnam.
- Hoa Binh Provincial People's Committee, 2012. Decision No. 1904/QD-UBND dated December 12, 2012 of the Chairman on K-coefficient in the implementation of the payments for forest environmental services program in Hoa Binh province. Hoa Binh, Vietnam.
- Hoa Binh Provincial People's Committee, 2013a. Decision No. 155/QD-UBND dated February 6, 2013 of the Chairman on approving the proposal to implement the payments for forest environmental services program in the watershed of Hoa Binh hydropower plant. Hoa Binh, Vietnam.
- Hoa Binh Provincial People's Committee, 2013b. Decision No. 396 dated April 5, 2013 of the Chairman on the services users and the level of payment. Hoa Binh, Vietnam.
- Hoa Binh Provincial People's Committee, 2013c. Decision No. 2008/QD-UBND dated August 23, 2013 of the Chairman on the implementation of payments for forest environmental services in the watershed of Hoa Binh hydropower plant. Hoa Binh, Vietnam.
- Hoa Binh Provincial People's Committee, 2013d. Document No. 578/UBND-NNTN dated June 19, 2013 of the Chairman on project on afforestation and protection of the headwater protection forest in the Da river reservoir in 2015-2020. Hoa Binh, Vietnam.
- Hoa Binh Provincial Union of Science and Technology Associations, 2010. The livelihood of the local people after 30 years in the resettlement region along the Da river. Proceedings of the workshop on Effectiveness of state policies on the lives of resettled people in the resettlement region along the Da river, Hoa Binh, Vietnam.
- Huong, T.T.T., Zeller, M., Hoanh, C.T., 2014. The 'Five Million Hectare Reforestation Program' in Vietnam: An analysis of its implementation and transaction costs, a case study in Hoa Binh province. *Quarterly Journal of International Agriculture* 53(4): 341-375.
- Kile, G., Booth, T., Cromer, R., Marcar, N., Myers, B., Polglase, P., 1998. The role of plantations and farm forests in sustainable land management. En: *Boosting International Competitiveness in the Australian Timber and Forestry Industry*. AIC Conference, Sydney.
- Kronenberg, J., Hubacek, K., 2013. Could payments for ecosystem services create an “ecosystem service curse”. *Ecology and Society* 18 (1), 10.
- Kuperan, K., Raja Abdullah, N.M., Pomeroy, R.S., Genio, E.L., Salamanca, A.M., 2008. Measuring transaction costs of fisheries co-management. *Coastal Management* 36 (3), 225-240.
- Landell-Mills, N., Porrás, I.T., 2002. Silver bullet or fools' gold?: A global review of markets for forest environmental services and their impact on the poor. International Institute for Environment and Development. London, UK. .

GENERAL BIBLIOGRAPHY

- Leffler, K.B., Rucker, R.R., 1991. Transactions costs and the efficient organization of production: A study of timber-harvesting contracts. *Journal of Political Economy* 99 (5), 1060-1087.
- Legrand, T., Froger, G., Le Coq, J.-F., 2013. Institutional performance of payments for environmental services: An analysis of the Costa Rican program. *Forest Policy and Economics* 37 (December 2013), 115-123.
- Liss, B.-M., 2008. Development and application of a pilot policy on payment for environmental services (PES) in Da river basin, Son La province. Consultant report to the Vietnamese-German forestry programme, International consultancy services, Landsberg/Lech, Germany.
- Litzenberg, I., 2013. Vietnam forest protection and development fund. Paper presented at the regional workshop on 'Challenges in benefit sharing and livelihood improvement with water storage development', March 20-21, 2014., Vientiane, Lao PDR.
- Ly, N.T.Y., 2013. Evaluating the pilot implementation of payment for forest environmental services in Lam Dong, Vietnam. *Economy and Environment Program for Southeast Asia (EEPSEA)*. Tanglin, Singapore.
- Manasboonphempool, A., Zeller, M., 2012. Data from livelihood survey in Da Bac district, Hoa Binh province, Vietnam, in 2012. Personal communications.
- MARD, 2012a. Circular No.20/2012/TT-BNNPTNT dated May 7, 2012 of the Minister on procedures for verification of forest protection performance and making payments for forest environmental services. Ha Noi, Vietnam.
- MARD, 2012b. Decision No. 3003/QD-BNN-TCLN dated November 29, 2012 of the Minister on the declaration of forest areas in the watersheds covering territory in two or more provinces as the basis for policy on payments for forest environmental services. Ha Noi, Vietnam.
- MARD, 2012c. Forest sector development report 2011: Serving FSSP annual plenary meeting, 1 March 2012. Ha Noi, Vietnam.
- MARD, 2013. Decision No. 2092/QD-BNN-TCLN dated September 12, 2013 of the Minister on adjustment of respective forest areas belonging to Hoa Binh province in the watershed of Hoa Binh hydropower plant. Ha Noi, Vietnam.
- MARD, 2015. Decision No. 3135//QD-BNN-TCLN dated August 6, 2015 of the Minister on the declaration of national forests status in 2014. Ha Noi, Vietnam.
- Marshall, G.R., 2013. Transaction costs, collective action and adaptation in managing complex social-ecological systems. *Ecological Economics* 88 (April 2013), 185-194.
- Mayrand, K., Paquin, M., 2004. Payments for environmental services: A survey and assessment of current schemes. Unisfera International Centre. Montreal, Canada. 52p.
- Mburu, J., Birner, R., Zeller, M., 2003. Relative importance and determinants of landowners' transaction costs in collaborative wildlife management in Kenya: An empirical analysis. *Ecological Economics* 45 (1), 59-73.

GENERAL BIBLIOGRAPHY

- McCann, L., Colby, B., Easter, K.W., Kasterine, A., Kuperan, K.V., 2005. Transaction cost measurement for evaluating environmental policies. *Ecological Economics* 52 (4), 527-542.
- McElwee, P., 2009. Reforesting “bare hills” in Vietnam: Social and environmental consequences of the 5 million hectare reforestation program. *Ambio: A Journal of the Human Environment* 38 (6), 325-333.
- McElwee, P.D., 2012. Payments for environmental services as neoliberal market-based forest conservation in Vietnam: Panacea or problem? *Geoforum* 43 (3), 412-426.
- Meshack, C.K., Ahdikari, B., Doggart, N., Lovett, J.C., 2006. Transaction costs of community-based forest management: Empirical evidence from Tanzania. *African Journal of Ecology* 44 (4), 468-477.
- Mettepenningen, E., Verspecht, A., van Huylenbroeck, G., 2009. Measuring private transaction costs of European agri-environmental schemes. *Journal of Environmental Planning and Management* 52 (5), 649-667.
- Milder, J.C., Scherr, S.J., Bracer, C., 2010. Trends and future potential of payment for ecosystem services to alleviate rural poverty in developing countries. *Ecology and Society* 15 (2), 4.
- Ministry of Agriculture and Rural Development; Ministry of Planning and Investment; and Ministry of Finance, 2009. Inter-Ministerial Circular No. 70/2009/TTLT/BNN-KHDT-TC dated November 4, 2009 of the Ministers on revising Circular No. 58/2008/TTLT/BNN-KHDT-TC dated May 2, 2008, and Circular No. 28/1999/TT-BTC dated March 13, 1999 on guidance to manage national budget for the implementation of the Five Million Hectare Reforestation Program. Ha Noi, Vietnam.
- Muradian, R., Corbera, E., Pascual, U., Kosoy, N., May, P.H., 2010. Reconciling theory and practice: An alternative conceptual framework for understanding payments for environmental services. *Ecological Economics* 69 (6), 1202-1208.
- Muradian, R., Martinez-Tuna, M., Kosoy, N., Perez, M., Martinez-Alier, J., 2008. Institutions and the performance of payments for water-related environmental services. Lessons from Latin America. Development Research Institute, Tilburg University. Tilburg, Netherlands.
- Musole, M., 2009. Property rights, transaction costs and institutional change: Conceptual framework and literature review. *Progress in Planning* 71 (2), 43-85.
- Naeem, S., Ingram, J., Varga, A., Agardy, T., Barten, P., Bennett, G., Bloomgarden, E., Bremer, L., Burkill, P., Cattau, M., 2015. Get the science right when paying for nature's services. *Science* 347 (6227), 1206-1207.
- Nambiar, E.S., 1999. Productivity and sustainability of plantation forests. *Bosque* 20 (1), 9-21.
- Nga, D.T., 2014a. Payments for forest environmental services in Vietnam: Historical development and challenges. Presentation to a workshop on "Challenges in benefit sharing and livelihood improvement with water storage development", Vientiane, Lao PDR.

GENERAL BIBLIOGRAPHY

- Nga, D.T., 2014b. Payments for forest environmental services: Practice and challenges in Quang Nam, Nghe An, and Thanh Hoa. Paper presented during the Stakeholder workshop on benefit sharing and payments for environmental services, 10-11, March 2014. Ha Noi, Vietnam.
- Nguyen, T.T., 2012. Land reform and farm production in the Northern Uplands of Vietnam. *Asian Economic Journal* 26 (1), 43-61.
- Nguyen, T.T., Bauer, S., Uibrig, H., 2010. Land privatization and afforestation incentive of rural farms in the Northern Uplands of Vietnam. *Forest Policy and Economics* 12 (7), 518-526.
- Nguyen, T.T., Koellner, T., Le, Q.B., Lambini, C.K., Choi, I., Shin, H.-j., 2014. An economic analysis of reforestation with a native tree species: The case of Vietnamese farmers. *Biodiversity and Conservation* 23 (4), 811-830.
- Nguyen, T.T., Pham, V.D., Tenhunen, J., 2013. Linking regional land use and payments for forest hydrological services: A case study of Hoa Binh Reservoir in Vietnam. *Land Use Policy* 33 (July 2013), 130-140.
- Nkhata, B.A., Mosimane, A., Downsborough, L., Breen, C., Roux, D.J., 2012. A typology of benefit sharing arrangements for the governance of social-ecological systems in developing countries. *Ecology and Society* 17 (1), 17.
- North, D.C., 1990. *Institutions, institutional change and economic performance*. Cambridge University Press, Cambridge, United Kingdom.
- Ostrom, E., 1990. *Governing the commons: The evolution of institutions for collective action*. Cambridge University Press, Cambridge, United Kingdom.
- Ostrom, E., Burger, J., Field, C.B., Norgaard, R.B., Policansky, D., 1999. Revisiting the commons: Local lessons, global challenges. *Science* 284 (5412), 278-282.
- Pagiola, S., 2008. Payments for environmental services in Costa Rica. *Ecological Economics* 65 (4), 712-724.
- Pagiola, S., Arcenas, A., Platais, G., 2005. Can payments for environmental services help reduce poverty? An exploration of the issues and the evidence to date from Latin America. *World Development* 33 (2), 237-253.
- Pearson, T.R.H., Brown, S., Sohngen, B., Henman, J., Ohrel, S., 2013. Transaction costs for carbon sequestration projects in the tropical forest sector. *Mitigation and Adaptation Strategies for Global Change* 19 (8), 1209-1222. This article is published with open access at Springerlink.com. DOI 1210.1007/s11027-01309469-01309468.
- Peters, J., 2008. The pilot payments for forest environmental services policy in Vietnam and PES pilot sites in the Dong Nai river basin., Presentation to IWLEARN regional workshop on payments for environmental services, Ha Noi, Vietnam.
- Phelps, J., Webb, E.L., Agrawal, A., 2010. Does REDD+ threaten to recentralize forest governance. *Science* 328 (5976), 312-313.

GENERAL BIBLIOGRAPHY

- Phuc, T.X., Dressler, W.H., Mahanty, S., Thuy, P.T., Zingerli, C., 2012. The prospects for payment for ecosystem services (PES) in Vietnam: A look at three payment schemes. *Human Ecology* 40 (2), 237-249.
- Phuc, T.X., Nghi, T.H., 2014. Forest land allocation in the context of forestry sector restructuring: Opportunities for forestry development and uplands livelihood improvement. Tropenbos International Vietnam. Hue, Vietnam.
- Porras, I.T., Grieg-Gran, M., Neves, N., 2008. All that glitters: A review of payments for watershed services in developing countries. International Institute for Environment and Development (IIED).
- Prokofieva, I., Gorriz, E., 2013. Institutional analysis of incentives for the provision of forest goods and services: An assessment of incentive schemes in Catalonia (north-east Spain). *Forest Policy and Economics* 37 (December 2013), 104-114.
- Qi, S., 2014. Research on the legal system of payment for ecosystem services under the global perspective. *Canadian Social Science* 10 (2), 108-112.
- Ray, B., Bhattacharya, R.N., 2011. Transaction costs, collective action and survival of heterogeneous co-management institutions: Case study of forest management organisations in West Bengal, India. *Journal of Development Studies* 47 (2), 253-273.
- Rørstad, P.K., Vatn, A., Kvakkestad, V., 2007. Why do transaction costs of agricultural policies vary? *Agricultural Economics* 36 (1), 1-11.
- Royer, A., 2011. Transaction costs in milk marketing: A comparison between Canada and Great Britain. *Agricultural Economics* 42 (2), 171-182.
- Šálek, L., Sloup, R., 2012. Economic evaluation of proposed pure and mixed stands in Central Vietnam highlands. *Journal of Agriculture and Rural Development in the Tropics and Subtropics* 113 (1), 21-29.
- Šálek, L., Výlupek, O., 2012. Contribution to the restoration of mixed forests in Central Vietnam. *Journal of Sustainable Forestry* 31 (6), 549-562.
- Sam, D.D., Trung, L.Q., 2001. Forest policy trends in Vietnam. Institute for Global Environment Strategies (IGES), Miura, Japan.
- Scherr, S.J., Bennett, M.T., 2011. Buyer, regulator, and enabler - The government's role in ecosystem services markets: International lessons learned for payments for ecological services in the People's Republic of China. Asian Development Bank. Mandaluyong city, Philippines.
- Scherr, S.J., Michael T. Bennett, Molly Loughney, Canby, K., 2006. Developing future ecosystem service payments in China: Lessons learned from international experience. *Forest Trends*. Washington, D.C., USA.
- Schiffer, E., 2007. Net-Map toolbox introduction. Paper was presented at the Sunbelt Conference of the International Network of Social Network Analysis, Corpu, May 2007.

GENERAL BIBLIOGRAPHY

- Sikor, T., 1998. Forest policy reform: From state to household forestry. In: *Stewards of Vietnam's upland forests*. Asia Forest Network, Berkeley, pp. 18-38.
- Sikor, T., Tan, N.Q., 2007. Why may forest devolution not benefit the rural poor? Forest entitlements in Vietnam's central highlands. *World Development* 35 (11), 2010-2025.
- Sikor, T., Tan, N.Q., 2011. Realizing forest rights in Vietnam: Addressing issues in community forest management. The Center for People and Forests (RECOFTC). Bangkok, Thailand.
- Singleton, S., 2000. Co-operation or capture? The paradox of co-management and community participation in natural resource management and environmental policy-making. *Environmental Politics* 9 (2), 1-21.
- Sommerville, M.M., Jones, J.P., Milner-Gulland, E., 2009. A revised conceptual framework for payments for environmental services. *Ecology and Society* 14 (2), 34.
- Sommerville, M.M., Milner-Gulland, E., Jones, J.P., 2011. The challenge of monitoring biodiversity in payment for environmental service interventions. *Biological Conservation* 144 (12), 2832-2841.
- Suhardiman, D., Wichelns, D., Lestrelin, G., Hoanh, C.T., 2013. Payments for ecosystem services in Vietnam: Market-based incentives or state control of resources? *Ecosystem Services* 6 (September 2013), 64-71.
- Sunderlin, W.D., Ba, H.T., 2005. Poverty alleviation and forests in Vietnam. Center for International Forestry Research. Jakarta, Indonesia.
- Tallis, H., Kareiva, P., Marvier, M., Chang, A., 2008. An ecosystem services framework to support both practical conservation and economic development. *Proceedings of the National Academy of Sciences*, pp. 9457-9464.
- Tan, N.Q., 2006. Trends in forest ownership, forest resources tenure and institutional arrangements: Are they contributing to better forest management and poverty reduction? Case study from Vietnam. In: *Understanding forest tenure in South and Southeast Asia - Forestry Policy and Institutions Working Paper No 14*. Food and Agriculture Organization of the United Nations (FAO), Rome, Italy, pp. 355-407.
- Tan, N.Q., 2011. Payment for environmental services in Vietnam: An analysis of the pilot project in Lam Dong province. Institute for Global Environmental Strategies (IGES). Hayama, Japan.
- Tan, N.Q., Ngai, N.B., Thanh, T.N., 2007. Forest tenure reform in Viet Nam: Experiences from Northern Upland and Central Highlands regions. International conference on poverty reduction and forests, Bangkok, Thailand.
- Tan, N.Q., Ngai, N.B., Thanh, T.N., Sunderlin, W., Yasmi, Y., 2008. Forest tenure reform in Vietnam: Case studies from the Northern Upland and Central Highlands regions. The Center for People and Forests (RECOFTC), Bangkok, Thailand and The Rights and Resources Initiative (RRI), Washington D.C, USA. Unpublished Draft Report.

GENERAL BIBLIOGRAPHY

- The, B.D., Ha, D.T., Chinh, N.Q., 2004. Rewarding upland farmers for environmental services: Experience, constraints and potential in Vietnam. World Agroforestry Centre (ICRAF), Bogor, Indonesia.
- Thuy, P.T., Bennett, K., Phuong, V.T., Brunner, J., Dung, L.N., Tien, N.D., 2013. Payments for forest environmental services in Vietnam: From policy to practice. Occasional Paper 93. Center for International Forestry Research. Bogor, Indonesia.
- Thuy, P.T., Moeliono, M., Hien, N.T., Tho, N.H., Hien, V.T., 2012. The context of REDD+ in Vietnam: Drivers, agents and institutions. Center for International Forestry Research. Bogor, Indonesia.
- Todorova, M., Martini, M.L., I., Grigороva, Y., J., T., 2013. Promoting payments for ecosystem services and related sustainable financing schemes in the Danube Basin. WWF, Switzerland.
- Van Huylenbroeck, G., D' Haese, M., Verspecht, A., 2005. Methodology for analysing private transaction costs. ITAES deliverable WPG P3D5 (2005), Vol. 5. Integrated tool to design and implement agro environmental schemes. National Institute of Agronomic Research, Paris, France. Available at <https://w3.rennes.inra.fr/internet/ITAES/website/Publicdeliverables/Methodology%20for%20analysing%20private%20transaction%20costs.pdf>.
- Vatn, A., 2010. An institutional analysis of payments for environmental services. *Ecological Economics* 69 (6), 1245-1252.
- Vatn, A., Barton, D., Lindhjem, H., Movik, S., Ring, I., Santos, R., 2011. Can markets protect biodiversity? An evaluation of different financial mechanisms. Department of International Environment and Development Studies, Noragric. Norwegian University of Life Sciences, Norway. Naragric Report.
- Vietnam National Assembly, 2004. Forest Protection and Development Law 2004. Ha Noi, Vietnam.
- Vietnam National Assembly, 2008. Biodiversity Law 2008. Ha Noi, Vietnam.
- VNFF, 2013. Proceedings workshop on payment for forest environmental services in Vietnam - Status and solutions. Ha Noi, Vietnam.
- VNFF, 2014a. Payments for forest environmental services (PFES) in Vietnam: Findings from three year of implementation. Vietnam Forest Protection and Development Fund. Available at http://www.cifor.org/publications/pdf_files/factsheet/5066-factsheets.pdf [Accessed 15.1.2016]. Ha Noi, Vietnam.
- VNFF, 2014b. Report [no number] on the implementation of the payments for forest environmental services program in 2013 and on planning for the implementation in 2014. Ha Noi, Vietnam.
- Wärneryd, K., 1994. Transaction cost, institutions, and evolution. *Journal of Economic Behavior & Organization* 25 (2), 219-239.

GENERAL BIBLIOGRAPHY

- Webb, E.L., 2008. Forest policy as a change context in Asia. In: Decentralization, forests and rural communities: Policy outcomes in South and Southeast Asia. Webb E. L. and Shivakoti G. (Eds). SAGE Publications India. New Delhi, pp. 21-43.
- Wertz-Kanounnikoff, S., Rankine, H., 2008. How can governments promote strategic approaches to payments for environmental services (PES). An exploratory analysis for the case of Viet Nam. The Institute for Sustainable Development and International Relations (IDDRI) Paris, France.
- Widmark, C., Bostedt, G., Andersson, M., Sandström, C., 2013. Measuring transaction costs incurred by landowners in multiple land-use situations. *Land Use Policy* 30 (1), 677-684.
- Winrock International, 2011. Payment for forest environmental services: A case study on pilot implementation in Lam Dong province, Vietnam from 2006 to 2010. Little Rock, USA.
- World Bank, 2012a. World development indicators [Online]. Available at <http://search.worldbank.org/all?qterm=exchange+rate+of+vietnam&title=&filetype=> [Accessed: October 15, 2013].
- World Bank, 2012b. World development indicators [Online]. Available at <http://search.worldbank.org/all?qterm=inflation%20rate%20of%20vietnam> [Accessed: October 15, 2013].
- Wunder, S., 2005. Payments for environmental services: Some nuts and bolts. Occasional Paper No. 42. Center for International Forestry Research. Bogor. Indonesia.
- Wunder, S., 2008. Payments for environmental services and the poor: Concepts and preliminary evidence. *Environment and Development Economics* 13 (3), 279-297.
- Wunder, S., 2015. Revisiting the concept of payments for environmental services. *Ecological Economics* 117 (September 2015), 234-243.
- Zhu, X., Møller, L.R., De Lopez, T.T., Zaballa Romero, M.E., 2010. Pathways for implementing REDD+: Experiences from carbon markets and communities. Danmarks Tekniske Universitet, Risø Nationallaboratoriet for Bæredygtig Energi.
- Zilberman, D., Lipper, L., McCarthy, N., 2008. When could payments for environmental services benefit the poor? *Environment and Development Economics* 13 (3), 255-278.

APPENDICES

APPENDIX A: THE IMPLEMENTATION OF PROGRAM 661 AND ITS TRANSACTION COSTS

APPENDIX A.1: Semi-structure interviews with households

H1. General information and participation in the program

1. Socio-economic condition
 - a. Household members and number of family labor
 - b. Main sources of income
 - c. Area of forest and forest land (including allocated and contracted forest land)
2. Can you classify your household's allocated/contracted forests (e.g., special-use -, protected-, and production- forests)? How do you know this classification? (e.g., self-experienced or to be informed by contractor)?
3. Evaluating forest access
 - a. How many minutes by walk from your house to the nearest forests?
 - b. How many minutes by walk from your house to the farthest forests?
4. Why does your household participate in *Program 661*?
5. What are difficulties in forest protection?
6. Does your household have any conflicts/problems related to implementing the contract of forest protection from obtaining the contract up to now? When? How were they resolved? Who else dealt with the problem?
7. Would you agree that forest protection activity is well controlled by contractor in each following stage:
 - a. Contract signing
 - b. Monitoring
 - c. Evaluating; and
 - d. Distributing the paymentWhy? Can you give me an example?
8. What would your household do with the current planted forest in the next 12 months? Why so?
9. Imagine that the government of Vietnam stops providing subsidies for forest protection. Would your household continue to protect forests? Why or why not?
10. Imagine that the government of Vietnam gives your household the choice to decide subsidies that fit your interest in order to protect forests, what kind of subsidies do you prefer? Why so?

H2. Transaction costs of carrying out forest protection activities

1. Before obtaining the contract

What did you do before obtaining the contract of forest protection?

Activity	Time spending (hour)	Other costs (1,000 VND)
1. Learning about the program		
2. Making a plan for forest protection		
3. Obtaining the contract		

2. Obtaining the contract

- 2.1. Who do you make the contract with?

APPENDIX A.1

According to the contract.

- 2.2. For how long does the contract last?
- 2.3. How large is your household's forests contracted to protect?
- 2.4. How high is the payment per hectare per year?
- 2.5. Apart from the payment, have you had any other benefits? If so, specify.

3. Operating

Activity	When	Time spending (hour)	Other costs (1,000 VND)
3.1. Renewal the contract and getting the payment from contractor in the past 12 months			

3.2. Have you ever received higher or lower payment per hectare per year compared to the amount that is indicated in the approved contract? When? Why?

3.3. What would you have done if you had not participated in forest protection in the past 12 months? How much would you have received per day?

4. Monitoring and enforcement in the past 12 months

Activity	Time spending (hour)	Other costs (1,000 VND)
1. Own monitoring forests		
2. Joining contractor's monitoring on the ground		
3. Joining contractor's verification on the ground		
4. Resolution for conflict with contractor while implementing forest protection activities		
5. Resolution for conflict with outsiders in regard to unclear boundary of your area being protected		

5. Benefits in the past 12 months

5.1 What kind of benefit did you obtain from forest protection in the past 12 months?

Time	NTFPs (ton)			Others (1,000 VND)
	Bamboo shoot	Firewood	Others (specify)	
July 2012				
June				
May				
April				
March				
February				
January				
December 2011				
November				
October				
September				
August				

5.2 What kind of benefits, apart from the payment and NTFPs, did you receive from carrying out forest protection in the past 12 months?

APPENDIX A.2: Semi-structured interviews with communities

C1. Initiation/information searching

1. Before obtaining the contract

What did your village do before obtaining the contract of forest protection?

Activity	Number of people involved (people)	Time spending (hour)	Other costs (1,000 VND)
1. Forest Guard Groups establishment			
2. Learning about the program			
3. Formulation of forest protection regulation (e.g., sub-group assignment to patrol forests, the method and frequency of patrolling forests, requirement to attend village meetings, etc.)			
4. Village Management Board establishment			
5. Other informal meetings			
6. Obtaining the contract			

2. Obtaining the contract

2.1. Who does your village make the contract with?

According to the contract,

2.2. For how long does the contract last?

2.3. How large is your village's forests contracted to protect?

2.4. How many village members involved in implementing the contract?

2.5. How high is the payment per hectare per year?

2.6. Apart from the payment, has your village had any other benefits? If so, specify.

C2. Coordination/organization

1. Overhead

	When	Why	Number of people involved	Time spending (hour)	Other costs (1,000 VND)
1. Has your village made any changes to Village Management Board since the first establishment up to now?					
- 1 st time					
- 2 nd time					
2. Has your village made any changes to Forest Guard Group member since the first establishment up to now?					
- 1 st time					
- 2 nd time					
3. Has your village ever revised the regulations of forest protection since the first formulation up to now?					
- 1 st time					
- 2 nd time					
4. How did your village inform village members about their turn to patrol forests in the past 12 months?					
5. How did your village get the payment from					

APPENDIX A.2

contractor in the past 12 months?					
6. How did your village distribute the PFES payment to members in the past 12 months?					

2. Regular meeting

2.1. Did your village have weekly or monthly meeting in the past 12 months? (e.g., meeting for discussion of forest protection plan, for periodic reports of forest protection activity, etc.)

If yes,

2.2. How long did it take for a meeting, on average?

2.3. Did all village members have to attend?

3. Opportunity foregone in the past 12 months

Opportunity foregone	Option 1	Estimated earnings (1,000 VND/day)	Option 2	Estimated earnings (1,000 VND/day)
1. To attend a meeting				
2. To participate in forest protection				

C3. Monitoring and enforcement

	Number of people involved (people)	Time spending (hour)	Other costs (1,000 VND)
Monitoring in the past 12 months			
1. Sending watchmen to monitor other group member's performance			
2. Joining contractor's monitoring on the ground			
3. Joining contractor's verification on the ground			
Group maintenance in the past 12 months			
1. Rewarding meeting for the best village member's performance			
Dispute settlement/conflict resolution in the past 12 months			
1. Breaking the rule by village member s (e.g., do not attend meetings or do not doing assigned tasks, etc.)			
2. Conflicts among village members while implementing forest protection activities (e.g., unfairness in task allocation, inequality to access to NFTP's extraction)			
3. Conflict with contractor while implementing forest protection activities			
4. Conflict with outsiders in regard to unclear boundary of your village's area being protected			

5. How were the burden/costs shared among village members in the past 12 months?

C4. Benefit sharing

1. Benefits from forest management in the past 12 months

Month	NTFPs (ton)			Others (1,000 VND)
	Bamboo shoot	Firewood	Others (specify)	
July of 2012				
June				
May				
April				
March				
February				
January				
December of 2011				
November				
October				
September				
August				

2. What kind of benefits, apart from the payment and NTFPs, did your village receive from carrying out forest protection?

3. How were the benefits (including the payment, NTFPs, and other benefits) shared among village members in the past 12 months?

C5. Other issues

1. Why does your village participate in *Program 661*?

2. Evaluating the forest access

5.1. How many minutes by walk from the village cultural house to your village's nearest forests?

5.2. How many minutes by walk from the village cultural house to your village's farthest forests?

3. What are difficulties in forest protection?

4. Have you ever received higher or lower payment per hectare per year compared to the amount that is indicated in the approved contract? When? Why?

5. Which year do you have most meetings since you obtained the contract up to now? Why?

6. Did you have any conflicts or problems related to implementing the contract of forest protection from obtaining the contract up to now? When? How was it resolved? Who else dealt with the problem?

7. What kind of activities would you plan to do in the next 12 months and in the next five years for a better performance of forest protection? Why?

8. Scenario to evaluate trust among members: Imagine that in this morning, you saw a person who was extracting timber illegally, what would you do first?

9. Would you agree that forest protection activity is well controlled by contractor in each following stage:

- Contract signing
- Monitoring
- Evaluating; and
- Distributing the payment

Why? Could you give me an example?

APPENDIX A.2

10. Evaluating the collective action and solidarity
 - 10.1. Have you ever attempted to make any improvement relevant to forest protection activities but failed since signing the contract up to now? When? How did you overcome?
 - 10.2. Have you ever experienced with any improvements relevant to forest protection activities that were success more than expectation? If so, please specify.
11. Imagine that the government of Vietnam stops providing subsidies for forest protection. Would you continue to protect forests? Why or why not?
12. Imagine that the government of Vietnam gives you the choice to decide subsidies that fit your interest in order to protect forests, what kind of subsidies do you prefer?

APPENDIX A.3: Semi-structured interviews with People's Committees at commune, district, and provincial-levels

General information of Program 661

1. How was *Program 661* first introduced in your commune/district/province?
2. Why does your commune/district/province participate in *Program 661*?
3. How many villages/communes/districts in your commune/district/province participated in *Program 661*?
4. Explain me how *Program 661* worked during the past 12 months?
5. What kind of benefit does your commune/district/province obtain from participating in *Program 661*?
6. What are difficulties in the implementation of *Program 661* in your commune/district/province?
7. How much time did your commune/district/province spend for forest protection and for forest production activities during the past 12 months?
8. How much *Program 661*'s budget has been distributed to your commune/district/province up to now (please specify by year)?
9. How did the money go to the villages or community in the past 12 months?
10. Has your commune/district/province have any conflicts/ problems related to implementing *Program 661*? When? How were they resolved? Who else dealt with problems?
11. Has your commune/district/province have any success related to implementing *Program 661*? When? What did you learn?

For forest protection activities

12. How many villages/communes/districts in your commune/district/province participated in forest protection contract?
13. How many hectares are planned for forest protection activity under *Program 661*?
14. Would you agree that forest protection activity is well controlled by contractors in each following stage:
 - Contract signing
 - Monitoring
 - Evaluating; and
 - Distributing the paymentWhy? Could you give me examples?
15. What would your commune/district/province do for a better performance of forest protection in the next 12 months and in the next 5 years? Why?
16. Imagine that the government of Vietnam stops providing subsidies for forest protection. Would your commune/district/province continue to protect forests? Why or why not?
17. Imagine that the government of Vietnam gives your commune/district/province the choice to decide subsidies that fit your interest in order to protect forests, what kind of subsidies do you prefer?

General evaluation of Program 661

18. Evaluating *Program 661* and find out the area for improvement (how can *Program 661* be improved?)
 - a. Tool: Net-Map
 - b. Participants: commune/district/province people's committees' representatives

APPENDIX A.4: Semi-structured interviews with forest management boards

D0. General information

1. General information
 - a. Foundation, vision, mission of the board
 - b. The structure of management board
2. How do you involve in *Program 661*?
3. Which year do you have most meetings from the beginning of the program up to now? Why?
4. How many types of contract for forest protection under the program? What are differences among those contracts?
5. How many hectares of forest have you contracted with households and/or communities to protect (please specify by types of contract) from the beginning of the program up to now?
6. What are the main provisions of a contract of forest protection? Have you ever changed the provisions of a contract? When? Why? Apart from the payment, do households and/or communities have any other benefits? If yes, please specify.
7. Have you increased or decreased the level of payment per hectare per year compared to the amount indicated in the approved contract? When? Why?
8. What are difficulties in the implementation of *Program 661*?
9. How much time did you spend for forest protection and for forest production activities during the past 12 months?
10. Did you have any conflicts/problems related to implementing *Program 661* in general, and to forest protection activities in particular in the past 5 years? How were they resolved? Who else dealt with problems?
11. Did you have any success related to implementing *Program 661* in general, and to forest protection activities in particular in the past 5 years? What did you learn from this success?
12. What would you do for a better performance of forest protection in the next 12 months and in the next 5 years? Why?
13. Evaluating *Program 661* and find out the area for improvement (Tool: Net-Map)

D1. Initiation/information searching

1. What did you do before signing the contract of forest protection with households and/or communities?

Activity	Number of people involved	Time spending (hour)	Other costs (1,000 VND)
1. Management Board establishment			
2. Operating regulation formulation			
2. Learning about the program			
3. Informing households and/or communities about the contract			
4. Households and/or communities selection			
5. Evaluating forest protection plan of households and/or communities			
6. Informing households and/or communities about approval contracts			
7. Formulating criteria for verification of forest protection performance			

D2. Coordination/organization

1. Overhead costs

	When	Why	Number of people involved	Time spending (hour)	Other costs (1,000 VND)
1. Have you made any changes to Management Board since the first establishment up to now?					
- 1 st time					
- 2 nd time					
2. Have you revised contract's provisions for forest protection since the first formulation up to now?					
- 1 st time					
- 2 nd time					
3. How did you receive and manage program's budget in the past 12 months?					
4. How did you distribute money to households and/or communities in the past 12 months?					
5. How did you verify forest protection performance on the ground in the past 12 months?					

2. Number of regular and/or irregular meetings in the past 12 months (e.g., changing contract provisions, periodic report of forest protection activity)

Activity	Number of people involved	Time spending (hour)	Other costs (1,000 VND)
1. Weekly meeting			
2. Monthly meeting			
3. Quarterly meeting			
4. Annual meeting			
5. Irregular meeting			

D3. Monitoring and enforcement

	Why	Time spending (hour)	Other costs (1,000 VND)
Monitoring			
1. How did you monitor forest protection's performance on the ground in the past 12 months?			
Management board maintenance			
1. Rewarding meeting for the best management board member in the past 12 months			
Conflicts resolution in the past 12 months			
1. Conflicts among management board members (e.g., unfairness in task allocation)			
2. Contract violation			

D4. Outcomes

1. How much *Program 661*'s budget has been distributed to your management board from the beginning of the program up to now (please specify by year)? Of which, how was money spent for which activities?

APPENDIX A.4

2. How many hectares are protected by year by households and/or communities from the beginning of the program up to now?
3. How many hectares are reforested by year by households and/or communities from the beginning of the program up to now?

APPENDIX B: QUESTIONNAIRE TO TU LY SFE, DA BAC DISTRICT, HOA BINH PROVINCE, VIETNAM 2012

Date _____ Household head _____
 Village _____ Name of respondent _____
 Commune _____ Cellphone number _____
 Ethnic group of household head
 1 – Kinh 2 – Muong 3 – Dao 4 – Tay 5 – Thai 6 – Other _____

Demographic profile

ID	2.1 Relation to hh head (code 1)	2.2 Sex 1= Male 2= Female	2.3 Age	2.4 Marital Status (code 2)	2.5 Can read/ write Yes=Y No= N	2.6 Highest class passed (code 3)	2.7 <i>If > 6 years Old</i> Main occupation in the 12 past months (code 5)	
							Primary	Secondary
1	h / s / c / p / gp / gc / s / r / nr	M / F		s / m / msm / w / d	Y / N			
2	h / s / c / p / gp / gc / s / r / nr	M / F		s / m / msm / w / d	Y / N			
3	h / s / c / p / gp / gc / s / r / nr	M / F		s / m / msm / w / d	Y / N			
4	h / s / c / p / gp / gc / s / r / nr	M / F		s / m / msm / w / d	Y / N			
5	h / s / c / p / gp / gc / s / r / nr	M / F		s / m / msm / w / d	Y / N			
6	h / s / c / p / gp / gc / s / r / nr	M / F		s / m / msm / w / d	Y / N			
7	h / s / c / p / gp / gc / s / r / nr	M / F		s / m / msm / w / d	Y / N			
8	h / s / c / p / gp / gc / s / r / nr	M / F		s / m / msm / w / d	Y / N			
9	h / s / c / p / gp / gc / s / r / nr	M / F		s / m / msm / w / d	Y / N			
10	h / s / c / p / gp / gc / s / r / nr	M / F		s / m / msm / w / d	Y / N			

APPENDIX B

Code 1 Relation to household head

Household head.....	h
Spouse.....	s
Son or daughter.....	c
Father or mother.....	p
Grandparent.....	gp
Grandchild.....	gc
Brother or sister.....	s
Other relative.....	r
Other non relative.....	nr

Code 2 Marital status

Single.....	1
Married with spouse permanently present in the household.....	2
Married with the spouse migrant.....	3
Widow / widower.....	4
Divorced / separated.....	5

Code 3 Education

Never attended school.....	99
1st year of Primary school.....	0
Put the number of the highest class passed (1-8)	
Secondary degree.....	9
Vocational diploma.....	10
High school certificate.....	11
High education degree.....	12
Bachelor degree.....	13
Master and more.....	14

Code4 Occupation

Self employed in agriculture.....	1
Self employed in non-farm enterprise...	2
Student/pupils.....	3
Government employee.....	4
Salaried worker in agriculture.....	5
Salaried worker in non agriculture.....	6
Daily agricultural labor.....	7
Daily non agricultural labor.....	8
Military service.....	9
Unemployed.....	10
Disabled.....	11

APPENDIX B

Assets, dwelling and credit

Assets type and code	Number owned	Assets type and code	Number owned
Animals		Household	
a. Buffalo		h. Television	
b. Pig		i. Gold jewellery	
c. Goat		j. Karaoke	
d. Cattle		k. Refrigerator or freezer	
e. Dog		l. Radio/cassette player	
f. Chicken		m. Gas/electric stove	
Transportation		n. Rice/pressure cooker	
g. Bicycle		Farm	
h. Motorbike		o. Agricultural land	
i. Car/Pick-up truck		p. Motor tiller	
j. Boat		q. Plough	

How many rooms does your household occupy (including living rooms, bedrooms, etc)	
Type of floor	1 – Mud floor or rudimentary stilts 2 – On wooden/stone stilts 3 – Cement base / expensive wood
Type of roof	1 – Concrete, cement 2 – Tile 3 – Galvanized iron 4 – Panels 5 – Canvas, tar paper 6 – Wood, bamboo 7 – Straw, leaves 8 - Other
Type of walls	1 – Bamboo / thatch 2 – low quality wood/logs 3 – brick /cement/high quality materials
Type of toilet	1 – Flush toilet 2 – Double vaults compost latrine 3 – Toilet directly over the water 4 – Other type 5 – No toilet (in the woods)
Source of lighting	1 – Electricity 2 – Battery lamp 3 – Gas, oil, kerosene lamps 4 – Resin torches 5 - Other
Fuel used for cooking	1 – Wood 2 – Leaves/grass/rice husk/stubble/straw/thatch/stems 3 – Coal/Charcoal 4 – Bottled gas 5 – Electricity 6 – Kerosene 7 - Other

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Source of drinking water	1 – Tap water 2 – Private well 3 – Public well 4 – Rainwater collection barrel 5 – Spring water 6 – River/pond/lake 7 – Dam reservoir 8 - Other sources
--------------------------	--

How many plots of land is your household managing/own/rent out at the moment?

Type of land	Number of plots	Total area (sq.m)	Manage/Own /Rent Out	Source of water 1 – Tap water 2 – Private well 3 – Public well 4 – Rainwater 5 – Spring water 6 – River/pond/lake 7 – Dam reservoir 8 - Other sources
Agricultural (except for rice)			M / O / RO	
Paddy rice land			M / O / RO	
Upland rice			M / O / RO	
Protected forestry land			M / O / RO	
Production forest land			M / O / RO	
Other land			M / O / RO	

Questions on credit constraint. Yes=1 No=0	Formal organization (VBARD, VBSP, village board, mass organization, NGO)	Informal source (private moneylender, shopkeeper, fertilizer dealer, relative, friend/neighbor, etc.)
Did any member in your household apply for a loan from (source) in the past 12 months?	Y / N	Y / N
If your household applied, was the loan granted?	Y / N	Y / N

If household members did not attempt to borrow what are the main reasons? (Up to 3 reasons is possible)

- I did not need credit.....1
- Do not have enough information on how to get loan.....2
- Do not know anyone to borrow from.....3
- The banks/the lenders are too far.....4
- The procedure is too complicated.....5
- No guarantor.....6
- I dislike any borrowing.....7
- Other reasons (specify).....8

APPENDIX B

Household inflow/Livelihood activities

	For home consumption (including for livestock & for processing) (%)	For cash/income (%)	Annual income (VND)
Rice (including rice received from agriculture labour)			
Maize			
Cassava			
Arrow root			
Other crops (Cotton, sugar cane, etc.)			
Fruits			
Livestock			
Fisheries			
Bamboo and bamboo shoots			
Timber, firewood			
NTFP (plant, mushrooms, insects, wild animals, etc)			
Forest management wage			
Agricultural wage			
Non agricultural wage			
Non agricultural business (incl. revenue from lending land)			
Remittances			
Government aid			
Others (specify)			

Household expenditure in the past 12 months

Food expenditure

Item	Value (VND)
<i>Food at home</i>	
How much do you spend, on average, to purchase food to consume at home in one day?	
How much do you spend, on average, to purchase food to consume at home in a week day?	
What was the value of the food you consumed in a typical month from your own production? (approximately)	

Non-Food expenditure

How much did your household spend on the following items during the last 12 months?

Item	Value (VND)
Clothing and footwear	
School expenses and fees	
Medicine, hospital and other heal related issues	
Buying gold or jewelry	
Household furniture and appliances	
Vehicle	
Others	

APPENDIX B

Security and Vulnerability

S.1	Over the last 12 months, has your overall household economic situation? (Read answers) 1 = Decreased greatly 2 = Decreased 3 = Stayed the same 4 = Increased 5 = Increased greatly
S.2	If decreased, why? 1 = Household member was sick/died 2 = Natural disaster (flood, fire) 3 = Poor agricultural season (not natural disaster) 4 = Poor sales 5 = Lost job 6 = Unable to get inputs 7 = Others: _____
S.3	Please tell us which statement best describes the food situation in your household. (Read answers) 1 = Often not enough to eat 2 = Sometimes not enough to eat 3 = Enough but not always what we want to eat 4 = Enough and the kind of food we want to eat
S.4	In the past 12 months, was there ever a time when your family ate less than 3 meals a day because there was lack of food or not enough money to buy food? 0 = No 1 = Yes
S.5	Over the last 12 months, have you ever faced any of the following major events or crises? Multiples answers possible. 1 = Household member was sick / gave birth / married 2 = Loss of household member (death, divorce) 3 = Paid compensation for accident, problem 4 = Business slowdown or failure 5 = Household member lost job 6 = Crop damage due to flood/drought/erosion/pest 7 = Loss of agriculture/forest land 8 = Resettlement 9 = Others _____
S.6	What did your household do to cope with the difficult situation or unexpected expenses? Multiple answers possible. 1 = Spent savings 2 = Borrowed money/gold/inputs at no cost. 3 = Borrowed money/gold/inputs at cost. 4 = Sold/rented personal properties (land, equipments, jewelry, etc) 5 = Sold livestock 6 = Increased existing economic activity 7 = Seek employment (casual, permanent) 8 = Family member migrated to find better opportunities 9 = Others _____
S.7	Please tell which best describes the household situation when you need to pay for medicines and healthcare. 1 = We often need to borrow money or sell assets. 2 = We seldom/sometimes borrow money or sell assets. 3 = We never borrow money or sell assets.
S.8	Please tell which best describes the household situation about large expenses. 1 = We have great difficulty to afford large expenses. 2 = We have some difficulty to afford large expenses. 3 = We have no difficulty to afford large expenses.

APPENDIX B

S.9	Is someone in your household currently a member of any group or organization ? 0 = No 1 = Yes
Rice sufficiency Note: If household refers to unhusked rice, always convert to husked rice. <i>1kg unhusked rice =0.7 kg husked rice</i>	
How many months in the past 12 months did your household consume rice (of any kinds) that you grew or produced at home? <input type="text"/> Months (If none, write 0)	
How much did you consume in a typical month? <input type="text"/> Kg of rice	
What was the value of rice you consumed in a typical month on your own production? <input type="text"/> VND	
How many months in the past 12 months did your household purchase rice <u>for consumption</u> ? <input type="text"/> Months (If none, write 0)	
How much do you usually buy rice in one of the months that you purchase? <input type="text"/> Kg of husked rice	

Social capital and access to services and safety nets

What are the problems/concerns (on economic, social, environment, etc.) that your household is facing at the moment? *Please rank up to 3 most important problems.*

- | | | | | | |
|--|---|----------------------|-----------------|----------------------|-----------------|
| Decreasing yield of crop production..... | 1 | <input type="text"/> | 1 st | | |
| Land degradation, soil erosion..... | 2 | | | <input type="text"/> | 2 nd |
| Poverty..... | 3 | | | <input type="text"/> | 3 rd |
| Debt problem..... | 4 | | | | |
| Conflict with neighbors..... | 5 | | | | |
| Do not have enough land for farming..... | 6 | | | | |
| Others (please specify)..... | 7 | | | | |

How would you rate your access to government services listed below?	No access	Poor access	Good access
Education/schools			
Health services/clinic			
Housing assistance			
Job training/employment			
Credit/finance			
Road			
Water distribution for household use			
Agricultural extension			
Sanitation service			
Justice/ conflict resolution			
Security/ police services			
Information/Policies			

APPENDIX B

Forest land allocation and land tenure

Has your household received a Red Book for forestry land?

- Yes..... 1
- No..... 0

If 'Yes', when you received it?.....Year

If 'No', have your household applied for a Red Book for forestry land?

- Yes..... 1
- No.....0

If No, what are the main reasons why you haven't applied for the certificate? (keywords)

Do you think there will be a reallocation of land in your village before the end of the Use Right Period (i.e., 2044 in most of cases)...

- ...is very likely to occur?..... 1
- ...is likely to occur?..... 2
- ...is unlikely to occur?..... 3
- ...will not occur?..... 4

Forest production

Is your household managing forest owned by the Tu Ly state forest enterprise?

- No.....0
- As hired labor.....1
- With contract agreement.....2

Did you receive training on forest management from the Tu Ly state forest enterprise?

- Yes.....1
- No.....0

If yes, what kind of training did you receive?

How did you hear about the Tu Ly state forest enterprise program?

What did you like about the Tu Ly state forest enterprise program?

What can be improved about Tu Ly state forest enterprise program?

Contract Model: Costs and revenue from forests *Ask only to those farmers that have contract agreement with Tu Ly state forest enterprise*

	Unit/code	Value
What is the total forest area you are managing? (approximately)	m ²	
When did you start managing the forest?	Year	
How much loan did you get from Tu Ly state forest enterprise?	VND	
How much do you need to pay back?	VND	
When do you need to pay it back?	Year	
How many seedlings did you receive from Tu Ly Enterprise?	number	
How many trees did you grow? When did you grow these trees?		
Type 1	Type of tree	
	How many trees	number
	When	Time Month year
	Cost of seedlings	VND

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Type 2	Type of tree		
	How many trees	Number	
	When	Time Month year
	Cost of seedlings	VND	
Type 3	Type of tree		
	How many trees	number	
	When	Time Month year
	Cost of seedlings	VND	
Type 4	Type of tree		
	How many trees	number	
	When	Time Month year
	Cost of seedlings	VND	
Type 5	Type of tree		
	How many trees	number	
	When	Time Month year
	Cost of seedlings	VND	
How many man-days did you use to plant the tree at the beginning? (first year)			
- Members of household		# of days	
- Hired labor		# of days	
What was the total cost for hired labour?		VND	
What was the other costs that you spent in the beginning when you were establishing the forest? (transport, equipment, etc)		VND	
Operating costs			
How many man-days do you spend on each time to maintain the forest? (pruning, cleaning, etc)		2 nd year – 3 rd year	4 th year – 7 th year
-Members of household		# of days	
-Hired labor		# of days	
What was the total cost for hired labour?		VND	
What was the other costs that you spent on maintaining forest? Eg: fertilizer, additional seedlings...		VND	
What was the cost of harvesting timber and non-timber product from the forest?		VND	Time period
Have you received any subsidies/supports from the government?		<i>multiple answers</i>	No Seedlings Cash Loan
Revenue			
Have you obtained any monetary benefits from forest that you are managing so far?		Yes No	
How much did you get from selling timber products? And when?			
1st sale:..... month.....year		VND	
2nd sale:..... month.....year		VND	

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What is the quantity of fuelwood that you have collected in one year?	kg	
What is the share of the fuelwood that you sold?	%	
What is the average selling price of fuelwood?	VND/kg	
What is the value of edible plants and medicines that you have collected in one year? (e.g., last year)	VND	

What are other benefits you obtain from forest plantation? *Do not read answers. Multiple answers.*

- Improving soil quality.....1
- Trees provide shade and beauty.....2
- Forest is good for the environment.....3
(e.g., help improving air quality, reduce soil erosion, improve water quality downstream etc.)
- Forest can be considered a saving in case of emergencies or saving for children.....4
- Other (specify).....5
- None.....6

What are the reasons why you chose to plant forest? *Do not read answers. Multiple answers.*

- Hope to earn more income from forestry.....1
- Government provides support.....2
- Forestry does not need much labor.....3
- Other (specify).....4

At what degree did your contract agreement with Tu Ly state forest enterprise improve your economic situation?

- Decreased greatly.....1
- Decreased.....2
- Stayed the same.....3
- Increased.....4
- Increased greatly.....5

Hired Labor *Ask only to those farmers that are hired by Tu Ly state forest enterprise*

How many years have you been working for the Tu Ly state forest enterprise	# of years	
How many man-days where you hired to plant trees at the beginning?	# of days	
How many man-days where you hired to manage the forest (for one year)	# of days	
How much does Tu Ly State Enterprise pay per day for labor?	VND	
How much income do you receive from Tu Ly State Enterprise activities in one year?	VND	
Is this your main source of income?	Yes No	
What percentage of your household income comes from your salary from Tu Ly State Enterprise	%	

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What are other benefits you obtain from forest plantation? *Do not read answers. Multiple answers.*

- Improving soil quality.....1
- Trees provide shade and beauty.....2
- Forest is good for the environment.....3
(*e.g., help improving air quality, reduce soil erosion, improve water quality downstream etc.*)
- Forest can be considered a saving in case of emergencies or saving for children.....4
- Other (specify).....5
- None..... 6

At what degree did your employment with Tu Ly state forest enterprise improve your economic situation?

- Decreased greatly.....1
- Decreased.....2
- Stayed the same.....3
- Increased.....4
- Increased greatly.....5

Perceptions on sustainable livelihood

What do you think the government should provide/support in order to improve the livelihood in your community?

I would like to ask some questions concerning forest plantation in your community.

Do you think forest is important for your livelihood? For example, it would benefit agriculture production and environment?

- Yes.....1
- No.....2

Do you know that planting forest will also provide benefits to other people especially the hydropower dam at the downstream will get benefits from improving water flow and decreasing in sedimentation?

- Yes, I know.....1
- No, I don't know.....2

APPENDIX B

Matrix of Household Livelihood Options

On a separate sheet of paper, ask respondents to mention all of their main livelihood options, and assess each livelihood options by allocating a fixed number of stones or chips (100 pieces) between the various livelihood options and criteria to show the relative preference weighting of each option and criteria.

Current livelihood options	Criteria				Total
	Income Generation	Home consumption	Security during crisis/shocks	Good for the environment	
Total					100

Potential livelihood options	Criteria			Total
	Income Generation	Home consumption	Good for the environment	
Total				100

What kind of conditions do you need to fulfil potential livelihood options?

APPENDIX C: THE INSTITUTIONAL DESIGN, PERFORMANCE, AND INTERPLAY OF THE PFES PROGRAM

APPENDIX C.1: Interview questions with the Hoa Binh hydropower company

PFES implementation

1. What was the motivation behind implementing PFES in your point of view?
2. Why do you participate in the *PFES Program*?
3. Explain me how do you involve in the *PFES Program* (e.g., involving in designing PFES rules, in monitoring and verification on the ground)?
4. How has the level of payment been negotiated? Who involved in designing the level of payment? Were there any opposite opinions occurred during the discussion? If yes, how were they resolved?
5. How high was the payment? How was it monitored?
6. What does the *PFES Program* entail pertaining to promoted land use as conditionality of payments?
7. What were advantages and disadvantages of monitoring and verification mechanism that is implemented by only intermediaries?
8. How was information of PFES' implementation tracked and shared among relevant actors in the past 12 months?

Evaluation

9. Are PFES payments enhancing/incentivizing forest protection practices on the ground? At which level in comparison with non-PFES case?
10. How do you evaluate sustainability of forest environmental services provision? What should be done to achieve a sustainable provision of forest environmental services?
11. What are challenges/difficulties to implement the *PFES Program*?
12. How do you perceive costs and benefits of your participation in the PFES scheme (in relation to the payment and quality of forest protection practices)?
13. How do you evaluate financial sustainability of the *PFES Program*? What should be done to achieve a sustainable fund for the program?
14. How do you perceive impact of the *PFES Program* on operation of hydropower plants?
15. Which aspects of the program should be improved? What are your suggestions to improve?

APPENDIX C.2: Interview questions with intermediaries

PFES characteristics

1. What are reasons for the implementation of the *PFES Program* in Hoa Binh province?
2. When did Hoa Binh province start implementing the *PFES Program*?
3. Who are providers and users of forest environmental services in Hoa Binh province?
4. What are targets of PFES at Hoa Binh provincial-level?
5. How have these targets been achieved?
6. What are decisive factors that affect lower or higher achievement?
7. How many farmers participate in the PFES scheme?
8. Is farmer's participation voluntary? If not, how many percent of voluntary farmers?
9. What does the *PFES Program* entail pertaining to promoted land use as conditionality of payments?
10. Are farmers obliged to use the PFES payment for predefined activities (e.g., reforestation)?
11. How many households are refused to get the payment from the beginning of the program up to now? What are the main reasons?

Institutional set up of the PFES Program

12. Which PFES rules are designed at Hoa Binh provincial-level?
13. Who shaped which PFES rules (e.g., administrative cost, the level of payment)? Have PFES rules ever been changed? If yes, how and why?
14. How much money has been distributed to Hoa Binh province up to now (please specify by year)? How is money that is collected from electricity consumers' contribution transferred through various government bodies before it is distributed as the payment to farmers? How is it monitored?
15. Who is responsible for monitoring and verification of forest protection, and for distribution of money to farmers on the ground?
16. How information of the PFES implementation is shared among relevant actors?
17. What are the most challenges encountering PFES rules design and implementation (e.g., coordination, organization, staff, expertise)? Were there any opposite opinions occurred while designing PFES rules? How were they resolved?
18. Which factors facilitate PFES rules design and implementation? How do they facilitate?
19. Which existing policies (i.e., non-PFES policies) at both national- and provincial-levels have complemented the *PFES Program's* design and implementation? How do they complement (e.g., one-way or mutual complement, which one is dominant)?
20. Which existing policies (i.e., non-PFES policies) at both national- and provincial-levels have conflicted to/impeded the *PFES Program's* design and implementation? How do they conflict (e.g., in regard to targets, technical instruments, approaches)?

PFES on the ground

21. Explain me how the PFES system worked during the past 12 months?
22. How was the PFES's contract made on the ground?
23. How was the performance of forest protection on the ground monitored? What were the difficulties in monitoring?
24. How was the quality of forest protection practices on the ground evaluated/verified? What were the difficulties in evaluating/verifying the quality of service?

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25. How high was the level of payment? What was the method of payment? When was it made? How was it monitored?
26. How were non-compliance cases punished (e.g., forest fire, failure to meet contract's requirements)?
27. Were there any conflicts arising in the implementation of the *PFES Program* on the ground (e.g., among departments, between implementing authorities and farmers)? How were they resolved?
28. How did informal institutions at village-level (e.g., the village headman, the village's management organization, rules, norms, values) facilitate the implementation of PFES on the ground?
29. How did informal institutions at village-level (e.g., the village headman, the village's management organization, rules, norms, and values) impede the implementation of PFES on the ground?

Evaluation

30. How do farmers perceive the *PFES Program*? What are the main reasons of their participation in the program?
31. Are PFES payments enhancing/incentivizing forest protection practices on the ground? At which level in comparison with non-PFES case?
32. How do farmers perceive the impact of the *PFES Program* on forest protection and on improving their livelihoods?
33. How do you evaluate sustainability of forest environmental services provision? What should be done to achieve a sustainable provision of forest environmental services?
34. How do you evaluate financial sustainability of the fund for PFES? What should be done to achieve a sustainable fund for the program?
35. How would you get the users of environmental services those are administrated by Hoa Binh Provincial People's Committee involved in the *PFES Program*?
36. What did you learn from the piloted *PFES Program* in Lam Dong and Son La provinces?
37. Which aspects of the *PFES Program* should be improved? What are your suggestions to improve?

APPENDIX C.3: Interview questions with service providers - communities

1. Village profile in 2013 (Interview with the village headman)

- 1) Village foundation:
- 2) Distance to the center of commune and district (in km):
- 3) Number of people:
- 4) Number of household:
- 5) Ethnic composition:
% Thai;% H'Mong;% Kinh;% Dao;% Tay;% Muong;% other
- 6) The percentage of poor household:
- 7) Current land use

Land use	Area (ha)	Land use	Area (ha)
Total land area		5. Protected forest land	
1. Agricultural land (except for rice)		6. Production forest land	
2. Paddy rice		7. Residential land	
- irrigated and planted twice a year		8. Unused land	
- irrigated and planted once a year		9. Other land	
3. Upland rice		10. Area is registered in PFES	
4. Water surface of aquaculture			

- 8) Characteristics of household groups in the village (Focus group discussion)

Characteristics	The poor	The middle	The better-off
1. Type of house (roof, wall, floor, size)			
3. Number of labor			
4. Number of people in the family			
5. Number of main cattle (e.g., cow, buffalo)			
6. Agricultural land (sq.m)			
7. Forest land (sq.m)			
8. Number of motorbike			
8. Number of months in an average year with the food shortage			
9. Possession of the poor certificate			
10. Three main sources of income (ranking)			
11. Total income per average year			

2. Access to facilities (Interview with village headmen)

- 1) **Services:** Is there any following services currently available in your village?

Service	1. Quantity (if there is no service, write 0)	2. If "0", how far to the closet service (km)
1. Post office		
2. Market		
3. Telephone service		
4. Health center/clinic		
5. Kindergarten		
6. Primary school		
7. Secondary school		
8. High school		

2) Road

1. Is there a paved road passing by your village?
2. If “No”, how far to reach the closet paved road in walking minutes? (minutes)
3. For how many months in a normal year is your village accessible by truck? (months)

3) National electricity

1. How many households do not have electricity at all?

4) Drinking water

1. What are the three primary sources of drinking water in your village?
2. How many households use tap water as the primary source of drinking water?

3. Livelihood activities (Focus group discussion)

Which current livelihood activity contributes most to households’ income in your village?

Activity	Brief description	2013 ranking (ranking from 1-9, of which number 1 is the most important)
Low land cultivation	Two main crops:	
Upland cultivation	Two main crops:	
Perennial plantation	Two main trees:	
Forest land production	Two main trees:	
PFES payment		
NTFPs collection	Main products:	
Livestock	Two main livestock:	
Aquaculture	Main types of aquaculture:	
Other (labor wage, aquaculture, home garden, etc.)		

4. PFES implementation (Focus group discussion)

4.1. Enrolment process

- 1) What does your village know about the *PFES Program*? How does your village know?
- 2) Which year did your village enroll in the *PFES Program*? Is it a voluntary enrolment?
- 3) How large is your village’s registered forest area under the *PFES Program*? (sq.m)
- 4) What are criteria for being enrolled in the *PFES Program* (e.g., possession of the Red Book, having village regulations on forest protection and village plan of forest management)
- 5) How was your village’s enrollment process taken place? What were difficulties in the enrollment?

4.2. Desirability

- 1) How do farmers in your village perceive the *PFES Program*?
- 2) Why does your village participate in the *PFES Program*?

4.3. Social capital

- 1) What did village members discuss before enrollment in the *PFES Program*?
(e.g., establishment of management board, forest guard groups, village regulation formulation, and distribution method of benefits)
- 2) Who **from outside the village** help your village to understand the program, to enroll in the program, and to provide technique for forest protection? How do they help?
(Hint: if the interviewee says no one, please ask them the help from following actors: the provincial management board’s official, commune authorities, and commune extensions worker)

4.4. Land title

- 1) Does your village have the Red Book for registered forest area under the *PFES Program*?

- 2) Does your village think there will be a reallocation of forest land in your village before the end of the Use Right period (*most cases likely before 2044*).
- It is very likely to occur.....1
- It is likely to occur.....2
- It is unlikely to occur.....3
- It will definitely not occur.....4

5. PFES implementation

- 1) How high was the payment per ha per year in the past 12 months? What was the method of payment? When was it made?
- 2) Which activities did your village spend the PFES payment for in the past 12 months? Otherwise, how was it distributed among villagers?
- 3) Has your village ever been refused to receive the payment? If yes, what were the reasons (e.g., forest damage due to fire and/or cattle)?
- 4) How did your village patrol/monitor forests in the past 12 months (i.e., how did your village assign the task of patrolling forests among households in the village, how often did you go to patrol forests)?
- 5) Were there any conflicts/difficulties in labor assignment for patrolling forests? Which conflicts? How were they resolved?
- 6) Does your village receive technical support under the *PFES Program* (e.g., forest fire prevention techniques)? If yes, please specify: which topics, when, and how many people attending?
- 7) What are the three most difficulties in forest protection?
(e.g., *the low payment for forest protection, illegal logging, time consuming*)
- 8) What is difference between your village’s performance on forest protection under the *PFES Program* and those under *Program 661*?
- 9) How did the contractor (i.e., provincial management boards) monitor your village’s forests in the past 12 months (pertaining to the method of monitoring, monitoring frequency, and people involved in monitoring)?
- 10) How did the contractor (i.e., provincial management boards) verify your village’s forests in the past 12 months (pertaining to the method of verification, verification frequency, and people involved in verification)?
- 11) Whether any conflicts that had arisen as a result of forest protection from the beginning of the program up to now? Which conflicts? How were they resolved?
(e.g., *boundary conflict, forest’s damage due to cattle, conflicts with program’s officers in regard to signing contract and the payment, conflicts among villagers due to the method of money distribution*)
- 12) What did your village gain from forest protection in the past 12 months (e.g., PFES payment, NTFPs)? How did you distribute NTFPs among community members?
- 13) How does your village perceive costs and benefits of your participation in the *PFES Program* (in relation to access to land, labor availability, cash/payment, etc)?
- 14) Which programs households in your village have been being supported from the central government and from Hoa Binh provincial government in the last recent five years (2009-2013)?
(*Hint: the interviewer may start asking from the last year 2013*)

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	Program 1	Program 2	Program 3
1. Program name			
2. Types of support			
3. Period of receiving support			
4. How has the program complemented/supported - your enrollment in PFES - your performance of forest protection			
5. How has the program conflicted with/impeded - your enrollment in PFES - your performance of forest protection			

15) How did the village's rules, regulations, social norms, values and practices, and the role of village headman facilitate the implementation of the *PFES Program*?

16) How did the village's rules, regulations, social norms, values and practices, and the role of village headman impede the implementation of the *PFES Program*?

6. PFES evaluation

- 1) What does your village NOT LIKE the most about the *PFES Program*?
- 2) What does your village LIKE the most about the *PFES Program*?
- 3) Are payments incentivizing your village's forest protection practice? At which level of enhancement in comparison with non-PFES case?
- 4) How does your village perceive the impact of the *PFES Program* on forest protection and on improving households' livelihood in the village?
- 5) If the government stops the *PFES Program*, would your village continue to protect forests? Why or why not?

APPENDIX C.4: Interview questions with service providers – households

Date _____

Household head _____

Village _____

Name of respondent _____

Commune _____

Mobile number _____

Ethnic group of household head:

1 – Kinh 2 – Muong 3 – Dao 4 – Tay 5 – Thai 6 – Other _____

1. Demographic profile

ID	1.1 Relation to hh head (code 1)	1.2 Sex 1= Male 2= Female	1.3 Age	1.4 Can read/write Yes=1 No= 0	1.5 Highest class passed (code 2)	1.6 <i>If > 6 years Old</i> Main occupation in the past 12 months (code3)	
						Primary	Secondary
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							

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<i>Code 1 Relation to the household head</i>		<i>Code 2 Education</i>	
Household head.....	1	Never attended school or not yet attend school.....	0
Spouse.....	2	Attended school but did not finish primary school.....	1
Son or daughter or son in law or daughter in law.....	3	Primary degree.....	2
Father or mother.....	4	Secondary degree.....	3
Grandparent.....	5	Vocational diploma.....	4
Grandchild.....	6	High school certificate.....	5
Brother or sister.....	7	3year-college degree.....	6
Other relative.....	8	Bachelor (university) degree.....	7
Other non relative.....	9	Master and more.....	8
<i>Code 3 Occupation</i>			
Self employed in agriculture.....	1		
Self employed in non-farm enterprise...	2		
Student/pupils.....	3		
Government employee.....	4		
Salaried worker in agriculture.....	5		
Salaried worker in non agriculture.....	6		
Daily agricultural labor.....	7		
Daily non agricultural labor.....	8		
Military service.....	9		
Unemployed.....	10		
Disabled.....	11		

Note to the interviewer: A household consists of all people who live under the same roof, eat from the same pot and share expenditures. A person is not considered as a member if he/she spent more than 3 months away in the past 12 months

Interviewer:

2. Assets, housing, credit and social capital

Assets type and code	2.1. Number owned	Assets type and code	2.1. Number owned
1. Buffalo		8. Television	
2. Cow		9. Refrigerator or freezer	
3 Goat		10. Radio/cassette player	
4. Pig		11. Gas/electric stove	
5. Poultry (chicken, duck, etc)		12. Boat	
6. Motorbike		13. Motor tiller/ Plough	
7. Bicycle			

2.2. What is your primary source of lighting?	1 – Electricity 2 – Battery lamp 3 – Gas, oil, kerosene lamps 4 - Other
2.3. What type of cooking fuel source is primary used?	1 – Wood 2 – Leaves/grass/rice husk/stubble/straw/thatch/stems 3 – Coal/Charcoal 4 – Bottled gas 5 – Electricity 6 - Other
2.4. What is your primary source of drinking water?	1 – Tap water 2 – Private well 3 – Public well 4 – Rainwater collection barrel 5 – Spring water 6 – River/pond/lake 7 - Other sources

2.5. Questions on credit constraint.	Formal organization (VBARD, VBSP, village board, mass organization, NGO) Yes=1, No=0	Informal source (Private moneylender, shopkeeper, fertilizer dealer, relative, friend/neighbor, etc.) Yes=1, No=0
1) Did any member in your household apply for a loan from (source) in the past 12 months?		
2) If your household applied, was the loan granted?		

2.6. If household members did not attempt to borrow what are the main reasons? (Up to 3 reasons is possible)

I did not need credit.....1

Do not have enough information on how to get loan.....2

Do not know anyone to borrow from.....3

The banks/the lenders are too far.....4

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- The procedure is too complicated.....5
- No guarantor.....6
- I dislike any borrowing.....7
- Other reasons (specify).....8

2.7. Did your household receive poor certificate from commune in.....?

- Yes.....1
 - No.....2
 - Do not know.....3
- ...2009?
 ...2010?
 ...2011?
 ...2012?
 ...2013?

2.8. Did your household experience food shortage in the past 12 months?

- Often true (happen more than 180 days)1
- Sometimes true (happen less than 180 days)2
- Never true (never happen)3

3. Land use in the past 12 months

	1. Total cultivated area (TCA) (sq.m) (TCA = cultivated area in one season * number of crop season per average year)	2. Two main current trees	3. If rented/leased out, how much per year did you pay/receive for how many sq.m?
1. Paddy rice land			
2. Upland rice			
3. Other agricultural land (e.g., maize, cassava, arrowroot, etc.)			
4. Perennial trees			
5. Aquaculture			
6. Forest land	Total area:		
6.1. Natural forest area	Total area:		
6.2. Area for planting forest	Total area:		
6.2.1. With planted forest	Total area:		
6.2.2. Without forest	Total area:		

- If the household does not have forest land at all, go to section 7 and 8.3

- If the household has forest land for planting forest but does not plant forest (i.e., “6.2.1” = 0), go to section 7 and 8.1

4. Participation in the PFES Program

(For those having planted forest)

Does your household participate in the PFES Program? (Instead, the interviewer can also ask, “Did your household receive money for forest protection from MB2 last year?”)

- Yes..... 1 (ask all the following questions, except Section 8)
- No.....0 (go to Question 4.4.1 - 4.4.6, then go to Sections 7 and 8.2)

4.1. Enrollment process

- 1) What does your household know about the *PFES Program*? How does your household know?
- 2) Which year did your household enroll in the *PFES Program*? Is it a voluntary enrollment?
- 3) How large is your household’s registered forest area under the *PFES Program*? (sq.m)
- 4) What are two primary types of trees in the enrolled area?
- 5) Which year did your household plant those types of trees? (year)
- 6) Which source of investment in planting those types of trees?
(*hint: from which national program or from your own money*)
- 7) What are criteria for being enrolled in the *PFES Program* (e.g., possession of the Red Book)?
- 8) How was your household’s enrollment process taken place? What were difficulties in the enrollment?

4.2. Desirability

- 1) How does your household perceive the *PFES Program*?
- 2) Why does your household participate in the *PFES Program*?
- 3) Does your household loose other income opportunities (e.g., hiring out labor) because of participating in the *PFES Program*?
- 4) If the answer of Question 4.2.3 is “Yes”, which income lost? How many days per month are lost? How many months per average year can you have this opportunity?
(*Please ask for per family member per each opportunity*)
- 5) If the answer of Question 4.2.3 is “Yes”, why did you decide to participate in the *PFES Program* instead of doing one of among other options above?

4.3. Social capital

- 1) What did you discuss with other family members before enrollment in the *PFES Program*?
(*e.g., family labor distribution between forest protection and other agricultural activities, labor assignment to patrol forests*)
- 2) Who **from outside the village** help you to understand the program, to enroll in the program, and to provide technique for forest protection? How do they help?
(*Hint: if the interviewee says no one, please ask them the help from following actors: the provincial management board’s official, commune authorities, and commune extensions worker*)
- 3) Who **from the village** help you to understand the program, to enroll in the program, and to provide technique for forest protection? How do they help?
(*Hint: if the interviewee says no one, please ask them the help from following actors: the village headman, neighbors, relatives, Farmer Union, and Women Union*)

4.4. Land title

- 1) Has your household received a Red Book for forest land?
 Yes.....1
 No.....0
- 2) If the answer of Question 4.4.1 is “Yes”, when did you receive?.....Year
- 3) If the answer of Question 4.4.1 is “Yes”, how did the possession of the Red Book for forest land affect your decision to participate in the *PFES Program*?

- 4) If the answer of Question 4.4.1 is “No”, what were difficulties in your enrollment without having the Red Book?
- 5) If the answer of Question 4.4.1 is ‘No’, has your household applied for a Red Book for forest land?
 Yes..... 1
 No.....0
- 6) If the answer of Question 4.4.5 is ‘No’, what are the main reasons?
- 7) Do you think there will be a reallocation of forest land in your village before the end of the Use Right period (*most case likely before 2044*).
 It is very likely to occur.....1
 It is likely to occur.....2
 It is unlikely to occur.....3
 It will definitely not occur.....4
- 8) What do you think would happen to your forest land after the end of use right period?
 I still can use the same land (but perhaps need to extend certificate)..... 1
 I will be reallocated with a smaller forest land of land.....2
 It is very hard to tell..... 3

5. PFES implementation

- 1) How high was the payment per ha per year in the past 12 months? What was the method of payment? When was it made? Which activities did your household spend the PFES payment for in the past 12 months?
- 2) Has your household ever been refused to receive the payment? Is yes, what were the reasons (e.g., forest damage due to fire and/or cattle)?
- 3) How did you patrol your forests in the past 12 months?
- 4) How did you distribute family labors to forest protection and to other agricultural production activities (e.g., maize cultivation, cattle grazing, and aquaculture, etc.)? Were there any conflicts/difficulties in labor distribution among activities? How were they resolved?
- 5) Do you receive technical support under the *PFES Program* (e.g., forest fire prevention techniques)? If yes, please specify: which topic, when, and how many people attending?
- 6) What are the three most difficulties in forest protection?
(e.g., the low payment for forest protection, illegal logging, time-consuming, labor unavailability)
- 7) How did the contractor (i.e., provincial management board) monitor your forests in the past 12 months (pertaining to the method of monitoring, monitoring frequency, and people involved in monitoring)?
- 8) How did the contractor (i.e., provincial management board) verify your forests in the past 12 months (pertaining to the method of verification, verification frequency, and people involved in verification)?
- 9) Whether any conflicts that had arisen as a result of forest protection from the beginning of the program until now? Which conflict? How were they resolved?
(e.g., conflicts with neighbours about the boundary and forest’s damage due to cattle, with program’s officials related to signing contract, payment, etc.)

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10) Benefit from forest protection in the past 12 months

Product	Quantity (kg)	Of which, quantity from			Home consumption (kg)	Sold (1000 VND)
		area enrolled under PFES (%)	natural forest of the village (%)	other sources (home garden, river) (%)		
1. Acacia						
2. Adult bamboo						
3. Bamboo shoot						
4. Mushroom						
5. Medicines						
6. Firewood						
7. Others						

11) How do your household perceive costs and benefits of your participation in the *PFES Program* (in relation to access to land, labor availability, cash/payment)?

12) Which programs has your family been being supported from the central government and from Hoa Binh provincial government in the last recent five years (2009-2013)?
(Please ask for per family member per program; the interviewer may start asking from the last year, 2013)

	Program 1	Program 2	Program 3
1. Program name			
2. Types of support			
3. Period of receiving the support			
4. How has the program complemented/supported - your enrollment in PFES - your protection of forest			
5. How has the program conflicted with/impeded - your enrollment in PFES - your protection of forest			

13) How did the village's rules, regulations, social norms, values and practices, and the role of village headman facilitate your implementation of the *PFES Program*?

14) How did the village's rules, regulations, social norms, values and practices, and the role of village headman impede your implementation of the *PFES Program*?

6. PFES evaluation

- 1) What do you NOT LIKE the most about the *PFES Program*?
- 2) What do you LIKE the most about the *PFES Program*?
- 3) Are payments incentivizing your household's forest protection practice? At which level of enhancement in comparison with non-PFES case?
- 4) How do you perceive the impact of the *PFES Program* on forest protection and on improving your household livelihood?
- 5) If the government stops the *PFES Program*, would your household continue to protect forests? Why or why not?

7. Household income and expenditure in the past 12 months

- 1) What were three most income sources in the past 12 months (including home consumption and sold)

Food expenditure

Item	Value
2) How much do you spend on average to purchase food to consume at home in one day?	- Rice:(VND) - Food eaten with rice:(VND)
3) How many months in the past 12 months did your household consume food (rice, maize, cassava, sweet potato, vegetable, livestock, fruit, etc) that you grew or produced at home?(number of months)
4) What was the value of the food you consumed in a typical month from your own production? (approximately)(VND)

Non-Food expenditure

- 5) How much did your household spend on the following items during the past 12 months?

Item	Value (VND)
1. Clothing and footwear	
2. Personal care items and services (soap, shampoo, toothpaste, cosmetics, detergent, haircut	
3. School expenses and fees	
4. Medicine, hospital and other heal related issues	
5. Buying gold or jewellery	
6. Household furniture and appliances	
7. Vehicle	
8. Others	

8. Non-participant in PFES

8.1. For those having forest land but do not plant forest

- 1) What did you do with your forest land in the past 12 months (e.g., rented out, agricultural crops cultivation, etc.)?
- 2) Have you ever thought about planting forest? If no, why is that? If yes, what is preventing you from adopting forest plantation?

8.2. For those having forest land and having planted forest but do not participate in PFES

- 1) What is preventing you from enrolling in the *PFES Program*?

8.3. For those do not have forest land

- 1) Why does not your household have forest land?
- 2) Do you think there will be a reallocation of foret land in your village?
 - It is very likely to occur.....1
 - It is likely to occur.....2
 - It is unlikely to occur.....3
 - It will definitely not occur.....4

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- 3) If the answer of Question 8.3.2 is 1 or 2, what do you think would happen to your household when reallocation of forest land?
- I will be allocated forest land1
- I won't be allocated forest land.....2
- It is very hard to tell.....3
- 4) If the answer of Question 8.3.3 is 1 or 2, why do you think so?
- 5) Have you ever thought about planting forest? If no, why is that? If yes, what is preventing you from adopting forest plantation?
- 6) Did your household receive money for protection of your village' common natural forests? If "Yes", was it the same with other households in the village?
- 7) How did your household involve in the protection of your village's common natural forests in the past 12 months?

AUTHOR'S DECLARATION

I hereby declare that this doctoral dissertation is a result of my own work and that no other than the indicated aids have been used for its completion. All quotations and statements that have been used are indicated. Furthermore, I assure that the work has not been used, neither completely nor in parts, for achieving any other academic degree.

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