# PRACTICES OF A NON-STATE MEDIATED PAYMENT FOR ECOSYSTEM SERVICE PILOT PROJECT, MAE SA WATERSHED, NORTHERN THAILAND

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## MASTER OF ARTS
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# PRACTICES OF A NON-STATE MEDIATED PAYMENT FOR ECOSYSTEM SERVICES PILOT PROJECT IN MAE SA WATERSHED, NORTHERN THAILAND

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*To*

those who see complexity in the calamities of this planet and
still continuously turn towards compassionate and humble
thought, speech and action;
that all the creatures of existence might be
healthy, at peace and free.

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# ABSTRACT

This research contributes to the understanding of the practices of payment for ecosystem service (PES) projects and their potential usefulness in restoring watershed forests in northern Thailand. The case study is a two-year pilot project in the Mae Sa watershed where a local bottled water company made payments to a nearby village for their efforts to restore a small plot of degraded watershed forest. From the assessment of project documents and government reports, along with formal interviews and informal conversations with the PES buyer and service providers, local forestry experts, third party mediators and their supervising non-governmental organization, the research outlines the operational process of the agreement and the mechanisms that were developed.

The research looks beyond the survival rate of trees to analyze how a small-scale PES pilot project may have influenced existing dynamics of control in the contested landscape of northern Thai watershed forests. The progressive changes in local spatial power in terms of territoriality are examined, both before and after the introduction of the project. The findings show that the project may have simultaneously increased the legitimacy of local land users as forest managers, while also reinforcing the government's

claim of ownership to the land. New expertise on how to negotiate a PES project and new forest restoration practices were adopted and gained legitimacy among local stakeholders.

The realities of a PES project in the field differed in several ways from the PES concept. In this project, a clearly defined ecosystem service was not bought and sold and people did not participate due to expectation of economic incentives. This research suggests that concerns about the local water supply and fire prevention were more influential in motivating participation than financial gain. Local participants adapted the goals of PES to their local context and saw it as an opportunity to build alliances with neighboring villages and with local and state officials.

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| **หัวข้อวิทยานิพนธ์** | ปฏิบัติการของโครงการนำร่องการจ่ายค่าตอบแทนบริการระบบนิเวศที่สื่อประสานโดย |
| | หน่วยงานนอกภาครัฐ ในพื้นที่ลุ่มน้ำแม่สา ภาคเหนือของประเทศไทย |
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**บทคัดย่อ**


     งานวิจัยนี้ก่อให้เกิดความเข้าใจต่อปฏิบัติการของโครงการจ่ายค่าตอบแทนการให้บริการของระบบนิเวศ (PES) และศักยภาพที่เอื้อประโยชน์ในการรักษาป่าลุ่มน้ำในภาคเหนือของประเทศไทย งานวิจัยนี้เลือกกรณีศึกษาโครงการนำร่องระยะสองปีในบริเวณลุ่มน้ำแม่สาที่บริษัทน้ำบรรจุขวดในพื้นที่จ่ายค่าตอบแทนบริการระบบนิเวศให้แก่คนในหมู่บ้านใกล้เคียงสำหรับความพยายามในการฟื้นฟูลุ่มน้ำในพื้นที่ป่าเสื่อมโทรม โดยการรวบรวมเอกสารประเมินโครงการต่าง ๆ จากรายงานภาครัฐ จากการสัมภาษณ์ทั้งอย่างเป็นทางการและจากการพูดคุยแบบไม่เป็นทางการกับกลุ่มผู้ซื้อที่ได้รับผลประโยชน์จากระบบนิเวศและผู้จัดหาบริการ รวมทั้งผู้รู้เรื่องป่าชุมชนในท้องถิ่น ตัวผู้ประสานและองค์กรนอกภาครัฐที่ให้คำปรึกษา งานวิจัยได้นำเสนอกระบวนการในการดำเนินงาน ข้อตกลง และกลไกต่าง ๆ ที่ได้ถูกพัฒนาขึ้นจากโครงการจ่ายค่าตอบแทนบริการระบบนิเวศ


งานวิจัยได้วิเคราะห์ตัวโครงการนำร่องขนาดเล็กที่จ่ายค่าตอบแทนการให้บริการของระบบนิเวศ ไปมากกว่าการพิจารณาจากอัตรารอดของจำนวนต้นไม้ ทว่าโครงการดังกล่าวอาจส่งผลกระทบต่อพลวัตของการควบคุมพื้นที่ซึ่งมีการช่วงชิงในบริเวณลุ่มน้ำภาคเหนือของไทย งานวิจัยได้มองความก้าวหน้าของการเปลี่ยนแปลงของอำนาจท้องถิ่นในการร่วมกำกับขอบเขตของคนในท้องถิ่นทั้งก่อนเริ่มและหลังการดำเนินโครงการ งานวิจัยพบว่า ระหว่างการดำเนินโครงการทำให้คนในชุมชนมีสิทธิอำนาจชอบธรรมมากขึ้นในการบริหารจัดการขอบเขตการใช้พื้นที่ป่า แต่ในขณะเดียวกันรัฐก็พยายามตอกย้ำความเป็นเจ้าของพื้นที่ นอกจากนี้คนในชุมชนใช้ความเชี่ยวชาญ ทักษะในการต่อรองกับตัวโครงการ รวมถึงปฏิบัติการในการฟื้นฟูป่าแบบใหม่ ๆ ถูกนำมาปรับใช้เพื่อเป็นการเพิ่มความชอบธรรมให้แก่ผู้มีส่วนได้ส่วนเสียร่วมกันในชุมชน

ความเป็นจริงของโครงการในภาคสนามมีความแตกต่างออกไปจากแนวคิดการจ่ายค่าตอบแทนการให้บริการของระบบนิเวศ คำจำกัดความที่กำหนดไว้ชัดสำหรับการบริการระบบนิเวศนั้น สำหรับโครงการนี้ไม่ได้ถูกนำมาใช้ซื้อ-ขาย คนในชุมชนไม่ได้เข้าร่วมโครงการเพราะคาดหวังผลตอบแทนทางเศรษฐกิจ งานวิจัยเสนอให้เห็นความสำคัญของการรักษาแหล่งน้ำ การป้องกันไฟป่า ว่ามีอิทธิพลจูงใจในการมีส่วนร่วมมากกว่าเงินค่าตอบแทน ผู้เข้าร่วมในท้องถิ่นได้ปรับประยุกต์เป้าหมายของโครงการฯให้เข้ากับบริบทของท้องถิ่นตน และมองเห็นเป็นโอกาสเพื่อสร้างเครือข่ายกับหมู่บ้านใกล้เคียง เจ้าหน้าที่องค์กรบริหารส่วนท้องถิ่น รวมถึงเจ้าหน้าที่หน่วยภาครัฐ

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# LIST OF ABBREVIATIONS

| | |
|---|---|
| AURA PES | Aura Payment for Ecosystem Services Pilot Project |
| BEDO | Biodiversity-Based Economy Development Office |
| CLT | Community Land Titles |
| CSR | Corporate Social Responsibility |
| DNP | Department of National Parks, Wildlife and Plant Conservation |
| GPS | Global Positioning System |
| FORRU | Forest Restoration Research Unit, Chiang Mai University |
| GHG | Greenhouse Gas |
| KTC | Kor Thor Chor Program |
| LEAF | Lowering Emissions in Asia's Forests |
| MAB | Man and Biosphere |
| NGO | Non-Governmental Organizations |
| ONEP | Office of Natural Resource and Environmental Policy and Planning |
| PES | Payment for Ecosystem Services |
| REDD+ | Reducing Emissions from Deforestation and Forest Degradation |
| RFD | Royal Forestry Department |
| SNV | Netherlands Development Organization |
| UNESCO | United Nations Educational, Scientific and Cultural Organization |
| UNFCCC | United Nations Framework Convention on Climate Change |
| USAID | United States Agency International Development |

1 US dollar = approximately 33 Thai baht

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# CHAPTER 1

# Introduction

## 1.1. Background

In 2015, Lowering Emissions in Asia's Forests (LEAF) initiated a small-scale payment for ecosystem services (PES) pilot project in the Mae Sa watershed in northern Thailand which is the case study for this research. This PES pilot project supported the efforts of local residents to restore an area of watershed forest in relation to the water related ecosystem services this forest provides. The United States Agency for International Development (USAID) was the sole funder of LEAF which was primarily managed by Winrock International and worked in collaboration with the Thai Department of National Parks, Wildlife and Plant Conservation (DNP).

In Thailand, forests are very much a collision point between state and traditional rural territorial ideologies. The government has not been successful in its progressive attempts to be the sole administer of property rights to natural resources (Vandergeest 1996). While some people do prefer state guaranteed property rights, particularly in highly commercialized areas or areas where people fear eviction, others do not recognize the state as a legitimate manager of the forests (Vandergeest and Peluso 1995, Isager and Ivarsson 2002, Ganjanapan 1998) and contest state mandates in both individual and organized ways (Wittayapak and Baird 2018, Hayami 1997, Isager and Ivarsson 2002). In reality, a hybrid system of both informal and official systems of natural resource management exists in which local practices

sometimes have little relation to the formal system, and in which what is written as law has limited implementation in practice (Kemp 1981, Ganjanapan 1994, 1998, 2003).

The Thai government has shown interest in piloting market-based natural resource governance schemes and at the time of this research the DNP was attempting to introduce pilot projects to assess the effectiveness of market-based partnerships in contributing to sustainable watershed forest management goals. In Thailand, changing state policies and understandings have meant that territorial boundaries are often ambiguous and unenforceable. The history of forest management in Thailand is very complicated and forests have had as much to do with controlling rural peoples' rights and behaviors as they have had to do with trees. For these reasons, new forest initiatives in northern Thailand have a variety of social implications and are prone to unexpected and unintended outcomes. This research will attempt to look beyond the survival rate of trees and analyze how a small-scale PES pilot project may have influenced existing dynamics of control in the contested landscape of northern Thai watershed forests.

When this research began, both the United States and Thai governments were engaged in the international discourse of climate change. The United States government under the Obama Administration identified carbon pollution as a threat to public health and the most important driving force of climate change (Council on Environmental Quality n.d.). It cited increased temperatures, floods, droughts and wildfires as some of the effects of carbon-driven climate change that are both costly and also pose public health threats (The White House n.d.). Similarly, in 2016, the Thai government reported that both climate change and increasing population had affected natural resources and the environment in Thailand, and that growth-oriented development had pushed ecosystems beyond their carrying capacity (National Economic and Social Development Board 2016). Some of the situations and risks believed to impact development in Thailand include the depletion of natural resources and

the degradation of the environment, global climate change and the associated tougher global regulations and obligations in regards to the environment (Termpittayapaisith 2014).

The Thai government considers the nation extremely vulnerable to the rising sea levels and extreme weather events such as increased tropical storms, droughts and floods predicted by climate change models (Office of Environmental Policy and Planning 2000). Thailand signed the United Nations Framework Convention on Climate Change (UNFCCC) in June of 1992 and the Kyoto Protocol in February of 1999 (ratified in March of 1995 and August of 2002, respectively). Figure 1.1 shows that that in 2000 the energy sector was estimated to contribute about 70 percent of total $CO_2$ emissions in Thailand, followed by 26 percent by the agriculture sector. The industrial, forestry and waste sectors combine to account for the remaining seven percent (Office of Environmental Policy and Planning 2000).
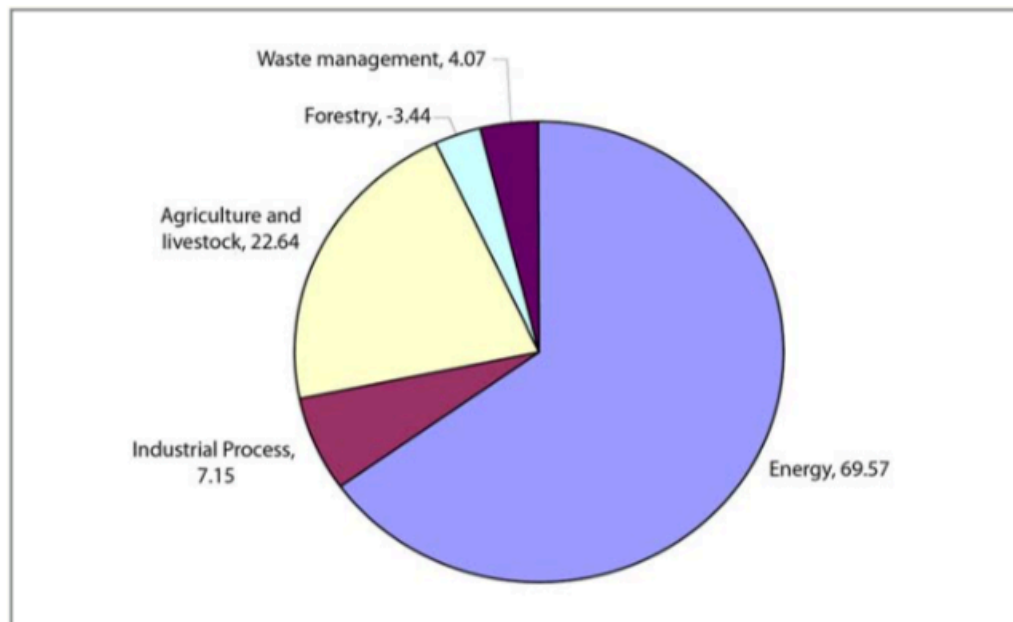


Figure 1.1 – Thai GHG emissions by source in $CO_2$ equivalent, for 2000 (%)
(Source: Office of Natural Resources and Environmental Policy and Planning 2010: 11)

While the energy sector was considered the leading contributor of $CO_2$ emissions in Thailand (ONEP 2010) and in the United States (Executive Office of the President 2013),

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both countries still acknowledged that forests have an important role to play. The Thai government stated that forests are both a source and a sink for $CO_2$ in that when forest land is cleared $CO_2$ is released, but trees left standing will store $CO_2$ through photosynthesis (Office of Environmental Policy and Planning 2000). On October 18, 2013, President Obama stated, "My Administration is committed to cutting carbon pollution in the United States, and safeguarding and restoring our forests will help us fulfill that mission" (Council on Climate Change Preparedness and Resilience 2014). Both countries share climate change mitigation strategies for the forest sector that include the protection of forests and promotion of reforestation in order to increase carbon sinks. Thailand and the United States do not, however, share a common context of state territorialization or consistent institutional frameworks for land tenure.

The 2016 Dakota Access Pipeline protests at Standing Rock Indian Reservation in the state of North Dakota are evidence that absolute state territoriality is still contested in the United States, but relative to Thailand the process of state territorialization is more normalized, consistent and complete. In Thailand, successive attempts at complete state territoriality have been unsuccessful in replacing traditional practices and have resulted in a landscape of 'legal plurality' or 'legal complexity' where traditional and state practices of territoriality have both been forced to evolve as they confronted each other (Ganjanapan 2003). Unfortunately, both the government and academics have often failed to consider local perspectives when defining what problems exist and how they should be solved (Ganjanapan 1987) and urban-based elite and rural-based farmers continue to differ in their visions of forest management, ownership and conservation (Chuask and Baird 2017).

Northern Thailand is the site of many historic human migrations, diverse cultures and varying types of agricultural and semi-nomadic practices that have not always intermix harmoniously. In 1987, Ganjanapan described the complexity of diverse local land use practices in Bo Kaeo subdistrict, Samoeng district in Chiang Mai province in relation to

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various ethnic groups living at three different elevations in the mountains that are common in the Mae Khan basin. The lower zone (located below 500 meters) was the smallest zone at 10 percent of the basin. It was densely populated with people and irrigated wet rice fields that had increasingly engaged in the market economy (Ganjanapan 1987).

The intermediate zone (between 500 and 1,000 meters) was the largest zone at 70 percent and characterized by small, wet terraced rice fields in the valleys, forest gardens of miang tea bushes and primarily subsistence agriculture (also known as shifting, rotational or slash-and-burn agriculture) upland. This middle zone was dominated by Thai, Thai Lue and Karen ethnic groups who had been living there for more than two centuries. Other than sales of miang tea and other small scale trading, market mechanisms were more recent introduced in this zone, starting after 1960 (ibid).

The Karen had a complex system of land use and land tenure which included rights of commonality. Lands such as swidden lands, animal grazing areas, reserved watershed areas and forest areas for hunting and gathering were allocated to families, often by a religious leader or the village headman. Usufruct rights which give individuals rights for a certain period of time were a customary practice. Wet rice fields, orchards, cash crop gardens and household compounds that were consistently used could be recognized as being under private ownership and could be inherited and sold. Right-holders could also agree to give temporary rights of use to other households and the Karen had a system to facilitate the transfer of land. The Karen had a functioning system of land tenure but it did not always align with that of the state or that of their neighbors (ibid).

While the Karen showed no obvious signs of conflict with the neighboring Thai and Thai Lue, they had experienced 30 years of almost continuous unfriendliness with the people that had migrated into the land at higher elevation. The upper zone located at the top of the watershed (20 percent of the basin which was above 1,000 meters) was considered the most

ecologically fragile. Though this zone was classified as reserved land by the Karen and by the state, in the 1980s it was encroached on by commercial exploitation and two minority ethnic groups, the Hmong and Lisu. These two groups had recently migrated there and introduced cash crops including opium. Producing cash crops on upper zone watershed land was counter to the Karen's customary land tenure practices and the use of slash-and-burn or swidden cultivation practices in the upper zone was believed to negatively impact their wet rice field productivity in the intermediate zone downhill (ibid). These examples start to show that local land use practices are culturally diverse and are sometimes incompatible with each other in the Samoeng district in Chiang Mai province. State and market interventions add another dimension to an already complex landscape.

Ganjanapan (1987) also described how the state's expectation that land tenure should be singular rather than allowing for communal private land ownership and state interventions like opium substitution programs in the upper zone had combined with growing market integration and cycles of indebtedness to undermine the Karen's ability to enforce their traditional land tenure system. In a frontier like situation, neither the state system nor the Karen's traditional systems were fully functioning and enforceable. The Karen in the intermediate zone were experience pressure as the state pushed opium growing highland people downhill and market and land pressures pushed lowland people uphill. These examples are meant to illustrate how both state and market interventions can have varying consequences for different people depending on the geographic area, or the elevation, where they live.

Perceptions of territoriality, land tenure and land use management among rural residents of northern Thailand were complex and diverse before the Thai state began to implement its own strategies of spatial control in the form of internal state territorialization. The state was fairly successful in implementing civil administration in rural areas; however, attempts to take over the administration of land rights and to control large portions of national

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territory through forest land classifications has been an uneven and unstable process that remains incomplete (Vandergeest and Peluso 1995). In Thailand, state and traditional rural territorial ideologies seldom align in regards to forest use, management and ownership. This dynamic will be explored in more detail in section 1.5.1 on spatial power in terms of territoriality.

This already complex situation can be further complicated as emerging environmental movements may result in local, national and global interests all simultaneously influencing land use practices and territorial claims that go beyond those delineated by individual nations (Luke 1995). How Thailand manages its natural resources has gained the attention of the international community because Thailand is a geographic zone with huge potential for both future ecological depletion and increased individual consumption. Transnational environmental groups and foreign governments are exerting new influences in their hope to promote what they deem to be appropriate conservation measures and the introduction of new forms of environmental governance interact with already complex and contested dynamics of control.

> "Thailand has lost more than half of its forests within the lifetime of one generation. An estimated 70 percent of the country was covered by forests in 1936. By 1952 the proportion had dropped to 58 percent and it declined further to 55 and 38 percent respectively in 1961 and 1973. …The Royal Forestry Department has claimed that the forest cover has stabilized at 25 percent. Other sources, however, maintain that in reality only about 15 percent of the country is forested. …more than half of the forested areas situated in Northern Thailand" (Isager and Ivarsson, 2002: 398).

International organizations such as Winrock International report that in the Asia-Pacific region "deforestation and forest degradation have been identified as major sources of

greenhouse gas (GHG) emissions in Southeast Asia and are significant contributors to global climate change" (Winrock n.d.). In the global discourse of climate change there is an emerging acknowledgement of the importance of the ecosystem services that forests provided, particularly in regards to their ability to sequester carbon, and an openness to financial incentive for forest conservation. Ecosystem services provided by forests are increasingly being incorporated into new policies and attempts are being made to tangibly link the monetary value of forest ecosystem services to rewards for the people who maintain and restore them. As a new environmental economic policy, payment for ecosystem services (PES) attempts to promote the belief that ecosystem services have value, and that behaviors that conserve and restore them should be economical rewarded (see section 1.5.1 on payment for ecosystem services for more detail).

PES projects can enable foreign governments and non-profit actors to have a growing influence over the resource management territorial strategies (Corson 2011). "Many contemporary environmental movements… push governmentality to a global [level]… beyond the territorial spaces created by nation-states" (Luke 1995: 77). The result is that local, national and global interests may all be simultaneously influencing land use practices and territorial claims. A web of public, private and non-profit actors is effectively remaking 'sovereigntyscapes' (Vandergeest and Unno 2012) of territorial boundaries and resource rights in alignment with their own distinctive needs (Corson 2011). This includes commercialization of ecosystem services such as flood and erosion prevention that were previously outside of the capitalist system (Corson 2011). The influence that the PES market mechanism has on renegotiating local and state dynamics in relation to contested claims over forest resource management is one focus of this research.

The case study for this research is a PES pilot project in the Mae Sa watershed, approximately 30 km northwest of Chiang Mai city in Chiang Mai province, northern Thailand. In this PES pilot project the Aura Mineral Water Company (Aura Company) and

participants from Pong Khrai village agreed to a PES partnership in which Aura Company made seven payments over a two-year period to Pong Khrai village participants for efforts to restore a 10 rais (1.6 hectares) plot of watershed forest land (Wongsa 2015b). The Aura Payment for Ecosystem Services Pilot Project (AURA PES), aimed to link economic value to the water related services provided by the watershed forests upland of the bottled mineral water source, and to offer economic support to Pong Khrai village participants for enhancing and maintaining those ecosystem services.

**1.2 Statement of the research problem and justification**

The new scientific understandings that have resulted from the global knowledge networks of climate change and carbon sequestration have been followed by new policies and tougher rules. In Thailand, there is hope that PES projects can help to both fulfill global climate agreements and to restore and conserve natural resources such as watershed forests through market-based partnerships. PES projects are a relatively new policy tool in Thailand and little research has been done yet to determine how effective they are at restoring and conserving watershed forests.

Market mechanisms like PES rely on certain types of land rights that may not translate well in northern Thailand where rural people have historically resisted private property initiatives mandated by the state. It is important to question whether PES projects in this context operate as a market mechanism in the way that is theoretically intended. Given the DNP's hopes to expand the implementation of PES projects and the increased potential for international funding mechanisms resulting from global climate agreements, it may be beneficial to understand how the concept of PES is being implemented in the field and how these projects interacts with the complex and contested landscape of forest land tenure in northern Thailand.

## 1.3 Research questions

1.3.1 What was the operational process of AURA PES and how are actors in this project negotiating for their own benefit?

1.3.2 What new environmental expertise resulted from the project and how was it promoted?

1.3.3 How has AURA PES influenced local perceptions of territoriality or impacted any existing territorial conflicts?

## 1.4. Research objectives

1.4.1 This research examined the operational process of AURA PES by identifying what stakeholders were involved, their motivations for participating in AURA PES and their expected outcomes. It investigated how the project mechanisms were developed and used.

1.4.2 Secondly, the research attempted to analyze how AURA PES interacted with the complex dynamics of state forest laws, local land use practices and perceptions of rights and ownership in the contested landscape of forests in northern Thailand in order to understand how the pilot project may have influenced existing dynamics of control.

1.4.3 Thirdly, given that the history of unstable territorial claims in Thailand's forests has often limited the effectiveness of conservation efforts the research assessed the effectiveness of AURA PES to restore watershed forest ecosystems in terms of tree survival rates at the completion of the project. It identified new expertise that were

promoted during the project and examined their impact on local practices to assess their potential usefulness to restore and conserve watershed.

1.4.4 Finally, I proposed that PES projects are bound up in the logic of markets; however, I attempted to demonstrate that in several ways the AURA PES project is not. The aim was to contribute to the understanding of how the theory of market-based natural resource governance was adapted in order to implement a project in the northern Thailand.

## 1.5 Literature Review

The key concepts of spatial power in terms of territorialization, environmentality and payment for ecosystem services are examined in this literature review. This is followed by a review of relevant case studies. The concepts will then be applied to form the conceptual framework of this research and applied to the investigation of the practices of a functioning PES pilot project.

### 1.5.1 Review of Concepts

#### 1) Spatial Power in Terms of Territorialization

Sacks (1986) conceptualized human territoriality as socially and geographically rooted rather than as biological motivations associated with animals. He saw territoriality as a form of strategic geographic behavior that aims to "affect, influence, or control resources and people, by controlling area" (1986: 1). For Sack, human territoriality is a spatial strategy, a form of spatial behavior, that could be turned on and off.

A geographic area not affected by access to resources and power is not considered a territory but instead an ordinary geographical place (Sacks 1986). An ordinary geographic area only becomes a territory when someone classifies it in a

certain way which must be communicated in at least some basic form and attempts made to influence interactions or enforce control of access. Territorial strategies reshape degrees of access for people and for activities within the area and result in some activities and people being welcome in a delimited area, while others are not. "Delimination becomes a territory only when its boundaries are used to affect behavior by controlling access" (Sacks 1986: 19).

Territorial sovereignty can be seen as the process that "defines people's political identities as citizens and forms the basis on which states claim authority over people and the resources within those boundaries" (Vandergeest and Peluso 1995: 255). Before the nation state of Thailand was created, local systems of resource claims could be maintained for generations using local enforcement (ibid). Vandergeest and Peluso (1995) outlined the history of territorial strategies the Thai state has undertaken in attempts to increase its control over the allocation of resource access rights within the national boundary while Vandergeest (1996) honed in on strategies attempted by the forestry sector. Many complex political, social and environmental events which influenced territorial processes within Thailand are not detailed in the broad strokes provided here.

Before the birth of Thailand as a nation, ordinary geographic (non-territorialized) areas existed in northern Thailand and power was centered more around people, for example conscripted labor, than on territorializing land. This conceptually changed for the state in 1899, when in response to expanding colonial pressures about 75 percent of the land area in present day Thailand was declared unoccupied and reclassified as state forests under the jurisdiction of the Royal Forestry Department (RFD) (Vandergeest and Peluso 1995). The Forest Conservation Law of 1913 allowed the RFD to require permits, fees or otherwise regulate forest products it deemed as 'reserved'. However, at first, 'reserved' classifications were limited to major commercially valuable forests products like teak (though detailed

regulations on products like beehives and tree resin were to follow) and access to most forest products was still mainly controlled by local influential people instead of by the state (Vandergeest 1996).

While the Thai state had claimed ownership for an enormous amount of 'unoccupied land' it did not yet communicate or attempt to enforce its boundaries on the many people who were in fact occupying these areas. Local people were not restricted from forests and the state still granted full rights of access to non-commercial forest products. During this time government policies actually encouraged clearing and cultivating of new land, including forest land, to encourage rice exports (Vandergeest and Peluso 1995).

Due to inadequate man power and the remote nature of many forests in Thailand the state had very limited ability to control the use of forest products within the national border (Vandergeest 1996). In a new strategy, the Thai state shifted from the complex system of controlling forest products towards simpler strategies of territorial control. In the Protection and Reservation of Forests Act of 1938 the Thai government first attempted to map and demarcate the land under the RFD's jurisdiction with the hopes that controlling land borders would be easier than controlling products. The state created two new forest classifications, 'protected forests' and 'reserved forests' and began the tremendous task of demarcating and mapping them. Burning and clearing land was now prohibited by the state in areas newly classified as 'protected forests. In areas newly classified as 'reserved forests' extracting *any* forest product now required state permits and grazing of animals was forbidden (ibid).

"Territoriality, …was not absent from the pre-national state or civil
society in Southeast Asia. Local people did have concepts of

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territoriality. …However, territoriality tended to be local – locally classified, locally communicated, and especially, locally enforced" (Vandergeest and Peluso 1995: 264).

In traditional systems of territorial rights in northern Thailand property rights were often associated with a product and not the land it was found on (Vandergeest 1996). Land agreements and demarcations relied on group memory but state administrators could not rely on group memory and instead used maps to represent and communicate territorial control. Rather than undertaking the difficult task of representing complex overlapping rights to products that existed locally the state began to focus on the task of controlling land rights within land boundaries that could be easily communicated on maps. For several decades, the enforcement of these new rules was very limited. The process of demarcating new classifications of land was very slow due to the complexity of the approval process which still included the input from local people (ibid).

The collision between state and traditional ideologies of territory began to intensify in the 1960's when the government accelerated the demarcation process in its commitment to convert 40 percent of national land into 'reserved forests' areas (Vandergeest and Peluso 1995). The 1964 National Forest Act reduced community input in the 'reserved forest' demarcation process which was streamlined to make it more efficient. However, many factors undermined this process. Logging operations, increasing population and conflicting mandates within other state departments (for example attempts to make semi-nomadic swidden cultivators stationary in settlements within demarcated forests) meant that by 1985, when 42 percent of the nation had successfully been demarcated and mapped as 'reserved forests' less than half of the territorialized area could be identified as a biological forest (ibid). The RFD had also enclosed many existing occupants within its map of 'reserved forests'.

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During this time millions of people living within this reterritorialized land were prohibited by the state from using it and they were without formal state occupancy rights until the early 1980s. The RFD had claimed sole ownership and a monopoly on authority to allocate land rights within this territory (ibid).

To address these growing concerns as well as concerns over the rapid loss of forested areas, the state began to shift towards strategies of natural resources territorialization that used scientific knowledge as the basis for encouraging or prohibiting certain activities within a territory (Vandergeest and Peluso 1995). The first examples of this type of territorialization took place when the concepts of national parks and wildlife preserves were introduced into legislation in 1960 and 1961. These were slow to be implemented at first; however, by 1991, 11 percent of the nation had been demarcated as one of these two categories (Vandergeest 1996). In the 1980s a watershed classification system was also introduced as the RFD undertook the mapping of more and more detailed classifications of land to justify the implementation of new rules dictating what practices were and were not allowed in certain areas (ibid).

In the 1990s the Forestry Sector Plan created a new 'protected area system'. which included reclassified national parks, class I (erosion-prone) watershed areas and wildlife sanctuaries (Vandergeest 1996). Access became strictly regulated within this classification. Ganjanapan (1998: 77) believed that "the development direction fostered by the government has increased the deterioration of natural forests" and that the Thai state's increasing claims to ownership and authority over natural resource management was related to seeing the environment primarily for its economic uses (Ganjanapan 2003).

"As late as the 1950s probably over half of Thai national territory was still under forest cover; today, the figure is between 10 and 20%. This is despite the demarcation of almost half of Thai territory as forest since the early 1960s" (Vandergeest 1996: 161).

In 1989, major flooding in the south and in Bangkok led to a ban on logging and the intensification of state enforcement in watershed management. The military and police assisted the RFD in trying to remove people from national parks and areas inappropriate for agriculture which was met with resistance (Vandergeest 1996). At the same time, the RFD began to allow non-transferable cultivation rights in areas classified as 'reserved forests'. These "STK" certificates required adherence to a list of regulations that did not allow for swidden cultivation and were limited to a five-year period. Soon after, Sor Por Kor land rights were introduced and by the end of 1994, 21 million rai had been allotted Sor Por Kor land rights. This large allocation of portions of reserved forest land took place amidst much controversy. (ibid).

Vandergeest and Peluso (1995) described the territorial dimension of state-social interactions and the way the Thai state has progressively intensified its territorialization of natural resources and people, particularly in the rural areas of Thailand. Vandergeest (1996) outlined in more detail the three stages of internal state territorialization in Thailand's forests up through the early 1990's that have been described here. To summarize, the first involved declaring all unoccupied lands as forests under the jurisdiction of the state's RFD. The second stage involved classifying forests as 'reserved' or 'protected', mapping them and prohibiting certain activities within their borders. This strategy intensified in the final stage when areas were remapped by scientific criteria by which more detailed prescriptions for allowable and prohibited activities were developed.

Many people do not recognize the authority of the state over their land or

agree with the assumption that clearly bounded private property enforced by the state is superior to "local property right and claims [that] continue to compromise complex bundles of overlapping, hierarchical rights and claims" (Vandergeest and Peluso 1995: 285) In 1995, only fifteen percent of land in Thailand was deemed private property legally by the state (ibid) and some farmers could not ask for these rights without losing traditional rights and benefits (Ganjanapan 1994). The government was accused of allocating forest land to the rich while simultaneously removing poor farmers from national parks (Ganjanapan 1998). Environmental protection has been used as a means erasing people's rights and removing them from conservation areas (ibid).

In resistance to perceived injustices by the RFD in northern Thailand in the 1980s and 1990s a community forest movement began advocating for communities to have authority to manage forest areas (Wittayapak and Baird 2018). "Forest conservation requires more than just legal protection: it involves complicated watershed management with the full participation of all those involved, especially the forest settlers" (Ganjanapan 1998: 73). The community forest movement brought academic activists, local communities and non-governmental organizations together with government actors to discuss property rights for common property resources (Wittayapak and Baird 2018). Despite promising momentum in 2010, the goals of community forest legislation were never fully realized and the community forestry movement lost steam. This movement later evolved and expanded to include human rights and citizen rights but at its inception the community forest movement was focused on gaining right for people to access resources they needed for their livelihoods (ibid). The government continued to see forests as state property while local people and academic activists continued to see forests as both state and communal property (Ganjanapan 1998).

It is this already complex and contested territorial landscape that non-state actors such as industry, international non-governmental organizations, foreign governments and aid donors have increasingly been influencing the territorial process (Corson 2011). There has been an emerging trend "of domestic and transnational private governance systems that derive their policy-making authority not from the state, but from the manipulation of global markets and attention to consumer preferences" (Cashore 2002: 504). It is becoming more common for global parks, carbon offsetting programs, eco-certifications and PES projects to play a part in restructuring existing governmental regulations. In the past "increased global involvement in national-level environmental protection has facilitated internal territorialization in Thailand" (Vandergeest and Peluso 1995: 286).

In this review, I've attempted to outline the history of progressively intensifying territorial strategies of spatial control that the Thai state has implemented on land that it has classified as forest and how these strategies have often been incongruent with the multiplicity of local territorial strategies that coexist in rural northern Thailand (see page 5). This intersection of forest rights and authority continues to be dynamically contested. It is in this context that international organizations that hope to promote carbon sequestration through market-based PES projects are interacting.

The case study of AURA PES is nested within a web of local, national and international environmental understandings and territorial claims. The ways in which AURA PES interacted with, and potentially altered, this web of territoriality will thus be investigated in this research, as will the ways that non-state actors navigate in this complex territorial landscape. Agrawal (2005) proposed that politics, institutions and identities were interrelated parts that needed to be looked at simultaneously and historically in order to get a more holistic picture of transformations in environmental

governance and environmental subjectivity. His concept of 'environmentality' is a useful lens to look the contested landscape of forest management and ownership in northern Thailand and is the subject of the following section.

## 2) Environmentality

Agrawal (2005) introduced the concept of *environmentality* in his book "Environmentalities – Technologies of Government and the Making of Subjects." He relayed a story about a man he met in Kumaon, India, whose attitudes, beliefs and actions in relationship to forests had made an almost complete reversal over the eight years between their conversations. Agrawal became interested in "explaining the why, when, how, and in what measure people come to develop an environmentally oriented subject position" (2005: 2). He coined the term *environmentality* which "refers to the knowledges, politics, institutions, and subjectivities that come to be linked together with the emergence of the environment as a domain that requires regulation and protection" (Agrawal 2005: 226). Shifts in any of these components create new forms of environmentality.

> "To improve populations requires the exercise of what Foucault identified as a distinct, governmental rationality – a way of thinking about government as the 'right manner of disposing of things" (Li 2007: 6). "Governmental discourses methodically mobilize particular assumptions, codes, and procedures in enforcing specific understandings about the economy and society. As a result, they generate "truths" or "knowledges" that also constitute forms of power with significant reserves of legitimacy and effectiveness" (Luke 1995: 69).

The foundation for Agrawal's concept of environmentality is built on Foucault's concept of governmentality. While many people associate Foucault with

*power* and *discourse*, much of his focus was on the *subject* or *subjectivity*. For Foucault, a subject becomes a subject only under power of discourse (Foucault 1983). Foucault's concept of "governmentality" refers to the attempt to shape human conduct by calculated means (Li 2007). Instead of employing command and control mechanisms "rather the government operates by educating desires and configuring habits, aspirations and beliefs" (Li 2007: 5).

Agrawal (2005) built on Foucault's *governmentality*, with the concept of *environmentality,* which is a lens to look at the processes and practices through which people come to adopt a certain awareness or ethic towards the environment. This includes the process by which someone determines if their actions towards the environment are positive or negative. "New technologies to govern forests are also linked to the constitution of *environmental subjects* – people who have come to think and act in new ways in relation to the environmental domain being governed, forests" (Agrawal 2005: 7). He argues that people became 'ecological subjects' after being exposed to and accepting new knowledge, ideas or practices towards the environment. The introduction of new language and new ways of thinking about the potential uses of the environment can result in new ways to imagine environmental governance, or more specifically, forest governance (ibid).

> "In general, technologies of government may be characterized as
> being founded on some combination of knowledges, regulations based
> upon these knowledges, and practices that regulations seek to govern"
> (Agrawal 2005: 220).

In his exploration of the process in which environmental subjects are made, Agrawal (2005: 164) asked, "when and for what reason do socially situated actors come to care for, act, and think of their actions in relation to something they define

as the environment?" His research argued that there is "a significant link between changes in regulation, practice, and subjectivities" (Agrawal 2005: 18). He proposed that politics, institutions and identities were interrelated parts of any technology of government and needed to be looked at simultaneously and historically in order to get a more holistic picture of transformations in environmental governance and environmental subjectivity (ibid). He also argued that categories such as gender or wealth were not good indicators for explaining environmental beliefs or outcomes. Instead, the level to which individuals had become environmental subjects was a more informative category to explore when understanding actions and beliefs towards the environment.

Environmental knowledge is important not only because it can be used to change people's understanding about the environment but also because it can be used to change their actions towards the environment. Changing knowledge can be more efficient than regulations and economic incentives in influencing people's habits and actions. If you convince people certain actions are in their own best interest then laws, enforcement, or payment plans are less necessary.

Environmentality is a form of environmental governance that, supported by territorialization, convinces people that they need another form of governance. The goal of producing and promoting particular knowledge is to convince subjects that it is within their best interest to conduct themselves in accordance with conservation plans. "For the transnational development apparatus (donors, development banks, consultants, and non-governmental agencies), acquiescence is crucial. Lacking access to the means of violence, they can operate only by educating the desires and reforming the practices of their target populations" (Li 2007: 16).

Market-based forest management techniques have the ability to change social practices and norms. To shape the conduct of subjects, market-oriented conservation programs must produce new knowledge to rationalize this conduct. They encourage a certain environmental ethic or 'environmentality' by promoting specific understandings of conservation ethics that in time convinces people that acting in a particular way is for their own good. Environmentality "can be inspired by many sources – agencies of the state, certainly, but also amorphous regulatory norms and institutions that affect the very thoughts and experiences of persons; authoritative figures, as within a community or family; or, as importantly, one's own self" (Agrawal 2005: 7). In the case of AURA PES, LEAF staff working in Thailand (LEAF Thailand) spent many months researching local understandings and promoting their brand of environmental awareness in the Mae Sa watershed. Their work was motivated by the crisis of global climate change and the emerging knowledge of how forests can help mitigate this process.

Local, national and global actors all have their own view and knowledge of what the optimal state of the environment is, and what policies and behaviors should be practiced to reach their goals. The interaction of local residents, business, state sub-district and environmental authorities, non-state experts and third-party intermediaries that came together to negotiate AURA PES was a new nexus of environmental decision making, or what Agrawal might call a new '*governmentalized locality'* (2005: 6). Each of these actors brought to the table their own knowledge and practices. They were able to find a vision of joint interest while in pursuit of their own individual goals. PES, as a new technology of environmental governance, changed how AURA PES participants envisioned who could be involved in local forest management and how they could be involved, creating a whole new set of agreements, expectations, financing, and practices.

Agrawal (2005) asked how does success in conservation reforms hinge on processes of environmental subject making. If we are interested in the knowledge produced by AURA PES it is useful to look at the diverse actors involved and to understand how local people have historically created their own discourse of environmental awareness and management practices (Li 2007). Chapter 3 will look at changes in knowledge and practices that took place in Pong Khrai village before the introduction of the project. To what extent these new practices have they been adopted and gained legitimacy among the various stakeholders as a result of exposure to the project will be examined in Chapter 5.

**3) Payment for Ecosystem Services (PES)**

The word *forest* and the ecosystem services which are associated with it are very subjective. People and state institutions define forests and the value of the ecosystem services they provide in diverse ways which depend on personal inclinations. Wittayapak explained during a class (Nov 26, 2015) that for some northern Thai, in the past the word forest signified *uncivilized, barbarian* or *unThai.* They were the edge of civilization. In past Thai cosmology, there were two kind of spirits: guardian spirits that protect the city and houses and guardian spirits that live in the forest and do harm. The forest was a place you didn't want to go. In more recently Buddhist 'naamaak' teachings the word for *forest* has been associated with the word for dharma and to be aligned with nature is considered to be aligned with the dharma.

The forests of northern Thailand are predominantly mix deciduous and dry dipterocarp forests, with evergreen forests above 1,000 meters. They can be dense and diverse and were historically inhabited by such animals as elephants, monkeys, birds, wild boars and wild cats. Recently, the rapidly expanding human population has destroyed much of the region's wildlife habitat, resulting in greatly reduced animal populations.

For many in northern Thailand, diverse methods slash and burn or swidden practices were historically a common way to envision land use. In the past, ecosystem system foraging practices were also common to collect building materials, household objects, fuel and nutritional sustenance. Other people plant what I previously considered to be tree plantations such as tea or coffee within what I previously considered to be canopy forests. It is also a common practice for northern Thai people to protect forests at the headwaters of their watershed to protect their water supply. Forests in this region have historically been harvested to fire brick kilns, to make railroad lines and homes and for export.

Ecosystem services, sometimes referred to as environmental services, are defined as "the materials and processes that ecosystems produce that are of value to people" (National Fish, Wildlife and Plant Climate Adaptation Partnership 2012: 12). While some ecosystem services, such as revenue for the fishing industry can be monetized in a relatively straightforward manner based on wild, free-ranging marine species, other ecosystem services such as physiological comfort or cultural identify associated with wild species and habitats are much more difficult to assign an accurate economic value to (ibid). In the global discourse on climate change it is believed that forests play a role in climate change mitigation because of the ecosystem service they provide by sequestering carbon. "Terrestrial carbon sequestration is the process by which atmospheric $CO_2$ is taken up by trees, grasses, and other plants through photosynthesis and stored as carbon in biomass (trunks, branches, foliage, and roots) and soils (National Fish, Wildlife and Plant Climate Adaptation Partnership 2014: 31). Other ecosystem services associated with forests include oxygen production, carbon sequestration, flood and erosion protection, water filtration, aesthetic enjoyment and biodiversity habitat maintenance.

"By questioning the old truth regime of mere economic growth, a new

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regime of truth for attaining sophisticated ecological economy stands ready to reintegrate human production and consumption in our biological systems" (Luke 1995: 73).

It is problematic that economies are able to grow without acknowledging the ways in which they deplete the ecosystem of the global biosphere. The PES concept is a market-based solution to this problem. When forest ecosystems are taken apart, processed and sold in pieces the total value of the services they provide is not recovered. For example, when a forest is harvested the economic value is given to the fire fuel, paper pulp, lumber and other forest products but little or no value is economically associated with the ecosystem services that contribute to the well-being of our shared global biosphere.

> "In the regulation of carbon emissions, some countries see themselves as guardians of the global environment… Others portray themselves as needing to pursue higher levels of development and demand compensation in the form of transfers of funds and new technology. They argue that such transfers of wealth and technology are necessary in part because they have been the victims of centuries of high levels of production of greenhouse gases in the North. It is in such tensions between regulation and practices that the ground of politics and political knowledge is generated" (Agrawal 2005: 229).

Payment for ecosystem services (PES) is a relatively new environmental economics policy intervention aimed at balancing development goals with natural resource management goals by recognizing the value of ecosystem services, and enlisting either state or private funders to compensate the people who protect and maintain them. Shortfalls in conservation goals and conservation funds, as well as

funding from international initiatives, have led to a willingness to try new methods and to involve new stakeholders. The idea behind PES is that if compensation is given to those who protect the forests at a rate that is equal to or more than the profit they would have made by clearing them, then they will be motivated to conserve or restore the forests (Engel et al. 2008). For example, previously if a forested area was cleared, monetary profit may be gained from selling the wood and producing agricultural products on the newly cleared land; however, the value of the carbon storage, water purification and habitat maintenance that was provided for the global community was not accounted for. The logic of PES is then that these services should be commoditized and incorporated into market type exchanges.

"The goal of PES programs is to make privately unprofitable but socially desirable practices become profitable to individual land users, thus leading them to adopt [these practices]" (Engel et al. 2008: 670). PES projects are intended to make "non-market values of the environment into real financial incentives for local actors to provide environmental services" (Engel et al. 2008: 664). They are designed to make conservation or restoration more financially worthwhile than natural resource degradation (The and Ngoc 2008).

A definition of PES that is commonly cited (Engel et al. 2008, McElwee 2012, To et al. 2012, Neef and Thomas 2009) is as follows: "a *voluntary* transaction where a well-defined environmental service (or a land use likely to secure that service) is being 'bought' by a (minimum one) *service buyer* from a (minimum one) *service provider* if and only if the service provider secures service provision (*conditionality)*" Wunder's (2005: 50, emphasis in original). In this definition, PES programs must have a buyer, a seller (service provider) and involve a specific service provided (Neef and Thomas 2009). The service provider might be individual landowners, communities with joint management rights or even governments as owners of public

lands (Engel et al. 2008).

It is important that a clearly definable and measurable ecosystem service is identified and the amount of payment and the conditions necessary for payment must be agreed upon. The desired effects or 'outputs' such as water purification or carbon storage can be difficult to measure so instead 'inputs' such as hours of work, trees planted or hectares conserved are more often used as a measurable metric of payment (Engel et al. 2008). Once buyers, sellers and ecosystem services have been identified, trust must exist or be built between the parties (Neef and Thomas 2009).

The design of a PES program is also considered to have a large influence on the level of the project's success (Engel et al. 2008). Community participation in the development of the concept, infrastructure and management of PES projects has been cited as an important component of successful PES projects and has been shown to be possible even when there are highly technical aspects to valuing ecosystem services (Rawlins and Westby 2013). An institutional setting of credible intermediaries, supportive legal and regulatory frameworks, and well-functioning property rights are required in order for PES programs to function well (ibid). In Thailand, there is not currently a supportive legal framework for either communal or individual rights to forest resource management particularly in land recognized as official conservation zones (Neef and Thomas 2009).

Cashore et al. (2007) outlines some of the key features of non-state market-driven forest resource governance that differ from state regulations. The features that are most applicable here are that there is limited threat of fines or incarcerations for non-compliance and that profit-making firms may take on additional costs that they would not otherwise pursue. These forms of voluntary governance, or self-regulation, have few or no mandatory rules in regards to behavioral changes (ibid). The balance

required with these types of conservation mechanisms is that they must be aggressive enough to decrease environmental degradation, but at the same time cannot be so costly as to put the participants at a competitive disadvantage in the marketplace (ibid). Therefore, it is likely that actors who already employ less destructive practices are more likely to voluntarily participate than the actors who employ more destructive practices due to the higher costs associated with changing their practices.

PES projects may offer a new ideology of what good behavior is or new possibilities of economic rewards to those who behave in a way that is deemed as good. Instead of punishing practices deemed destructive, land users are presented with new avenues of funding that allow them to be more successful in environmental restoration efforts that may have been unsuccessful previously. In theory, the supply side of PES programs shifts focus away from negative externalities to positive externalities; however, the consequences of this shift are not straightforward (Hecken and Bastiaensen 2010). There is a risk that providing payments for practices that would otherwise be expected from a responsible land user could contribute to diminishing existing social norms of responsible land use management (ibid). This is exacerbated by the fact that from an efficiency point of view, the most effective PES programs would target the worst offenders (ibid). The concern then is that PES programs will erode social obligations of land use management, while those who currently employ the most degrading practices will be rewarded (ibid).

The PES approach has other complexities. There is a limited ability to measure whether or not PES projects actually meet their stated objectives and provide improvements to what would have occurred in their absence. There are also concerns that PES programs may simply shift environmental degradation to other locations, or that benefits may not be sustained if the program financing ends (Engel et al. 2008). "Despite some important limitations, PES and related schemes are an important

addition to the set of policy options and instruments to integrate conservation and development" (Lebel and Daniel 2009: 65) as negotiated by state and non-state actors but it is recommended that the PES approach not be used alone but rather in coordination with other policies (Hecken and Bastiaensen 2010).

## 1.5.2 Review of Related Studies

Payments for ecosystem services programs were a relatively new policy instrument at the time of this research, with the first pilot projects in Thailand being developed and implemented at the time of this study. Thus, studies of working PES projects in Thailand did not yet exist. Vietnam is considered one of the pioneering countries in the region immediate to Thailand to have implemented PES programs (The and Ngoc 2008) and was the first country in Southeast Asia with a national law promoting PES (McElwee 2012), along with Mexico, Costa Rica and Ecuador in other parts of the world (Wunder et al. 2008). Thus, more literature is available on Vietnam than on other countries in the Southeast Asia region. All land in Vietnam is state-owned but may be allocated for long-term use (The and Ngoc 2008) and due to the socialist market context, the results of these programs may not apply to other countries with differing property rights regimes.

Vietnam has been motivated to reforest as the demand for construction materials has increased and the price of certain woods has risen (The and Ngoc 2008). A study of several short-term pilot PES programs in forest management in Vietnam showed promising results in regards to the reduction of soil erosion and destructive extractive activities (The and Ngoc 2008). The state is responsible for designing, monitoring and often the financing of PES programs (The and Ngoc 2008) and it has been argued that the state maintains its level of power in the regulation of forests. In many ways, Vietnam's PES programs may simply replicate already existing patterns of institutionalized management" (McElwee 2012: 413).

While the main objective of PES is environmental protection or conservation, many published articles focus on their impact on livelihoods (Turpie et al. 2005, Engel et al. 2008, Neef and Thomas 2009, To et al. 2012, McElwee 2012, Bremer et al. 2013). In fact, one of the reasons that PES programs have been promoted in Vietnam is because it is believed they will decrease poverty by improving livelihoods, while at the same time increasing local participation in forest conservation (The and Ngoc 2008). PES programs are specific to each place and reviews of their overall impacts on livelihoods are mixed. A study in Vietnam showed how insecure land tenure and high transaction costs can undermine the long-term benefits of PES programs for local households and contribute to existing inequalities (To et al. 2012). Another study looking at the effects of a national-scale PES program focused on grasslands in the Ecuadorian Andes showed that well-organized participants on collective land have experienced livelihood benefits; however, small and medium-sized landowners have had livelihoods hindered by the program (Bremer et al. 2013).

Other PES programs are designed intentionally as social welfare programs. For example, a successful government-funded PES program removing invasive plants in South Africa. In this program, previously unemployed individuals are specifically hired to perform ecosystem services, rather than landowners (Turpie et al. 2005). It remains controversial whether PES programs should be viewed as a policy tool for poverty alleviation at all (Neef and Thomas 2009, To et al. 2012, McElwee 2012) and whether many of these programs should be considered true PES programs, is questionable because they are not really voluntary (McElwee 2012: 413).

There are many kinds of PES programs and an important distinction is made between programs that are financed by governments and those that are financed by the actual users of the ecosystem services (Engel et al. 2008). The AURA PES project

is not a government financed project. It is an example of a user-financed program in which Aura Company financed the project and directly benefited from the ecosystem services it hoped would be enhanced through their investment. These programs are more likely to be effective because the company is directly involved in the watershed area and they have a clear incentive to assure that the program is working, plus they are able to directly observe the results (ibid). Conversely, programs financed by governments or international institutions may be less effective for the opposite reasons. They may not know the value of the services, may not be able to observe if they are being provided and have less incentive to make sure the program is working (ibid). These large-scale programs however, may be more cost-effective.

PES market-based mechanisms can be attractive for a number of reasons. PES mechanisms intend to reward 'good' behavior instead of punishing 'bad' behavior. PES programs have also demonstrated the ability to enhance ecosystem services. For example, a study between 2006-2011 at ten water stations in China showed improved water quality as a result of a watershed PES program (Lu and He 2014). A study of several short-term pilot PES programs in forest management in Vietnam also showed promising results with regards to the reduction of soil erosion and destructive extractive activities (The and Ngoc 2008).

PES mechanisms, however, are not the best option in all cases. In some cases, a lack of information or beneficial technology may be the cause of environmental destruction. In this case, awareness building or access to credit may be more appropriate interventions (Engel et al. 2008). PES programs work best under very specific conditions, and in all cases, the level of payment must exceed the profit that would be made through alternative uses (ibid).

In the United States, drinking water, wastewater, and electric utilities are increasingly using payment for watershed services programs (Bennett et al. 2013). A challenge identified by a study of 37 payment for watershed services in the United States was the difficulty of making a business case for these programs (Bennett et al. 2013). The study identified six different funding mechanisms, and in all six it was noted that nonprofit organizations were critical as intermediaries (Bennett et al. 2013). One reason nonprofits might be so crucial for the success of PES projects is that they are local enough to be able to disseminate specific environmental knowledge that promotes specific environmental actions.

## 1.6 Conceptual Framework

In the international goal to reduce carbon emissions through innovative watershed forest management, diverse actors were brought together to collaborate on the reforestation of a designated area of land. Agrawal's (2005) concept of environmentality proposed that politics, institutions and identities were interrelated parts that needed to be looked at simultaneously and historically in order to get a more holistic picture of transformations in environmental governance and environmental subjectivity. This research will attempt to use the theoretical guidance of Agrawal's environmentality to explore progressive changes in spatial power in terms of territoriality both before and after the implementation of the PES pilot project. The historic interactions of local knowledge and practices with state institutions in the Mae Sa watershed is examined to develop a more complete understanding of the local dynamics of land management that existed before AURA PES was introduced.

Even at a small scale, PES projects require renegotiation of territoriality in order for land to be set aside for the operation of the project. The progressively intensifying territorial strategies of the Thai state have historically been contested, particularly in rural northern Thailand, which can make the implementation of market-based mechanisms like PES more challenging and unpredictable. AURA PES is intended to influence participants practices

towards the environment and interacts with both state and local ideologies of forest management, authority and ownership. Thus, the concept of environmentality continues to be useful when investigating new expertise or practices that resulted from participation in AURA PES and the stakeholders there were involved in the operational process by encouraging that PES projects be examined in their historic context.
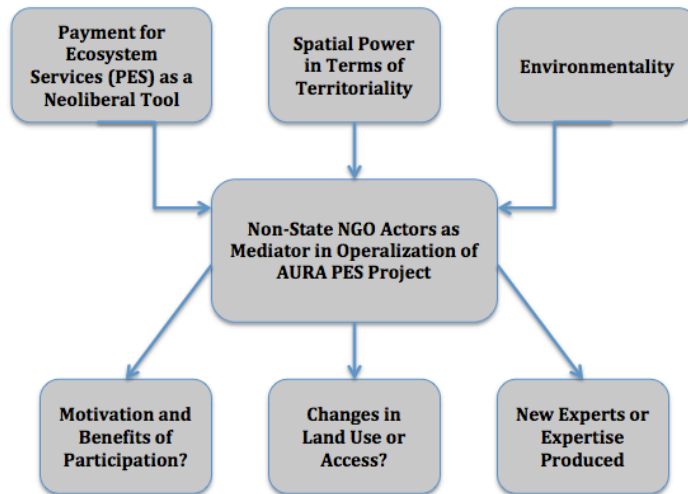


Figure 1.2: Diagram Conceptual Framework

## 1.7 Research methodology

The author was introduced to LEAF Thailand through their counterpart in the Thai government, the DNP, in April 2015, a few months prior to the kick-off of the two-year AURA PES pilot project in June of 2015. At that time, LEAF Thailand was in the process of selecting and preparing a planting site and organizing trainings on reforestation techniques, planning and budgeting for AURA PES participants. LEAF Thailand's role in AURA PES ended in December of 2015 when funding for the USAID LEAF project ended and there was no additional funding available for LEAF to remain engaged. This research continued to follow AURA PES for the entirety of its two-year implementation phase which ended in June 2017. This also included the first year of AURA PES2, the second stage of implementation that took place after the LEAF Thailand project had already ended.

### 1.7.1 Research site

The AURA PES pilot project in the Mae Sa watershed was ideal for investigating the development and working mechanisms of an active PES pilot project in northern Thailand. The Mae Sa watershed is located in a mountainous area in northern Thailand in the Mae Rim district, north and west of Chiang Mai city and has been the site of many pilot projects in the past. Within the Mae Sa watershed there are twenty subwatersheds totaling an area of 86,737 rais (13,880 hectares) (Wongsa 2015a). The Mae Sa watershed is part of the Ping River Basin, which is the largest of the eight river systems that make up the Chao Phraya river system. The research site is located inside UNESCO Mae Sa–Kog Ma Man and Biosphere Reserve, but outside of any National Park. Figure 1.3 below situates Chiang Mai Province within Thailand. Figure 1.4 situates the Mae Sa watershed within Chiang Mai Province.



Figure 1.3 Chiang Mai Province       Figure 1.4 Mae Sa watershed
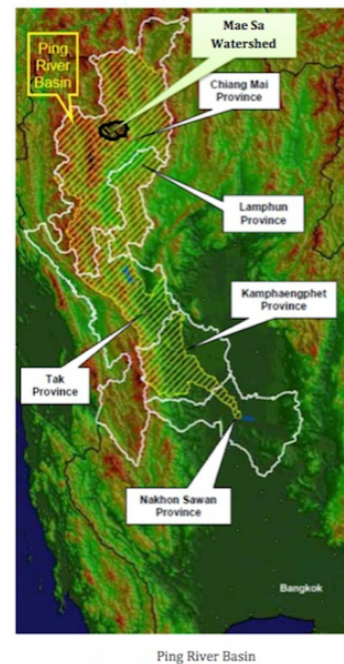
Figure 1.5 shows the general area of the AURA PES planting site and where the stakeholders, Aura Company and Pong Khrai village, are situated in relation to the city of Chiang Mai where the LEAF Thailand office is located.



Figure 1.5 – Location of AURA PES stakeholders in relation to Chiang Mai city.
(Source: www. maps.google.com)

### 1.7.2 Unit of Analysis

Payment for ecosystem services programs can be viewed on multiple levels: local, regional and global, and programs should be addressed at corresponding levels (Hecken and Bastiaensen 2010). Motivation and funding for this project was initiated at the global or international level, with funding and direction coming from USAID, through a grant allocated to Winrock International. This research investigates how particular global environmental knowledge and associated policies were produced and promoted at the local level and what influence or lack of influence they had on changing people's beliefs and practices in relation to watershed forests. The AURA PES pilot project will be placed in the context of multiple territorial layers including local residents, local *tambon* districts, parks designations, regional non-governmental initiatives and national governments to analyze any impacts the local territorial context had on the development of the project and any ways that the project may have altered existing territorial dynamics.

### 1.7.3 Data Collection Methods

The researcher organized interviews, site visits, participation in a LEAF facilitated training activity and presentations given at an AURA PES related event. Data was collected through semi-formal, in-depth and life history interviews and casual conversations with a diverse sample of individuals representing the various stakeholders in AURA PES within the limits of time permitted. Additional data was collected through the review and analysis of project documents and government reports.

Interviews followed research ethics by providing detailed information about the research project, its aims and objectives, and the author's role as a Masters student of Chiang Mai University, to all participants. Time was also allotted for informants to ask their own questions. Every informant was given the researcher's contact information should they have interest in contacting the researcher in the future.

Most informants were selected based on their direct involvement in AURA PES. Interviews were carried out both in English and in Thai with the assistance of a translator, depending on the informant. When in-person interviews were not possible, interviews were conducted over the phone. The author was fortunate to retain the translating services of a Chiang Mai native who is familiar with field research in general and the topics of this research specifically. We agreed that interviews in Pong Khrai would not be translated word for word. Instead, research goals and questions were prepared and reviewed prior to interviews. During an interview, the translator asked a question in Thai and paraphrased the responses in English. Together it was agreed how to direct the subsequent questions. All interviews were recorded, transcribed and referenced at a later date to obtain more detail from the informants' exact responses if necessary.

### 1.7.4 Interviews, Participant Observation and Textual Analysis

This research included interviews with participants as well as a few non-participants of AURA PES in the Mae Sa watershed (see Appendix A for informant list). Just over half of the total informants were residents of Pong Khrai village. These 11 interviews included (in overlapping categories): four AURA PES Committee Members, three additional AURA PES participants, four non-participants, two children and two teenagers. Two elders/long-term residents were also interviewed to gather in-depth life history information that explored the local history of attitudes and practices in regards to the land surrounding the village.

Additional informants included representatives from Aura Company, staff at LEAF Thailand and Winrock International and local forest restoration experts at the Forest Research Restoration Unit (FORRU) at Chiang Mai University. Of the informants, six were females and fourteen were males. This imbalance is noted and was similar to the gender imbalance that existed in the composition of AURA PES stakeholders.

The author complemented information gathered by informant interviews with participant observation of practices at the case study site and interactions with collaborating officials. This included LEAF Thailand facilitated training visits to the AURA PES planting site with international visitors and presentations given at the Aura Company plant. Participant observation was used to analyze how participating stakeholders perceive AURA PES and each other, and to examine the in the field reality of the practices involved in the implementation, monitoring, and evaluation of AURA PES.

In addition to interviews and participant observations, the author gathered and analyzed documentation about AURA PES including documents produced by LEAF

Thailand, the Forest Research Restoration Unit (FORRU) and Winrock International. Reports produced by the Thai government and the United States government during the time frame leading up to and during the implementation of AURA PES was also reviewed.

### 1.7.5 Researchers Perspective

Growing up in the suburbs of Washington D.C., my family had a clear land title to our house and the surrounding land. In my experience of territoriality, my family did not need to ask permission to plant or harvest the flowers and fruits we grew on this land and we were free to plant or cut trees as we saw fit. Even though the plot of forest land directly across the street was unoccupied and unused, I never entered it to collect wood or other forest products or saw anyone else do so. I've also never felt concerned that due to the number of trees on our land the government would reclassify our land as a national park or a reserved forest, and in turn reclassify my family as illegal squatters.

The only experience I had of anything resembling communal property was a community garden where my family grew vegetables. However, this land clearly belonged to the county authority where we lived and an application process was required in order to be assigned a plot of land for cultivation. If someone decided to pick vegetables from this land or fruits from our private property it was considered trespassing and it was clear which authority could be notified in order to intervene. While much of the state of Virginia where I grew up is known for agricultural activities, particularly tobacco, in my suburban youth I did not know a single person that relied on land for sustenance or accessed water without paying for it. For urban dwelling readers with limited experience of communal land management or contested state territoriality the historic dynamics of land use for people living in rural northern Thailand may be challenging to visualize.

I have worked many summers in the Tongass National Forest in Southeast Alaska, United States, including five months during the course of this research. This temperate rain forest is managed by the US Forest Service is the United States' largest national forest which is dominated by three tree species, western red cedar, western hemlock and sitka spruce. Unlike northern Thailand where wildfire and water supply are a primary concern, trees in this region are blanketed in rain or snow much of the year are more likely to succumb to windfall, avalanches or disease than fire. This region of the United States is not densely inhabited by people and the landscape is marked by glacial retreat. The Tongass National Forest is habitat for creatures rarely seen in the lower 48 states including brown and black bears, wolves, moose, mountain goats, and bald-eagles. When I step into the Tongass National Forest I always carry bear mace as a precaution and have a clear sense that as a human I am a visitor here. When I have witness the sides of mountains shaved clear of trees I know that humans have gained economically from the timber that was processed but my heart also feels for the glorious creatures that have lost their homes.

It was not until I began studying at Chiang Mai University in northern Thailand that I was confronted with my belief that intact ecosystems and human dominated ecosystems were separate spaces with little space for a middle ground in between. In fact, I had never questioned the validity or necessity of national forest or areas that were protected from human influence. The human ecosystem interactions in northern Thailand have required me to examine and reframe these assumptions.

## 1.8 Organization of Thesis

This study is organized into five chapters. Chapter 1 provides an overview of the thesis starting with the positioning of the US and Thai governments within the global climate change discourse at the time when they both influenced the implementation of a PES pilot project. This is followed by a brief introduction to the diverse practices of land management

and territorial negotiation that people in rural northern Thailand have tried to maintain and enforce as they have increasingly interfaced with both state and market ideologies. The sociological problem of effective watershed forest conservation is coupled with a theoretical inquiry into how global market-based conservation projects are adapted to and influences the complex and contested landscape of forest authority in northern Thailand. The literature review of three concepts; spatial power in terms of territoriality, environmentality and payment for ecosystem services includes an overview of related studies. Finally, the conceptual framework that guided the research is laid out along with details of the research methodology.

At the time that AURA PES was being developed (2012-1015), no working PES projects existed in Thailand. Chapter 2 provides an overview of the stakeholders involved in AURA PES. It details how they were engaged and how they hope to benefit from participating. An overview of LEAF is provided including the goals and scope of their work in the region. The collaboration of DNP with LEAF in Thailand are then discussed. The activities that were necessary before the negotiation of a PES pilot project, the pre-implementation phase, are described followed by an overview how the buyer/beneficiary and service provided were engage and chosen. Finally, the role of local forestry experts and the local subdistrict authority are presented.

Chapter 3 starts with a description of the Mae Sa watershed context in relation to Chiang Mai city. It offers a historical geography of the AURA PES sole service provider, Pong Khrai village. Stories of past practices of land use and land ownership from elders and other residents illustrate how Pong Khrai resident's beliefs and practices towards forests have shifted over time. This is interwoven with corresponding ecological, institutional and social events to examine the evolution of Pong Khrai's environmentality towards forest use, ownership and management. It discusses the complex history of territorial claims on the land that was designated for the AURA PES forest restoration site.

Chapter 4 begins with an overview of the operational process and practices of AURA PES. This includes the project budget, the timeline of activities, the mechanism for payments and the roles and responsibilities of the AURA PES Committee. It discusses how the AURA PES planting site was chosen, approved and demarcated and identifies which stakeholders were deemed necessary and gave their approval for the site to be used for forest restoration purposes. It then describes the Kick Off Celebration and Planting Day Event and the specifics of the project's restoration activities are examined. This chapter concludes with a summary of the role of FORRU, a local forest restoration expert from Chiang Mai University, in the replication of AURA PES after the LEAF Thailand project had ended.

Chapter 5 discusses the research findings and results beginning with a summary of the operational practices and practices of AURA PES. The investigation of historic beliefs or practices in Pong Khrai village that was presented in chapter 3 will allow the new expertise that have been adopted and gained legitimacy among the various project stakeholders and any new territorial dynamics that emerged from exposure to the project to be identified. The theoretical discussion examines how the concept of PES is adapted in the field. The research comes to a close with policy implications and recommendation for further research.

# CHAPTER 2

# AURA PES Stakeholders – How and Why They Participated

## 2.1 Lowering Emissions in Asia's Forests (LEAF) by Winrock International

"Just as no country is immune from the impacts of climate change, no country can meet this challenge alone. That is why it is imperative for the United States to couple action at home with leadership internationally"

(The White House, USA 2013)

The Obama Administration of the United States engaged collaboratively with concerning predictions of climate change and tried to situate itself as an international leader in addressing the challenges it poses. During this time, the United States' global efforts to reduce the impacts of climate change included global agreements and partnerships with countries such as China, India, Indonesia and Brazil (Executive Office of the President 2013). It was a goal of this administration to reduce global land-use-related emissions in other countries, while also conserving biodiversity, protecting watersheds, and improving livelihoods (Executive Office of the President 2013). Under this administration, USAID was allocated funds for climate change related programs abroad. USAID was able to incorporate this environmentality into its mission to end extreme poverty.

"Threatening to make these problems worse is global climate change, driven by fossil fuel use and deforestation. We know a changing climate will hurt the poor most, undermining the livelihoods of millions of people struggling to break free from poverty" (United States Agency of International Development 2016b).

USAID put out a call for proposals under a program originally called the Asia Regional Sustainable Landscape Program. This program would later be renamed Lowering Emissions in Asia's Forests (LEAF). In January 2011, USAID awarded a collaborative consortium between Winrock International, Climate Focus and the Netherlands Development Organization (SNV) with a five-year, $20 million Cooperative Agreement to implement the LEAF program. In this way, funds from the United States government were transferred to a non-governmental organization operating in countries outside of United States territory. Thailand stopped receiving USAID assistance in 1995, as it is now considered an upper middle-income country (United States Agency of International Development 2016d); however, USAID was the sole donor for the LEAF Initiative that conducted work in Thailand. The USAID grant that supported the Winrock International led consortium's implementation of the LEAF project came from 'sustainable landscape funds' which were required to be used for activities that directly reduce emissions.

"Worldwide, forest destruction generates more greenhouse gas emissions each year than do all the trains, planes and cars on the planet. …and forests in Southeast Asia are being cleared faster than almost anywhere on earth" (USAID Climate Change Team 2014).

LEAF was launched in 2011 as a five-year project. Its primary goal was strengthening the capacity of participants in six countries (Thailand, Laos, Cambodia, Vietnam, Malaysia and Papua New Guinea) to achieve and sustain reductions in greenhouse gases through forest management. LEAF had four objectives in Southeast Asia which included work with policy

and market incentives for greenhouse gases, innovation in sustainable land management, and strengthening capacity to improve forest management. Initially, LEAF focused its efforts on technical issues related to REDD+, and most of the six participating countries pursued REDD+ programs. Small offices were opened in all six participating countries shown in Figure 2.1.



Figure 2.1 – Map of the countries LEAF work in
(Source: www.LEAF.org)

Winrock International was considered the prime contractor for the LEAF Initiative, with sub-contracting arrangements with Climate Focus and SNV. In a phone interview with LEAF's Chief of Party (May 18, 2017) he explained that LEAF's regional program is considered fairly unique in the sense that these various subcontractors were not assigned separate tasks or goals. The approach was more integrated so that each of the stakeholders worked together as a team. For example, staff from SNV, Climate Focus and LEAF all shared an office in Bangkok and worked collaboratively. About two years into the project

RECOFTC (The Center for People and Forests) was added as member of the consortium. This organization played a significant role in the advocacy of community forest rights in Thailand (Wittayapak and Baird 2018) but has now expanded their scope to include nearby countries and other natural resource activities. They were very involved with LEAF's work in Thailand (LEAF Thailand), particularly in the Chiang Mai office where they had one permanent staff working together with LEAF Thailand staff. These four, full-time staff were not considered employees of USAID, the United States government, nor the Thai government but rather employees of Winrock International. Once LEAF was established they looked for a counterpart in the Thai government.

While LEAF's Cambodia initiative also showed interest in PES programs, the implementation of the PES mechanism was unique to Thailand within LEAF's regional initiatives. The goal in Thailand was to pilot a small-scale PES project as a 'proof of concept' that would prove that it was possible. If it worked, this would be a starting point to learn from and then expand upon.

## 2.2 LEAF's Collaboration with the Thai Government

"Though Thailand is a signatory to a number of international environmental agreements and despite strong national commitments, Thailand emitted 4.3 tonnes of carbon dioxide into the atmosphere per person per year in 2006. This is roughly 280 million metric tonnes in total, according to the UNDP 2010 Human Development Report" (United Nations Development Programme 2016: 2). The Thai government strives to enhance its role in international environmental agreements and commitments (National Economic and Social Development Board 2016) and is committed to cooperating with the international community (Office of Environmental Policy and Planning 2000).

In addition to environmental concerns, this may also be partly due to the fact that climate-related commitments are associated with international agreements in trade and

investment. It is predicted that in the global climate change context of the future the level of responsibility that individual countries take for greenhouse gas mitigations will be linked to trade barriers in both tariff and non-tariff forms (National Economic and Social Development Board 2016). Despite some positive strides, Thailand does not enjoy the most favorable reputation within the international community. Decreasing total $CO_2$ emissions, with the support of increasing $CO_2$ sequestration from forests, is a step in improving Thailand's reputation as a major $CO_2$ emitter and in reaching its own goals towards being a low carbon society.

Thailand's initial report to the UNFCCC contains a call for the collaboration of local researchers and regional and international experts in the capacity building process. The 11th National Economic and Social Development Plan also encourages that "land management mechanisms should be established and comprised of government and private sectors, academia, the local administration and it populace" (National Economic and Social Development Board 2016: 129). The Thai government actively encouraged NGO participation and estimates that more than 200 NGOs are working with local communities, government agencies, the media and academic institutions in the field of natural resources and the environment to promote sustainable development (Office of Environmental Policy and Planning 2000). Political leaders and local experts are also encouraged to provide communities with information about ecosystems and support community self-reliance in natural resource management (ibid). These practices are very much in line with the development of AURA PES and begin to illustrate how a venture of joint interest was possible between the United States, Thailand, LEAF, and FORRU.

During the implementation of AURA PES, the 11th National Economic and Social Development Plan (2102-2016) outlined the Thai government's overall strategy for development including intentions to restore and conserve the natural resource base with the participation of local communities (National Economic and Social Development Board

2016). It encourages community management of forests' natural resources "such that communities can coexist in harmony with the forests" (ibid: 117) and encourages "increases in natural forest areas outside of conservation areas, by motivating communities to use their common land as community forest areas" and to monitor reforestation efforts to determine addition forest expansion approaches (Nuntapotidech 2009). The government has encouraged local community participation in reforestation activities since 2003 but it is also understood that the expansion of forest areas will not work within local communities if it decreases their ability to earn a living (Office of Environmental Policy and Planning 2000). The 11th Plan sees the empowerment of communities to manage local natural resources properly as a key to transitioning towards successful sustainable resource management and conservation of biodiversity (Nuntapotidech 2009). Planting indigenous species is also encouraged, due to their high adaptability to local climate conditions (Office of Environmental Policy and Planning 2000).

When the LEAF project was created, it focused on Reducing Emissions from Deforestation and Forest Degradation (REDD+) programs. At that time, the DNP was also the focal point of the REDD+ program in Thailand, though other agencies were also involved. After more than a year of preparation and planning LEAF was assigned to the DNP as its counterpart within the Thai government in 2012. They began operating out of the Thai DNP office located in Chiang Mai city in mid-2012, approximately a year and a half after the LEAF project began.

LEAF Thailand and the DNP had common aims to balance ecological and economic factors in hopes of encouraging sustainable forest management as well as enhancing local livelihoods (Wongsa 2015a). The LEAF Chief of Party at Winrock felt that interest in REDD+ was limited in Thailand compared to other countries in the region. However, both LEAF and the DNP were interested in piloting a PES project. The DNP has shown an interest in small-scale programs with hopes of replicating successful results on a larger scale.

At the request of the DNP, LEAF Thailand was to focus its efforts in the United Nations Educational, Scientific and Cultural Organization (UNESCO) Mae Sa-Kog Ma Man and Biosphere Reserve (hereinafter "the MAB Reserve"). This area would ultimately become one of the four landscapes in Asia where LEAF prioritized their efforts and where AURA PES would eventually be negotiated. The DNP requested LEAF Thailand's assistance with the development of a management plan for the MAB Reserve. During this challenging and time-consuming process LEAF Thailand staff also found opportunities to raise awareness about the concept of PES and to identify potential participants for the pilot project.

## 2.3 Pre-Implementation Phase

This section will explore how LEAF Thailand staff used the task of developing a management plan for the MAB Reserve as an opportunity to raise awareness about the concept of PES. It describes the process in which they began to identify ecosystem services and potential participants in a pilot project. This was done while building their own awareness about the important policies influencing payment for ecosystem services in the region.

### 2.3.1 The UNESCO Mae Sa–Kog Ma Man and Biosphere Reserve

The MAB Reserve is located in Chiang Mai Province of northern Thailand, with the total area of about 573 km$^2$. Over half of the MAB Reserve area overlays a large portion of three national parks including Suthep-Pui, Khun Kan and Ob Kan, and four national reserved forests: Doi Suthep, Samoeng, Mae Kan-Mae Wang and Tha Chang-Mae Kanin. Thai and Hmong ethnic groups represent the dominant population in the MAB Reserve (USAID LEAF 2012). "In addition to a rich diversity of flora and fauna, the MAB Reserve is of hydrological importance. It encompasses the watershed of the Sa River, a tributary of Ping River, which has been a major water source for Chiang Mai City" (USAID LEAF 2012: 1). Figure 2.1 shows the location

of the National Parks and the Aura Company Bottling Plant within the MAB Reserve and its location within Thailand.



Figure 2.2 - Mae Sa-Kog Ma MAB Reserve and its location within Thailand
(Source: leafasia.org/infographic-protecting-natural-resources-chiang-mai)

The UNESCO MAB Reserve classification is intended to promote a participatory approach towards ecological stewardship that engages all conservation stakeholders including governmental agencies, the private sector and local communities in hopes of fostering sustainable forms of development where people and nature integrate harmoniously (Wongsa 2015a). Even though the MAB Reserve was designated in 1977, few local communities or government officials were aware that the classification existed, much less its boundaries and guiding principles (ibid). There was a substantial amount of work necessary to build the awareness necessary to develop a meaningful and participatory management philosophy for the area. To

add to the challenge, no funds were available in the DNP budget to facilitate this process (ibid). Under the direction of the DNP, a payment for ecosystem service scheme could not be initiated until an overall management plan for the area had to be developed and approved.

In the process of facilitating a management plan for the MAB Reserve LEAF Thailand consulted many stakeholders. These stakeholders included local communities, members of the DNP, district and provincial authorities and the business community (Wongsa 2015a). The stakeholders were invited to share their concerns and areas of priority so that these could be incorporated into the plan. In June 2013, stakeholders gathered at a participatory workshop to draft a management plan for the MAB Reserve. In March 2014, the DNP in Bangkok approved a management plan that prioritized fire management and water resource management, but also encouraged payment for ecosystem service projects (ibid). As a result, the DNP was given national budget funds to support this work for the first time and is now responsible for the ongoing implementation and monitoring of the MAB Reserve's management plan (ibid).

LEAF Thailand also facilitated and funded a Training of Facilitators workshop attended by members of the MAB Reserve office to strengthen their capacity to promote awareness about the importance of conserving local natural resources (Wongsa 2015a). LEAF Thailand considers this phase of its work to be a success. The outcome was the result of a considerable time and effort to bring together a diverse group of stakeholders to form a coalition motivated to conserve the natural and community resources in the area, largely through expanding the existing narrative and relationship to forests in the region.

### 2.3.2 PES Awareness Building Campaign

The concept of payment for ecosystem service was popular with several organizations in Thailand at the time of LEAF's inception, because of its potential to bring income to rural villages while at the same time conserving natural resources (Wongsa 2015a). Several organizations such as Biodiversity-Based Economy Development Office (BEDO), the United Nations Development Program and the Regional Environmental Office in Chiang Mai, hoped they would be the first to get a PES project operational. LEAF Thailand staff explained that at the time everyone was trying to do a PES pilot and wanted to be the organization who is the first one to succeed in implementing a PES in Thailand. LEAF Thailand cited several challenges that made initiating a PES project challenging. These included the lack of awareness about the PES concept and implementation process between stakeholders and lack of incentives, governmental or otherwise, to motivate people to participate (USAID LEAF 2014).

The concept of payment for ecosystem services was very new in Thailand and so there was still a tremendous amount of work necessary to make governmental officials, the private sector and local people aware of the concept and interested in participating. Due to the lack of awareness about PES in the MAB Reserve, LEAF Thailand infused the concept of ecosystem services into discussions, including their value and the local requirements to steward them, during the process of developing a management plan. They presented the potential for various economic exchanges that could be negotiated to enhance and monitor the well-being of forests and the ecosystem services they provide.

At the time that LEAF Thailand was trying to develop a PES project there were not yet any good case studies to learn from within Thailand, therefore they adapted ideas from other countries. In February 2012, LEAF Thailand facilitated a

PES study tour for a technical working group from the DNP in Bangkok, representatives from the Protected Area Regional Office 16, and local authorities and leaders to visit a PES project in Lam Dong, Vietnam, to learn first-hand the roles and responsibilities of stakeholders in an active PES scheme. The intention of the study tour was to expose stakeholders to a working payment for ecosystem service project so that they could start to form ideas of how this type of scheme could be implemented in their area.

In a phone interview, the Chief of Party of the LEAF project at Winrock International (May 18, 2017), he provided important historical information about how USAID and Winrock International were linked to the study trip to learn about PES projects in Vietnam. Around 2007-2008, USAID had funded Asia Regional Biodiversity Conservation Program to implement a PES (known locally as PFES) in Lam Dong, Vietnam, which Winrock International implemented. The Bangkok office of USAID was keen to build on this experience and see how this approach could be applied elsewhere. It was at the request of USAID that Winrock International directed the LEAF project to look for other locations in the region where this model could be implemented and supported. Early on Thailand, and specifically Chiang Mai, were identified as having this potential. Thus, USAID's previous work in the region influenced the work of LEAF Thailand to take representatives from Chiang Mai to visit Lam Dong, Vietnam on a study trip.

The international community often uses projects in Vietnam as a model because there are many in operation, but participants from Thailand questioned whether examples of payment for ecosystem service projects in Vietnam would be sustainable and could translate in the context of power relations in Thailand. PES projects in Vietnam are considered to be top down in nature. Generally, the government decides on the type of project and then local administrations and

communities follow along. Study trip participants from Chiang Mai expressed that there was no way a PES project could be implemented in the same way in Thailand as it was in Vietnam. The context in Thailand was too different. The political context in Thailand allows for more disagreement between the government and communities around forest and land use than in Vietnam. They also cited that these projects were not voluntary, but instead required by the government, and in fact, it could be argued that they were not true or pure payment for ecosystem service projects at all. Still, this PES study tour gave participants a tangible PES project they could reference as they expanded their own thoughts and discussed with others possible ways to implement PES projects in their own area.

> "When we came back we talked quite a lot about how to adapt the Lam Dong, Vietnam, PES project in Thailand. The political context in Vietnam and Thailand are quite different. Lam Dong has quite a big implementation site but their PES is like the governmental payment scheme. It is just the government through the electricity company that pays local villagers, not the private sector" (LEAF Thailand, PES Project Officer).

In 2013, LEAF Thailand technically and financially supported another training trip to Laos for additional stakeholders from within the MAB Reserve. This second trip was organized for local community members and representatives from the private sector. They attended two workshops to better understand the concept of payment for ecosystem service and mechanism design (Wonga 2015). The staff of LEAF Thailand also went to Hanoi, Vietnam, to participate in a 'Lessons Learned' workshop to learn about the successes and challenges of other payment for ecosystem service projects in the region. They visited other organizations to see the scope of their work and the challenges they were facing.

From the perspective of Winrock International, AURA PES was not meant to revolutionize things revenue-wise. LEAF and DNP were interested more in creating a working 'proof of concept. They wanted to show that even at a modest scale that PES could work. This included proof that stakeholders could be brought together, some money could be exchanged and a demonstrated environmental improvement could be shown in the form of restored degraded areas. They hope that if a small scale, short-term project could be successfully implemented, trust could be built between stakeholders and lessons could be learned about how to make it sustainable and replicable in the future.

### 2.3.3 Identifying Potential Ecosystem Services and PES Stakeholders

After several years of effort, the MAB Reserve management plan had been approved and was operational, and the groundwork had been laid for a basic understanding of a PES project. LEAF Thailand published a case study about land tenure in the region and a review of policies related to payment for ecosystem services. This information, as well as on the ground experiences, were used to guide decisions on the development of the pilot payment for ecosystem service project.

LEAF Thailand and the Protected Area Regional Office 16 – MAB technical working group then agreed to focus on watershed restoration and a PES pilot project in the Mae Sa watershed, one watershed of many within the MAB Reserve. They conducted many meetings with potential private sector participants and began to network the private sector and local communities in activities such as tree plantings. LEAF Thailand tried to identify potential PES project stakeholders such as governmental organizations, local groups, community groups and private sector businesses throughout the 20 sub-watersheds that make up the entire Mae Sa watershed. This was a time-consuming process.

With only two of the staff at LEAF Thailand to approach the many potential private sector actors in the watershed, the task was enormous. They often felt like they were trying to 'sell' the concept and that this was rarely successful. LEAF Thailand PES Project Officer shared, "It is about a general understanding and actually, I think it is about the benefit that they will get by being involved with this, so we have to calculate for them." Some private sector actors also felt like they were being singled out to buy ecosystem services when they knew that many other actors were also using these same services.

Many private businesses were approached about committing to engage in a PES project, including resorts and tourist companies such as elephant camps and zip-line operators. LEAF Thailand staff explained that over and over businesses expressed interest but requested more information or additional time to commit. For example, staff from an elephant camp expressed interested in being more involved in a PES project after participating in a tree planting activity. LEAF Thailand crafted and submitted a draft proposal to them. Sometime thereafter, they participated in a tree planting activity but the survival rate for the trees was very low because elephants in the area stepped on and killed 80% of the seedlings. Progress then slowed and did not translate into an actual PES agreement. The Mae Rim Waterworks, which supplies many communities, governmental agencies and industrial areas with water pumped directly from the Ping River also expressed interest in participation, but decided to engage in a PES project supported by another organization.

In this regard, Aura Company was a leader. They catalyzed interest into commitment and fast action. Their financial process usually requires two to three years of advance planning for new budget allocations. In order to overcome this time constraint, they decided to use an 'emergency budget' to fund the project. This decision was crucial to the momentum and ultimate success of the project.

## 2.4 The Service Buyer - Aura Mineral Water Company

Aura Mineral Water Company (Aura Company) is the sole ecosystem service buyer in AURA PES. The Aura Company's mineral water bottling factory in located in the Pong Khrai subwatershed of the main Mae Sa watershed, in the district of Mae Rim. The factory has been in operation since 1985. Aura Company's bottled mineral water was previously manufactured and distributed by Thorani Pipat Public Company Limited, which was acquired by Tipco Foods PCL (formerly known as Thai Pineapple PCL) in 2005 (Wongsa 2015b). Tipco Foods PCL produces and distributes a wide variety of foods and pharmaceutical ingredients in addition to Aura bottled mineral water (ibid). Tipco Foods PCL is considered the beneficiary/buyer that provided funding for AURA PES in order to enhance what was vaguely termed as 'water related ecosystem services' provided by watershed forest restoration uphill from the Aura Company's bottled mineral water source.

In a video viewed during a site visit to the Aura Company factory (Dec. 2, 2015), the process of filtration and bottling was explained. The water was shown to originate high in the mountains near the park at 2,700 feet. Two layers of filters, at five and one micron, are applied, followed by an ozone treatment. Aura Company's bottled mineral water has won many awards and certifications. They base part of their brand on the perception of a natural water source originating in upland areas. The label on their bottles includes a drawing depicting rainwater filtered through strata and collecting on high mountains before springing out of the ground.
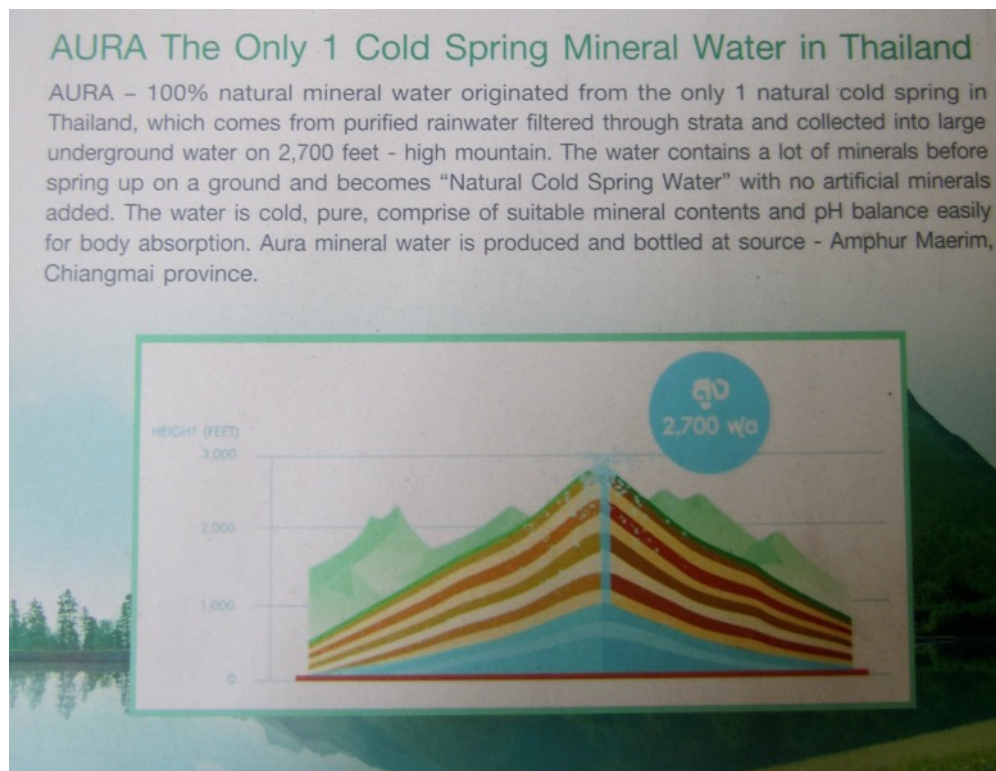
Figure 2.3 - Aura Company branding board– "only natural cold spring in Thailand"
(Source: Aura Company factory information board)

It was the Aura Company that originally identified water related ecosystem services associated with forest restoration as an activity they would like to support. They believed that many of the areas upstream from their factory were environmentally degraded. The factory manager stated that Aura Company wanted a healthy ecosystem around their water source and wanted to be a part of the success of this restoration process. LEAF Thailand considered Aura Company to have a good perspective on the environment.

These beliefs were evidenced by a history of corporate social responsibility (CSR) projects, including building check dams and fire breaks, an annual tree planting, donating bottled water for events. In a presentation at the bottling plant the Aura Company Factory Manager expressed that their CSR projects often felt like one-way dialogues that were not sustainable. They were not sure about the survival rates of the trees they planted.

Unfortunately, tree plantings were often done with only one species and were forgotten after the photograph is taken. Representatives at Aura Company felt that the new practices introduced by AURA PES offered a more sustainable way to restore forests.

Aura Company representatives were invited to many of the preliminary PES meetings as well as to workshops in Vietnam, so that they could compare CSR and PES projects, and see if PES was a good fit for them. LEAF Thailand also facilitated firsthand experiences that allowed the Aura Company to conceive new ways to implement their corporate social responsibility program and the process that would be required to negotiate payment for ecosystem service projects with local communities. Aura Company was interested in supporting AURA PES is because they believe that investing in watershed ecosystem services will benefit them in the future.

Once Aura Company agreed to participate, discussions began about the type of ecosystem service that the project would focus on. The staff at LEAF Thailand were aware of the criticism that many projects that were called payment for ecosystem service projects were not related to any ecosystem service in reality. They were intent on trying to maintain this connection to an actual ecosystem service throughout the process. However, ecosystem services are regarded differently depending on the position of the stakeholder and their corresponding relationship to the forest being investigated. The very general ecosystem services ultimately referred to in LEAF reports are "maintaining and enhancing the quality and quantity of ecosystem services provided by the watershed" (Wongsa 2015a: 18).

Aura Company was interested in supporting AURA PES because they believed that stewarding ecosystem services provided by forests would benefit their water source in the future. In addition to the perceived benefits to their water source resulting from successful forest restoration efforts upland of their water source, Aura Company has the satisfaction of knowing that their CSR program is supporting tree planting activities that are more

sustainable than their previous efforts. They take pride in being a leader in this kind of project in the region. They believe the success of this project will encourage the other private businesses in the area to be interested in joining future payment for ecosystem service projects.

> "Earlier we just give money for corporate social responsibility projects, but never saw the results. Now the villagers have more knowledge and tools and they are invested in caring for their environment," Chief Operating Officer at Tipco Foods, Aura Company (Winrock n.d: 29)

It is also hypothesized that Aura Company was motivated by the positive reputation that was associated with participating in AURA PES. One piece of evidence for this is that they were originally interested in forest restoration for an area of 20 rais, twice as large as the decided 10 rais. However, Aura Company and members of Pong Khrai village decide that this was too ambitious, and required too much work to be successful with the funds available. It is in the expressed concerned that a project of this size would not be successful and would hurt the reputation of both Aura Company as well as Pong Khrai village that we can see the importance of reputation in participation. With their reputation in mind, they decided instead on a 10 rais planting site.

Additionally, through their participation in AURA PES, Aura Company received a lot of free positive marketing in the form of participation at AURA PES events, media reports, awards and even education boards describing their successful partnership in the nearby National Parks. All of this high-profile publicity has a positive impact on Aura Company's reputation of corporate social responsibility. In figures 4.4 and 4.5 we see an example of an informational board at Doi Suthep National Park Visitor Center highlighting success of AURA PES project and the role of Aura Company. This positive 'free marketing' is likely to have influenced Aura Company's decision to participate in AURA PES.

Figure 2.4 – Informational board at Doi Suthep National Park



Figure 2.5 – Section of information board highlighting success of AURA PES

**2.5 The Selection of a Service Provider – Pong Khrai Village[1]**

  Aura Company wanted to select a planting site in the same watershed as their bottling factory. They are located in the Pong Khrai subwatershed which covers 5,149 rais (824 hectares) and is upstream within the Mae Sa watershed (Wongsa 2015b). All three rivers within this subwatershed drain into the Mae Sa River. Nong Hoi and Pong Khrai are the only two villages located in the same subwatershed as the Aura Company. LEAF Thailand and FORRU organized a meeting for both Pong Khrai and Nong Hoi in Nong Hoi village.

  When asked why Pong Khrai was chosen over Nong Hoi to participate in AURA PES several differing answers were offered. One was that while Nong Hoi was informed about the project they did not fill out an application. Others were that Nong Hoi already had outside assistance in the way of the Royal Project and that while it was in the same subwatershed as Aura Company it was not in Pong Yang subdistrict. Finally, the fact that Nong Hoi is located inside of the National Park system may have made the prospect of developing a project there more complex than in Pong Khrai and more time consuming than the LEAF Thailand timeline allowed for. Pong Khrai within the MAB Reserve but considered part of the buffer or transition zone, outside of a nearby National Park. LEAF Thailand discussed options with the technical working group at DNP and they decided Pong Khrai was the best choice.

  Once Pong Khrai and Aura Company agreed to participate LEAF held numerous meetings to strengthen the relationship between these two key stakeholders and to build more awareness about the concept. They discussed possible implementation methods for the project and clarified the roles and responsibilities of each actor. These meetings were held at the Aura Company bottling plant and at the Pong Yang subdistrict office.

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[1] In maps, government reports and documents used for this research, many different versions and spellings are given to the name of this village including: Pong Krai, Pong Khrai, Phongkhrai, and Ban Pong Khai. The standard version used for the purposes of this research report is "Pong Khrai."

Figure 2.6 – Meeting of AURA PES stakeholders at Aura Company plant
(Source: FORRU staff)

Participants in Pong Khrai village are the sole service provider of ecosystem services in AURA PES. Pong Khrai village is located in the Pong Yang subdistrict of Mae Rim district of Chiang Mai Province in northern Thailand and is considered a village unit administratively (Wongsa 2015b). Pong Khrai village is located at ~1,300 meters (Aura Company is located at ~1,000 meters). The map in figure 1.5 points to Pong Khrai village and situates it within the Mae Sa watershed. In 2006, the population of Pong Khrai village was estimated at 256 people, mainly of northern lowland Thai ethnicity (ibid). Women represent 45% of the population and 18% are under the age of 16 (ibid).
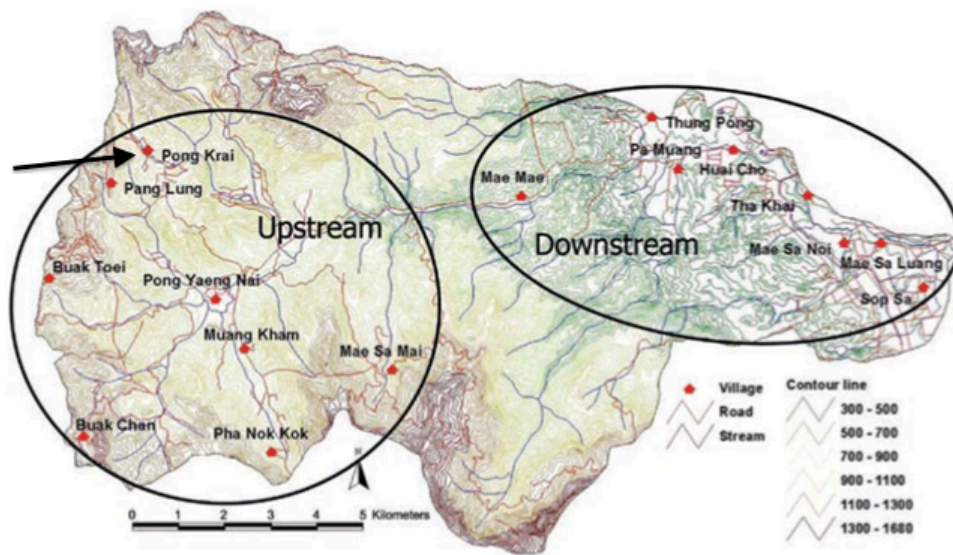
Figure 2.7 Pong Khrai village situated within Mae Sa watershed

(Source: Wonga 2015)

From the perspective of LEAF staff, Pong Khrai residents are not considered migrants but rather long-term residence that are believed to have settled in this area for 'a long, long time'. The village is also thought to have very strong internal relationships and organization.

> "Every household is in possession of a motorcycle, a television set, a satellite dish, and a refrigerator. Eighty-six percent of the households own pick-up trucks; 79% own washing machines; 71% own mobile phones. Although there is no report on income of Pong Khrai population, the Office of National Economic and Social Development Board of Thailand reported that an average monthly income per household in agricultural sector in 2013 was THB 17,582 or approximately US$586 at the exchange rate of THB 30 per US$" (Wongsa 2015a: 20).

Fifty-seven percent of the residents of Pong Khrai village have attended high school while another 36% have an elementary education and a small number have attended college (ibid). Additionally, a paved road connects Pong Khrai village directly to Chiang Mai and the national road system. Many residents have employment outside of the village including

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at Aura Company and in Chiang Mai city. There are several small cabins for tourist and a zip-line operator which employs residents of the village.


Figure 2.8 - View over Pong Khrai village

This research showed that the residents of Pong Khrai village have diverse income sources and are not 100% dependent on the forest for their livelihood. This is important because allocating land for forest restoration has less impact on resident's livelihood and therefore it was less likely that they would the forest restoration plans proposed by AURA PES. This made it easier to start and more likely to be successful, because there was already a similar orientation towards forest management to build on, even though this understanding had little in common with understandings of global climate change that originally catalyzed the project. Residents of Pong Khrai had attempted to plant trees in past to correspond with the King's birthday but had not been successful in keeping the tree alive and survival rates were very low.

**2.6 The Local Forestry Expert - Forest Research Restoration Unit (FORRU)**

Once the Aura Company and the participants of Pong Khrai village were linked for the project, LEAF Thailand asked Forest Research Restoration Unit (FORRU) to join the project as a local forest restoration expert. FORRU, established in 1994, is a research unit of the Faculty of Science at Chiang Mai University and is based in the Faculty's Biology Department. FORRU's mission is "to carry out research to develop efficient methods to restore tropical forest ecosystems for biodiversity conservation, environmental protection and carbon sequestration" (www. forru.org). FORRU had previous experience in the Mae Sa watershed and had been involved with forest restoration in the area for more than 20 years. They offered their expertise in the budgeting and planning process and provided several trainings to Pong Khrai participants in forest restoration techniques to support the development and implementation of AURA PES.

Since 1997 the unit had been adapting the framework species method of forest restoration to local conditions. The technique involves choosing tree species from amongst the local forest tree flora that survive well and grow fast in degraded sites, shade out weeds and attract seed-dispersing animals (Elliott et al. 2013). When planted well, and looked after for the first two rainy seasons, the planted trees close canopy rapidly and foster rapid biodiversity recovery.

LEAF Thailand promoted new forest restoration expertise by facilitating and funding FORRU trainings for participants aimed to assist with site surveys, site preparation, planting, species selection, planting planning, financial planning, monitoring, and maintenance. Pong Khrai village participants contributed their knowledge of what trees were useful for them and at the same time trees were consciously chosen that did not have timber value. Together, they identify suitable species for the area, including the altitude, and the number of each kind of seedling that would be needed so that they could begin to grow them in a nursery.

Many of the new techniques that FORRU provided during these trainings were new to the training participants. It was agreed that FORRU would help participants for the first two years. After making sure the participants knew how to prepare, plant and monitor the trees, it was expected that the participants would have gained the new expertise and would be able to continue and repeat the process by themselves. LEAF Thailand PES Project Officer described the relationship between FORRU and Pong Khrai village.

"Pong Khrai could plant trees by themselves before but they admitted that after FORRU came to teach them they got a lot of good knowledge to implement in the way of forest restoration. They taught the villagers from the beginning, from the seed collection and the taking care of the seeds. They showed then how to propagate seedlings in a nursery, how to transfer them to the planting site, and how to plant and monitor them properly."

Stephen Elliot, Co-Director of Chiang Mai University's Forest Restoration Research Unit (FORRU) explained that they were motivated to restore forests in order to expand habitat for wild animals. In addition to biodiversity conservation, their work with Pong Khrai allows them to improve their methods. By being involving in the monitoring and evaluation practices of the project they are able to collect valuable scientific data to understand how different methods are working in different areas. For example, FORRU used to project to collect data on the effectiveness of using cardboard mulch mats to deter weed growth. This method was not ultimately used in this project.

## 2.7 The Local Subdistrict Administrative Organization

LEAF Thailand staff considered the head of Pong Yang subdistrict administrative organization to be the most important man in the area. He lives in Pong Khrai and his participation in the AURA PES development process not only assisted with networking but also built confidence among the stakeholders. The fact that his assistant is of the Hmong

ethnic group was also thought to be beneficial. During a presentation that he gave at the Aura Company bottling plant (December 2, 2015) he expressed that he would like to see more area reforested in the Pong Yang subdistrict and that he was looking for more organizations or private sector investors interested in supporting this goal.

## 2.8 Summary and Discussion

In this chapter I described the grant making process by which funds from USAID were granted to Winrock International and consortium partners to implement the LEAF project within Thailand. Thailand's positioning in the discourse of global climate change was then discussed to explain LEAF's collaboration with the DNP and DNP's internal forestry goals. The hope is that the reader will see the way in which LEAF Thailand ultimately linked the local goals and dynamics of PES stakeholders in the Mae Sa watershed with the international discourse and the funding mechanism of climate change and carbon sequestration.

At the time that AURA PES was being developed (2012-1015), no working PES projects existed in Thailand. LEAF Thailand spent considerable time introducing, explaining and discussing the project with potential stakeholders. Once a beneficiary/buyer and a service provider were identified, LEAF Thailand identified and enrolled necessary stakeholders. The operational process and practices of the AURA PES agreement are detailed in Chapter 4.

Winrock International estimated that through LEAF Thailand's work in the entire Mae Sa-Kog Ma MAB Reserve 41,814 metric tons of greenhouse gases were avoided or reduced through improved forest management and protection. Specifically in Pong Khrai village, 75 households are reported to have experienced "improved well-being through sustainable natural resource management as a result of United States government assistance" (2016: 109). I argue that the Thai and United States government collaborated on AURA PES partially to help assess the impacts of PES projects in aims to meet international goals in

climate change agreements. Winrock International estimates that the entire LEAF program reduced or sequestered more than 8 million tons of $CO_2$, improved the natural resource management of more than 1 million hectares of land, and improved the well-being of more than 1 million households (Winrock 2016). These types of measurements reported from programs, supported directly or indirectly by the United States and Thai governments, also help to improve their reputation in regards to climate change action among the international community.

Agrawal (2005) proposed that politics, institutions and identities were interrelated parts of any technology of government and that these components needed to be looked at simultaneously and historically in order to get a more holistic picture of transformations in environmental governance and environmental subjectivity. In order to assess the influence AURA PES had on local beliefs, expertise, practices and perceptions of territoriality, the following chapter provides a historical geography of Pong Khrai, the sole service provider in the pilot project. It describes the transformations that have taken place in this village in relation to land use and territorial claims before the introduction of a PES project.

# CHAPTER 3

# Historical Geography of Pong Khrai Village

This chapter explores how local land use and authority in Pong Khrai have historically interacted with state institutions and with their neighbors. First, a description is provided of the areas between Chiang Mai city and the Mae Sa watershed. Then, personal stories from Pong Khrai residents, including elders, are used as a way of investigating the transformations that have taken place in this village in relation to land use and territorial claims before the introduction of a PES project. Changes in Pong Khrai are described in three phases. These include responses to lived experiences, interactions with state institutions and conflict over land use with a neighboring village.

## 3.1 Descriptive Context from Chiang Mai City to the Mae Sa Watershed

Most of the remaining forests in Thailand are located in the north where AURA PES took place. More than 40 percent of the Northern region is still forested, which is 43 percent by land area of the total forests in Thailand (Office of Environmental Policy and Planning 2000). The north of Thailand has predominantly mix deciduous and dry dipterocarp forests, with evergreen above 1,000 meters. In 2000, approximately 40 percent of the land in Thailand is used for agriculture, 25 percent is forest, and approximately 16 percent is considered degraded land that is not suitable for cultivation (Office of Environmental Policy and Planning 2000). The Thai government's policy is to maintain at least 40 percent of total land area as forests, (25 percent as conservation forest and 15 percent as economic forest) (ibid).

Figure 3.1 shows the decades of decline of forests in Thailand from 1962 to 2004. Note the small rebound after 1999. Figure 3.1 shows forest land distribution in Thailand in 2004.

Table 3.1 Proportion of forest land to total in Thailand, 1961-2008
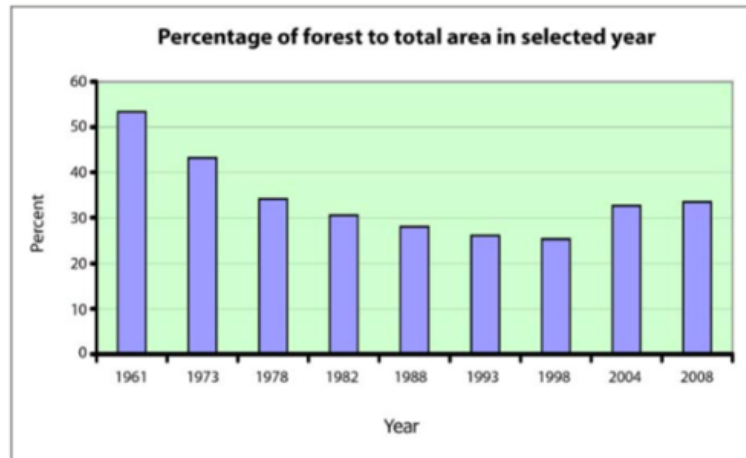


(Source: Office of Natural Resources and Environmental Policy and Planning 2010: 74)
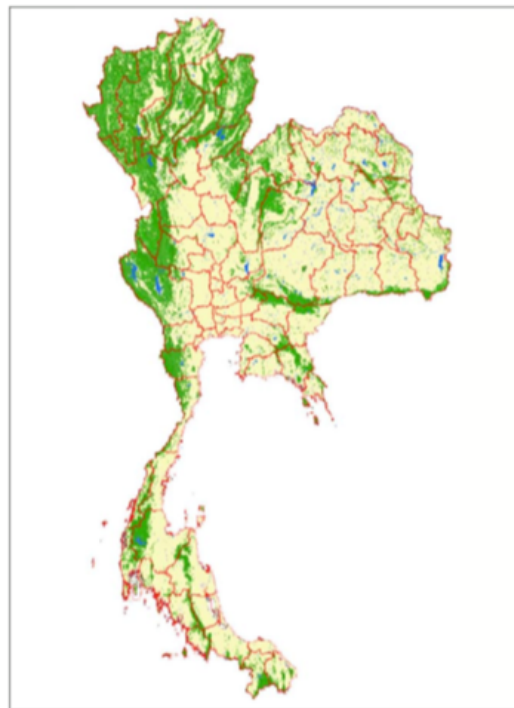


Figure 3.1 – Forest land distribution in Thailand, 2004
(Source: Office of Natural Resources and Environmental Policy and Planning 2010: 32)

In the northern city of Chiang Mai, Lanna culture is vibrantly alive in tradition, in ritual and in everyday life. The west side of the city vibrates with each arriving and departing plane. The airport was considered 'out of town' when it was built, but now appears surprisingly close. The residents never imagined the city would grow to be so large. The planes have contributed to the large influx of tourism in the region, a trend that has clearly impacted the area of the Mae Sa watershed. In the last decades, the Mae Sa watershed has been transformed by increasing agricultural and tourist demands for land and water. It is in this wider context that AURA PES was negotiated and implemented.

If we were to take the one hour drive from Chiang Mai City to the area of the Mae Sa watershed, we would witness many transformations along the way. After leaving the busy network of roads, houses, and businesses of the city, we would find ourselves on a flat, sometimes divided highway 107, which sometimes appears wider than necessary for the two lanes of traffic traveling in each direction. Traveling on the left side of the road, we would drive through several small towns where shops and houses have congregated and the traffic is denser.

It is very likely that we would see t*uk-tuks* (three-wheeled moto-taxis) and *song taws* (covered pick-up trucks with two benches facing each other in the back for passengers) transporting tourists to what the author sometimes thinks of as the 'north realm of tourist attractions' (though, of course, it is much more than that). We would begin to see signs for these attractions in the Mae Rim District, where we would take a left at a traffic light onto road 1096. The choices are impressive. Mae Rim is home to the Tiger Kingdom, several elephant camps (including one that make 'elephant poop paper'), butterfly farms, snake farms, monkey training centers, orchid farms, insect farms, botanical gardens, and several waterfalls. If we were to stop at one of these attractions for lunch, we might find a spacious restaurant, designed with large tourist buses in mind.

A glance at online real estate listings would inform us that there is a plethora of gated 'garden' or 'spa' communities boasting tranquility and easy access to quaint shops, delicious restaurants and trendy coffee cafes. Mae Rim District is also home to several high-end resorts, including the Four Seasons. As we headed west, the road narrows to one lane and begins to twist and gain elevation. Having rounded, at a distance, the northeast corner of the Doi Suthep National Park, we continue to travel loosely parallel to its north border as we enter the Mae Sa Watershed. Approximately two-thirds of the land area in the Mae Sa watershed is designated as a forest zone (57.8% conservation forest and 4.0% economic forest) (Wongsa 2015a). Between 1997 and 2006 an average of 9% of the forest was lost to deforestation, with rates as high as 24% in some areas (ibid). In the last decade, these rates have slowed and in some place begun to rebound.

As we continue to drive west, from the road there would be regular glimpses of the Mae Sa River. We would continue to encounter tourist attractions and varying sizes of resorts woven into the patchwork of homes, along with fruit and vegetable stands. Approximately one-third of the total land area in the Mae Sa watershed is used for these intensive agricultural activities, 80% of which is under irrigation (Wongsa 2015a). There are 22 villages within the Mae Sa watershed, 20 of which are involved in intensive agricultural activities including fruit orchards, crops and flowers for market sale. Strawberry fields and other agricultural activities would become more common as we approached the Pong Yang subdistrict.

In the town of Pong Yang, we could turn right on road 4051, running parallel to the Nong Hoi River. Shortly, we would encounter the Aura Company bottling plant. Inside the Aura compound, just past the guardhouse, we would find large delivery trucks, a warehouse space full of plastic pellets for making bottles, offices, meeting rooms and information boards about their filtration process.

While the downstream lowlands of the Mae Sa watershed are relatively flat and inhabited mostly by people of northern Thai ethnicity the upstream highlands of the Mae Sa watershed are characterized by steeper slopes and inhabited mostly by the minority Hmong ethnic group (Wongsa 2015a). Further north along this same road, we would see an increase in elevation and in agricultural activities. As we continued uphill we would pass the Pong Yang Zipline and Jungle Coaster and come to the Hmong village of Nong Hoi. On the ridge at the top a hill in Nong Hoi, numerous tourist cabins and tents are situated to best take in the views of both the rolling mountains and the picturesque hilltop agricultural fields.



Figure 3.2 - View of Nong Hoi ecotourism and agricultural activities

Not far from here, an unmarked, uneven, and steep dirt road would lead up through cabbage fields to the AURA PES planting site. It is difficult to access without a 4-wheel vehicle, even in the dry season. As this road crests along a ridge and turns left, we would see

expansive views of the area, and the AURA PES tree seedlings growing on a fairly steep hill dropping off to the left.



Figure 3.3 - Surrounding area as seen from the AURA PES planting site
(Source: LEAF Thailand staff)

To visit Pong Khrai village, we would have to follow road 4051 all the way back downhill past the Aura Company plant and into town. If we continue briefly west along the main road 1096 several signs indicating the direction of the Pong Khrai Temple and the Flying Squirrel Zipline would guide us to the right along a narrowing, less even road. Arriving in Pong Khrai, we would notice the temple atop the left hill. It overlooks an area marked by greenhouses for vegetables, orchids and other flowers. There is a small homestay operation, several small resort hotels, a coffee shop and a small convenience shop. We might also notice the new home of the Head of Pong Yang subdistrict, which was being built at the time of this research, in the center of the village. The village is not large and much of it is nestled into a shallow valley. The houses are a mix of cement and traditional Thai architecture, complimented by satellite dishes and chickens. A walk around the immediate area would uncover a number of large 'vacation' homes, often unoccupied but once or twice a year by Bangkok residents.

Figure 3.4 - View of Pong Khrai village

## 3.2 Historical Geography of Pong Khrai Village

If we arrived in Pong Khrai 100 years ago, it is unclear what we would have found. The first official population census of what is now considered Thailand, took place in 1911 (National and Social Development Board 1974). Though the report suggests the accuracy of this census was low, it estimates that 8 million people resided within the borders just over 100 years ago (ibid). Current estimates of the Thai population are approximated at 68-70 million people (Office of Natural Resources and Environmental Policy and Planning 2010), a more than eight-fold increase during the last century. Interestingly, in approximately that same time period, the population of elephants has plummeted from estimates upwards of 400,000 creatures around 1900 (50,000-100,000 in captivity) to less than 4,000 (~2,000 in captivity) just before 2000 (Food and Agricultural Organization of the United Nations 1997).

While the accuracy of historic population estimates of Thai residents, and Thai elephants is problematic for many reason, these numbers give a broad impression of how different the landscape around Pong Khrai village would have been in the past. If we use the

trajectory of the entire Thai population (National and Social Development Board 1974) to hypothesize the Pong Khrai population of 100 years ago, it is reasonable to guess that the only inhabitants were the three families one Pong Khrai elder reported to have started the village. If we fast-forward to 50 years ago, the population of Thailand had increased more than four-fold, with the 1960 census estimated at 26 million people (National and Social Development Board 1974). A male elder (72 years old) reported that there were 12 families in the village during his youth, in contrast to the 80 families that reside there now.

### 3.2.1 Descriptive Context of Research Process

In April 2015, Dr. Wittayapak and I met with members of the DNP at the DNP office to determine if they were aware of any market-based forest conservation projects in the area. The DNP recommended the work of LEAF Thailand. Dr. Wittayapak and I conducted an in-depth interview with the two LEAF Thailand staff most involved in AURA PES during our first visit to their office in Chiang Mai (May 20, 2015). This was less than a month before the AURA PES Kick Off Celebration and Planting Day so we discussed what was happening with the AURA PES project at that time. I returned to the LEAF Thailand office in the DNP building for a second formal interview with the same informants (Nov. 20, 2015). Before then, they invited me on a study trip they had organized for about 15 of their collaborators from Vietnam to participate in presentations at the Aura Company bottling plant and to visit the forest restoration site.

While attending this LEAF Thailand sponsored study trip in December of 2015, I heard a number of AURA PES stakeholders speak about what they thought of the project. These presentations were loosely translated for me by both LEAF Thailand and FORRU staff and included the Aura Company factory manager, a member of LEAF Thailand, the Head of Pong Yang subdistrict, and several members of Pong Khrai, some of whom were on the AURA PES Committee. The same day I

went with the group to visit the AURA PES planting site for the first time and meet several members of Pong Khrai who were involved in the project. Through these interactions, I was able to make arrangements to meet with the Pong Khrai village headman and other residents of Pong Khrai.

On my first visit to Pong Khrai, I went with a Thai translator. The interviews that took place in Pong Khrai were casual but with formal introduction, explanations of purpose and permission granted to tape record the conversations. We met with the village headman under an awning in front of his house among trees and the sounds of chickens. It was one of the AURA PES weeding days and his walkie talkie regularly transmitted updates about how the process was going. After speaking with him for several hours he invited us to walk around the village and talk to anyone that was available and interested. He offered that his mother and the assistant to the village headman were available. They were both interviewed in her nearby wooden house where she was watching after a small child sleeping in a hanging swing.

Walking around Pong Khrai I recognized several committee members from my previous LEAF Thailand visit to the planting site. They were outside a small shop that was selling food and we had an interview with them there. We walked towards the village temple and encountered some children and an elder who agreed to be interviewed. During this interview two teenagers arrived out of what seemed like curiosity and agreed to be interviewed as well. A woman keeping a small convenience shop was interviewed on a bench in front of her shop. It is important to note that no quotations that are the result of translated interviews with residents of Pong Khrai village should be considered direct quotes from informants. They are rather 'paraphrased translations', closely approximating the original conversations.

### 3.2.2 Tree Protection During the Youth of Elders

While land that was ultimately selected for the AURA PES forest restoration site is legally under the jurisdiction of the RFD, historically, it had been managed locally. We can rely on the childhood stories for village elders to get a sense of the changes that have taken place in the surrounding environment, practices of land use, and concepts of land ownership over time. A female and male elder that were long-term residents of Pong Khrai village were interviewed about their memories growing up and specifically about their knowledge of the history of land use in the village. This was then supplemented with memories other residents of Pong Khrai had from their youth and stories of past land use practices, conflicts over resource management or state interventions.

In the 1960's, there was not yet a paved road to Pong Khrai and the Aura Company factory did not yet exist. Most residents were involved in agricultural activities that included rice, potatoes, cauliflower, beans, lentils, corn, taro and sweet potatoes. Very little money was exchanged during this time but a female elder (67 years old) reported that life was neither easier nor more difficult then than in the present, though a tray of fish was certainly much less expensive.

This female elder was born in Pong Khrai and began farming at sixteen or seventeen years old, in the mid-1960s. She had spent the majority of her life living in Pong Khrai and remembers when it used to be all rice fields. She had farmed potatoes, cauliflower, beans and lentils for approximately 20 years, then around 1985 she shifted to other crops including rice, flowers, corn, taro and sweet potatoes. Her parents had left her the land and the rice fields in the back of her property. She stopped farming at 56 years of age. She remembered that there had been a lot more water when she was younger, and less drought. She felt the last ten years has been very dry and therefore less useful for agriculture. Presently, people still grow vegetables for their own home consumption but do not often sell them. Others in Pong Khrai echoed

this story, saying they used to grow many things but now they only grow flowers and fruits like bananas, mangoes and avocados.

The male elder had been born in Pong Khrai and lived there his entire life with the exception of the years he attended school in the city. He began farming in the mid-1950s at age 12 or 13 and said jokingly that he had farmed everything: rice, vegetables, fruit, … everything. He also recalled hunting in the forest when he was young. He remembers a lot of wildlife at that time including tigers, snakes, deer, wild pigs, several types of monkeys, and even bears. They hunted these animals to eat them or in the case of the tigers, killed them because they attacked their domestic animals. Their past hunting efforts must have been quite successful as present day children between age seven and 14 years old that were interview in Pong Khrai village reported that they had not seen any of these larger forest animals, with the exception of a few wild pigs near the forests. The animals they had encountered included centipedes, spiders, squirrels, snakes, birds, and a lot of bats.

The male elder described how Pong Khrai residents participated in slash-and-burn agriculture when he was young to clear weeds and grasses before planting a field. He explained that the fire would turn what it burned into fertilizer. If the fire was not hot enough the weed grasses would return and disrupt the crop. He recalled that sometimes the fires would get out of hand and the fire alarm would ring. You could see a lot of rings of fire in the night. Someone might intend to burn 3 or 4 rais but then the fire would get out of control and burn much more. In the past (and still now), individuals would build a fire buffer zone around their own home. In the past, most people were farmers, and farmed land near their homes, so they could take care of their own buffer zone.

The elder man remembered that the forest of his youth had much larger trees than the smaller ones we see now.  He described tree diameters as large as five, six, or even seven people across.  He said many of these large trees had been 'wasted' in past fires. He explained that if the local river was divided into the beginning, middle and end sections, that the beginning sections had been cleared of large trees by the time he was around 10 years old (early 1950s). He also recalled that there used to be more water flowing in this area, but now it is all but gone.

Within Pong Khrai there were many stories that showed that watershed forests are considered the source of the quantity and quality of the water supply. An elder explained "there is a forest which gives out the water and that is the originator of the watershed."  Further, the humidity in the dense forests, normally located high in the hills, accumulates drip by drip, drop by drop, so that it will continually produce a flow of water from that point. The planting site is considered part of a larger area referred to as *Pa Pui Nam*, which translates to 'water springs up.'

Others had also noticed the disappearance of large trees at the beginning of the watershed and associated this with a decline in the water supply. In reaction to this they collectively decided to conserve the larger trees in the middle section of the river.  He explained that in the middle section of the river there were some large trees left, not many but some, and that if they had not made the decision to protect these trees that they would already be gone too. This decision to protect trees in a certain part of the watershed is the first change in practices reported by Pong Khrai residents. It took place in reaction to a belief that the clearing of trees in particular areas of the watershed would decrease the supply of water in the village.

### 3.2.3 Interactions with State Institutions

Prior to 1960, more than 50 percent of the total land area in Thailand was classified as forest; however, logging, expansion of agriculture lands and the mismanagement of forest concessions are cited as the main causes for the loss of forests, along with population growth and economic expansion, which all slowly contributed to decreases in the amount of forested land (Office of Environmental Policy and Planning 2000). This decline catalyzed a change in the government's policy from one of efficient forest utilization to one of forest conservation. In the 1970's, the Thai government began to take measures to expand forest areas. This date may coincide with the arrival of a road in Pong Khrai which provided easier access for forestry officials.

> "The making of environmental subjects …is concerned with how human understandings and relations to forests change historically with the extension of centralized rule over forests and later with the emergence of the governmentalized localities and regulatory communities" (Agrawal 2005 p.16).

Many changes also took place after the paved road network touched Pong Khrai in the early 1970s. For possibly the first time, the RFD introduced themselves in Pong Khrai and one elder resident remembers that the RFD claimed rights to the surrounding land in approximately 1974 (2518). RFD representatives began to deter people from using slash-and-burn methods. The elder recalled that representatives from the Center of Resource Management also suggested that they create larger fire buffer zones to protect against the spread of fire. The representatives also told them that if they have a lot of forest fires that they will not have as much water.

At first, they were skeptical, he recalled. Then one year there was very little water, which was the cause of great concern. It was again this concern about the water

supply that began to motivate people to establish new practices. Over time, they began to diminish burning methods and to increase practices that provide protection against the spread of wildfires. It is not clear to the author how much the RFD asserted their power in this area at this time but many of their new ideas toward wildfires gained legitimacy and were adopted.

During this time, new methods of state territorialization were also introduced. For generations land ownership in this region had been tied to local understandings and actual land use rather than any formalized state titling. This is not to say that the concept of land ownership did not exist in the past, but rather that it has as much to do with local understandings and agreements as it does the authority granted by a state title. Recent data from Pong Khrai village illustrates that many systems still exist and land continues to be farmed both with and without state land ownership deeds.

> "A total of 75 households in the community are engaged in agriculture on an average landholding of 3.36 rais per household (0.54 hectares). Ninety-one percent of the agricultural area, which totals 245 rais (39 hectares), is under irrigation. Only one third of this agricultural area is farmed by the owners holding permanent land ownership deeds. One-fourth of this area is utilized without permanent deeds or without any deed at all; the rest of the area (45%) is on leasing term" (Wongsa 2015a: 20).

The village headman of Pong Khrai village explained that there were three types of state land classification in the area of the Pong Khrai village. The first was described as land that had a title and is therefore legal. The second he called *Nor Sor Sam* in Thai. He described this as land that you are allowed to use within ten years, but you are not allowed to trade or sell it. Generally, this land is purposed for

agriculture. He believed that in rare cases one might be able to sell or transfer the land after ten years, it but it was not common. The third type of land is also for agriculture purposes and has no title. It is not clearly demarcated, but is associated more with the labor that someone is able to extend to farm the land.

The Pong Khrai village headman himself has nine rais of land in this third category. The land has been passed down through his family who came to possess it by living on it and farming it. His land is still under his grandmother's name. Even though she is no longer living, the land has not transferred to his mother yet. His mother felt that there were not any conflicts over transferring land in the village. Everyone knew whose parent's property belonged to by who had used it in the past and the land was always transferred to a relative first. This illustrates that even with the introduction of state land titling practices, local customs still persist.

In a second phase of changes in land use practices and territorial perceptions, Pong Khrai residents reacted to interactions with state officials. There was a shift away from slash-and-burn agricultural practices encouraged by RFD representatives and the implementation of enhanced wildfire protection. Some residents of Pong Khrai also registered in state land titling programs, while others did not.

The arrival of the road brought other changes with it as well. A female elder recalled that before the road access to higher education and medical care was more difficult. While Pong Khrai residents are still involved in intensive agricultural activities, these are now mainly contained within greenhouses, and are not considered land intensive cash crop agriculture. Many Pong Khrai residents have stop farming as a livelihood all together. They may keep a garden or fruit trees for personal use but they have work outside the village. This includes employment at Aura Company, the nearby Botanical Gardens and jobs in Chiang Mai city.

Figure 3.5 - Pong Khrai village greenhouse

### 3.2.4 Negotiating Local Territorial Conflict

The land used for the AURA PES planting site had historically been used by different people for varying purposes. A female elder spoke of a time "a long, long, long time ago" when the neighboring Hmong residents in Nong Hoi village would asked permission to cultivate more land in the area between the two villages and the Thai residents in Pong Khrai would 'kindly' let them use it. Whether this was in her lifetime, or before, was unclear. What was clear is in the more distant past these two villages were able to negotiate land use agreements.

While sometimes these agreements were made, there were also concerns about the impact on the water supply. One elder spoke of how Nong Hoi village burned more and more land for cultivation every year. The Pong Khrai village headman explained that up until about 30 years ago, the residents of Nong Hoi village still practiced what is known locally as shift-and-burn agriculture extensively.

Another elder recalled how Pong Khrai residents also used to practice a similar method to extend their land for growing rice. He recalled light heartedly that in the past, Pong Khrai village residents had used this method "a lot, as much as the Hmong, we would burn the fire." But Pong Khrai no longer practiced these methods and felt concerned about the amount of land that was being used for the shift-and-burn practice in the watershed area above their village.

Though the Pong Khrai village headman was only nine or ten years old when conflict began, the events left a long-lasting impression on him. His perspective may also have been shaped by the stories that elders told. During preliminary research the headman often mentioned this past conflict with Nong Hoi village during visits to the planting site. He told animated stories about the burning of field huts used by farmers near the planting site as part of this conflict.

The headman estimated that in seven or eight years of time that more than 1,000 rais (160 hectares) of forested land between the two villages had been cleared. From his point of view the residents of Nong Hoi village had encroached on the forest by clearing land in order to grow opium which they followed with vegetable cultivation. He associated this loss of forested land with decreases in the water supply.

Two members of the AURA PES committee described how they tried to protect trees in the area twenty years ago. During the year after a memorable drought they could not earn any income from agriculture because it had been so dry and so hot. The following year they worked with others to wrap monk cloths around trees in order to protect them through a ritual of ordination. These two informants felt a part of the tree ordination movement that was happening in Thailand (Isager and Ivarsson 2002) and referenced documentaries that had been made about ordination events.

The AURA PES forest restoration site is located within the area where Pong Khrai and the neighboring Nong Hoi village had past territorial conflict about how upper zone watershed forests should be used and who had the authority to manage them. It is necessary to drive through Nong Hoi cabbage fields in order to access the AURA PES site by dirt road. It is important to place Pong Khrai's descriptions of this past land conflict into the broader context of state intervention towards slash-and-burn practices.



Figure 3.6 - Nong Hoi monoculture, cash crop fields on the way to planting site

"Even though shifting cultivation is an essential form of agricultural practice that many hill populations rely on to feed themselves it never really has any positive aspect in the minds of most government officials" (Ganjanapan 1987: 507)

There are many forms of slash-and-burn agriculture (with varying practices and periods of cultivation and fallow) and some people have supplemented other types of farming with these practices for generations (Ganjanapan 1998). Some swidden agricultural practices (also known as shifting, rotational or slash-and-burn agriculture) can produce hundreds of useful plant species (ibid). In Vietnam, local focus groups of swidden cultivators had uses for all 22 plant species that were found in a small transect of a 'bare hill' and did not refer to these areas as 'degraded' but rather as 'fields' (McElwee 2016). Ecosystem system foraging was also common in order to collect building materials, household objects, fire fuel, medicine and nutritional sustenance (ibid).

Swidden cultivators see the forest not just for birds and animals but as the livelihood of people as well. Some of these methods rotate though previously cleared land and don't not require clearing of new forest land (McElwee 2006). While government officials often assume that people practice rotational cultivation due to soil erosion, the principle reason is because farmers cannot compete with weeds (Ganjanapan 1998). Diverse practices such as long fallow rotational systems and pioneer shifting cultivation were mostly replaced with a short fallow, degraded rotational system due to pressure to permanently settle (ibid). Many households once dependent on forests for subsistence now rely on cash crops instead (McElwee 2006).

Shifting cultivators are often ethnic minorities and face insecure land tenure and threat of relocation which they have resisted in a variety of ways (Ganjanapan 1998). Government intervention to decrease swidden or rotational agriculture practices have also had unintended consequences. Subsistence production is undermined and roads built to allow the promotion of government policies have also allowed greater access for commercial exploitation of forests and can pressure farmers to go deeper into the forest in search of land to cultivate (Ganjanapan 1998).

Programs intended to substitute opium with cash crops inadvertently encouraged the clearing of more land as cash crops only provide one-tenth of the revenue as opium would for the same amount of land (ibid). The shift in northern Thailand since the 1960s from subsistence farming towards commercial production has made water competition a 'major problem' for most people (Ganjanapan 1998). This increasing commercialization coupled with the establishment of state protected watershed areas has been followed by an increase in land boundary disputes (Ganjanapan 1994).

The Pong Khrai village headman believes that it took almost ten years to resolve this physical conflict over the land. It quietened down approximately 20 years ago. Nong Hoi village has been collaborating with the Royal Project and is currently involved in extensive, land intensive, monoculture, cash crop agriculture. The Royal Project helped negotiate an agreement for the border between the two villages along a mountain ridge. Then approximately 10 years ago, a physical demarcation in the form of a dirt road that acts as a firebreak was cut along the mountain ridge. There is also now a law that protects Pong Khrai village from what they consider encroachment by the Nong Hoi village.

Most of the AURA PES stakeholders interviewed in the course of this research felt that the past land conflict with the neighboring Nong Hoi village was just that, a thing of the past. The Pong Khrai village headman expressed that relations were now great with the Nong Hoi village and that "the two villages were like brothers." While the road may have clearly demarcated the territorial boundaries between Pong Khrai and Nong Hoi several informants mentioned concern about Nong Hoi village's current lack of fire prevention awareness. One elder stated that about five years previous she and others had lost a lot of sleep because of nearby wildfires.  Even though it is illegal to burn in this area, it is still common. Pong Khrai

residents were not able to identify exactly who set the fires, but they associate the visible results with their neighbors' fire practices.

The Pong Khrai residents reacted by intensifying their fire prevention practices. Guided by the village committee, they invested a significant amount of money and labor to survey and clear a fire buffer zone before the watershed. They rented a small micro grader to level the land where it was not smooth and made several layers of buffer zones. When there are signs of a nearing fire, announcements are made over the village loud speaker and everyone who is able comes to help with protection measures. Pong Khrai informants believe that it is important for Pong Khrai to have a very good fire prevention system in place and they continue to improve upon it in small ways.

In this third phase, Pong Khrai residents began tree ordination practices and intensified the practices of fire prevention in response to what they considered forest encroachment. The neighboring village had decreased the use of slash-and-burn practices and expanded land use for agricultural cash crop in collaboration with the Royal Project, who help negotiate the border between these two villages about 20 years ago. Approximately 10 years ago this border along a on a mountain ridge was marked by a dirt road. The AURA PES planting site is located along this road.

## 3.3 Summary

The history of territorial claims is complex on the land that was designated for the AURA PES forest restoration site. This chapter examined the history of local beliefs and practices existed among in Pong Khrai previous to participation in AURA PES. Personal stories from Pong Khrai residents formed the foundation for exploring past perceptions of land use, land rights and authority over land tenure including a period of land dispute with a neighboring village.

Agrawal wrote "new environmental subject positions emerge as a result of involvement in struggles over resources and in relation to new institutions and changing calculations of self-interest and notions of self" (2005: 3). Pong Khrai participants have engaged in new environmental ideas, practices and forms of governance in the past, partially due to future notions of self-interest and partially in response to struggles over watershed forest management. This has taken place in the context of shifting and expanding government policies towards forest management. "A desire to protect commonly owned or managed trees and forests, even with the recognition that such protection could enhance one's material self-interest, subscribes to environmental subjectivities. In such situations, self-interest comes to be cognized and realized in terms of the environment" (Agrawal 2005: 165).

Chapter 4 discusses the practices and operational process of the AURA PES agreement. It investigates how the AURA PES planting site was chosen, approved and demarcated for forest restoration purposes. The role of stakeholders in developing an oversight committee and project mechanisms are examined, as are the initial reactions to new forest restoration practices. Finally, the potential and challenges of replicating the project are discussed before the research questions are addressed in the final chapter.

# CHAPTER 4

# Overview of the AURA PES Agreement

Chapter 4 describes the operational process and practices of the AURA PES agreement. This includes the site demarcation, details of the three FORRU trainings, the process of budget and activity timeline creation and AURA PES committee and payment mechanism development. The 'Kick Off Celebration', 'Planting Day' event and the specifics of restoration activities are examined as is the role of the local forest restoration expert FORRU from Chiang Mai University in the ongoing implementation of AURA PES2 after the LEAF Thailand project ended.

## 4.1 Operational Process and Practices

From January 2015 until June 2015, LEAF Thailand focused most of its efforts on operationalizing the payment for ecosystem service project that would become known as AURA PES. AURA PES is fairly straightforward on paper. It involves only one beneficiary/buyer (Aura Company) and one service provider (Pong Khrai village). Aura Company agreed to pay Pong Khrai village 200,000 THB (approximately $6,060 USD) over a two-year period for specific activities that were deemed to enhance water related ecosystem services. Pong Khrai agreed to complete these activities in the form of forest restoration efforts on a 10 rais plot of land. The AURA PES agreements and mechanisms included site demarcation with Geographical Positioning System (GPS), and collaboratively deciding on a project budget, a timeline of activities and a mechanism for payments.

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### 4.1.1 Planting Site Selection and Demarcation

Once Aura Company, Pong Khrai village and FORRU had agreed to partner in a PES project, LEAF Thailand invited DNP and RFD representatives, along with local stakeholders, in a process of identifying degraded areas. The AURA PES agreement required that land had to be chosen, approved and demarcated for use as a forest restoration site. Even at its small scale, the project required a process of renegotiating state territoriality in order for land to be set aside for the operation of the project. Land considered to be forested in the Mae Sa watershed is under jurisdiction of several different agencies, including the RFD and the DNP.

LEAF believed it was essential for the success of the project that these government agencies not only be informed of the project, but more so, be willing to participate in the development process in a way that the project gained their approval and authorization. While LEAF Thailand worked in collaboration with the DNP the site ultimately chosen as the AURA PES planting site in the upper Mae Sa watershed is considered degraded class 1 (erosion-prone) watershed area and is by law within the jurisdiction of the RFD. LEAF Thailand contacted RFD who provided permission for the site to be used for forest restoration purposes. I could not ascertain if this permission was written or verbal.

Subsequently, the exact 10 rais needed to be chosen and demarcated in some way. The Pong Khrai village headman took LEAF Thailand staff, FORRU representatives and the head of Pong Yang subdistrict into the field to investigate options. A sloped area next to the fire buffer road that was created about 10 years previously (mentioned above) was chosen. Photographs were taken and GPS techniques were used to demarcate the area. These GPS positions were then placed on a satellite image of the area.

Figure 4.1 shows the GPS coordinates of the AURA PES planting site and the result of the GPS demarcation of a satellite image. The star shows the location of the site at the northwest extreme of the Mae Sa watershed. Eventually, stakes were put in the ground at the site and a project sign was erected (Figure 4.2).
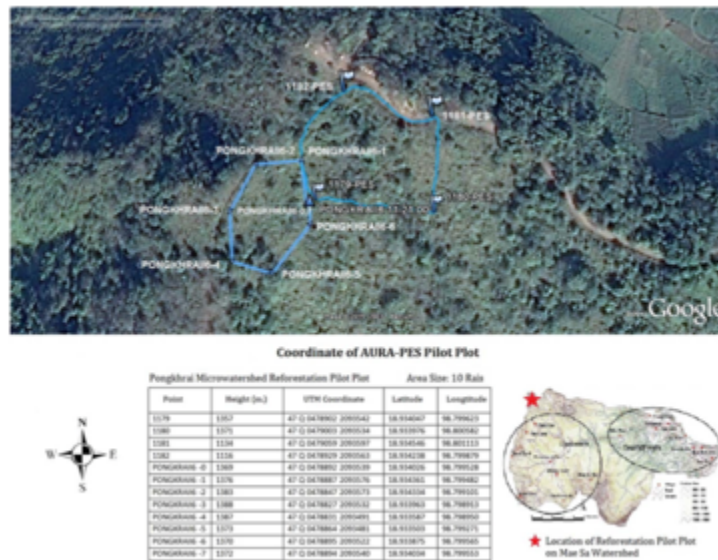


Figure 4.1 - GPS Location of the AURA PES Site
(Source: Wongsa 2015a)



Figure 4.2 – AURA PES sign at the planting site
(Source: LEAF Staff)

**4.1.2 Development of Budget and Schedule of Activities**

During early implementation, LEAF Thailand realized that many participants preferred field demonstrations and training to classroom lectures. Consequently, they tried to balance theoretical lectures with field-based activities. The first of three FORRU trainings, which LEAF Thailand facilitated and funded focused on rapid site survey techniques, site preparation and tree planting techniques. Between 20 and 25 people attended this first training including LEAF Thailand staff, Aura Company representatives, FORRU staff, a subdistrict administrative official, the Pong Khrai village headman, his assistant, and members of the village committee who volunteered to attend. Residents from two other nearby villages who had expressed interest in forest restoration efforts to LEAF Thailand staff previously also participated.

The AURA PES forest restoration site near Pong Khrai village was used as a demonstration site for the first training. During the site survey, it was estimated that 1,660 native trees already existed at the planting site (Wongsa 2015b). With a goal of attaining a tree density of 500 trees per rai, it was determined that 3,340 additional trees would need to be planted (ibid). The training participants also weeded at the site to start to prepare for the planting day.



Figure 4.3 - Pre-existing trees surveyed during first FORRU training.
(Source: LEAF Thailand Staff)

That evening FORRU staff estimated how many additional trees would be needed and the cost of each activity associated with the forest restoration effort. The following day the stakeholders that were present went through the draft budget line by line. Everyone had an opinion about the line items. They debated the price of a bamboo pole or a liter of petrol. In this way, the budget creation was a transparent process in that all stakeholders could participate in the process. In this process, Pong Khrai chose to forgo labor costs rather than choosing a smaller area to restore.

LEAF Thailand reported that perceptions of social status and lack of negotiating experience were challenges in the agreement negotiating process. They were aware of these challenges and played a crucial role, along with FORRU, in overcoming these limitations. They did this by including both Aura Company and Pong Khrai village participants in all stages of the project development and step by step walking them through the development of the AURA PES mechanisms so that the process was transparent.

Table 4.1 was created by FORRU and outlines the AURA PES budget by line item and activity. Two-thirds of the AURA PES budget was spent on two items: seedling trees at 53,440 Baht (~$1,780 USD) and fertilizer at 78,320 Baht (~$2,600 USD). An additional 24% supported a total of 161 days of labor at 300 baht per day (~$10 USD) totaling 48,312 Baht (~$1610 USD). Of the remaining 10 percent of the budget, half was spent on vehicle rentals and gas to get to the forest restoration site, and the remaining five percent was spent on miscellaneous items such as planting supplies, weed killer, and food and drinks supplied for the Planting Day. It was decided to include herbicide in the budget to control reoccurring weeds because it was significantly less labor intensive, and also limited the amount of erosion caused by weed root removal. The AURA PES funds averaged 20,000 THB per rai (~$667 USD per rai) or 40 THB per tree (~$1.33 USD per tree) (Wongsa 2015b).

**Table 4.1 Cost Estimation for AURA PES Forest Restoration Site**

| | Amount | Units | Unit Cost (THB) | Cost (THB) Year 1 | Cost (THB) Year 2 | Total Cost (THB) |
|---|---|---|---|---|---|---|
| **Pre-planting site survey** | | | | | | **0** |
| Vehicle hire | 0 | VEHICLE | 1,800 | 0 | 0 | 0 |
| Fuel | 0 | KM | 10 | 0 | 0 | 0 |
| Equipment | 0 | SET | 500 | 0 | 0 | 0 |
| Project management staff inputs - supervision data analysis | 0 | DAYS WORK | 818 | 0 | 0 | 0 |
| **Site preparation – weeding/spraying** | | | | | | **22,690** |
| Weed slashing labor | 40 | DAYS WORK | 300 | 12,000 | 0 | 12,000 |
| Herbicide spraying labor | 12 | DAYS WORK | 300 | 3,600 | 0 | 3,600 |
| Glyphosate | 5 | GALLON | 550 | 2,750 | 0 | 2,750 |
| Supervision weeding/spraying vehicle hire | 2 | VEHICLES | 300 | 600 | 0 | 600 |
| Supervision weeding/spraying vehicle fuel | 4 | KM | 30 | 240 | 0 | 240 |
| Project management staff inputs - training, supervision, payments, accounting. | 0 | DAYS WORK | 818 | 0 | 0 | 0 |
| Seedling transfer to site - labor | 0 | DAYS WORK | 300 | 0 | 0 | 0 |
| Seedling transfer to site - pickup truck hire | 7 | TRIP | 500 | 3,500 | 0 | 3,500 |
| Seedling transfer to site - pickup truck fuel | 0 | KM | 10 | 0 | 0 | 0 |
| **Tree Planting** | | | | | | **73,506** |
| Planting stock | 3,340 | TREE | 16 | 53,440 | 0 | 53,440 |
| Staking, hole digging, planting, fertilizer application and garbage clearance - Labour | 5 | DAYS WORK | 300 | 1,500 | 0 | 1,500 |
| Organic Fertilizer | 10.0 | SACK (50 KG) | 1,100 | 11,000 | 0 | 11,000 |
| Buckets & cups for fertilizer, gloves and box cutters | 1 | SET | 66 | 66 | 0 | 66 |
| Baskets | 0 | BASKET | 80 | 0 | 0 | 0 |
| Bamboo poles | 5,000 | POLE | 0.5 | 2,500 | 0 | 2,500 |
| Hoes | 0 | HOE | 150 | 0 | 0 | 0 |

**Table 4.1: (continued)**

| Description | Qty | Unit | | | | |
|---|---|---|---|---|---|---|
| Food and drink for planters | 100 | PERSON | 50 | 5,000 | 0 | 5,000 |
| Vehicle hire for project staff, VIP's etc. - planting event | 0 | VEHICLE | 1,800 | 0 | 0 | 0 |
| Fuel for transportation of project staff VIP's etc. to planting event. | 0 | KM | 0 | 0 | 0 | 0 |
| Project management staff inputs - training, supervision, payments, accounting. | 0 | DAYS WORK | 818 | 0 | 0 | 0 |
| Ceremonial items, e.g. banner, gifts, T-shirts, sound equipment etc. | 0 | MISC. | 150 | 0 | 0 | 0 |
| **Plot maintenance for 2 years** | | | | | | **103,804** |
| Tree maintenance - weeding and fertilizer application, to both planted trees and natural regenerants - LABOUR | 17 | DAYS WORK | 300 | 15,300 | 15,912 | 31,212 |
| Fertilizer | 10.0 | SACK (50 KG) | 1,100 | 33,000 | 34,320 | 67,320 |
| Supervision weeding/fertilizer application vehicle hire | 1 | VEHICLE | 1,600 | 1,600 | 0 | 1,600 |
| Supervision weeding/fertilizer application vehicle fuel | 20 | KM | 30 | 1,800 | 1,872 | 3,672 |
| Project management staff inputs - training, supervision, payments, accounting. | 0 | DAYS WORK | 818 | 0 | 0 | 0 |
| **Seedling monitoring for 2 years** | | | | | | **0** |
| Labor | 0 | DAYS WORK | 300 | 0 | 0 | 0 |
| Supervision monitoring - vehicle hire | 0 | VEHICLE DAY | 1,800 | 0 | 0 | 0 |
| Supervision weeding/fertilizer application - vehicle fuel | 0 | KM | 10 | 0 | 0 | 0 |
| Project management staff inputs - training, supervision, payments, accounting. | 0 | DAYS WORK | 818 | 0 | 0 | 0 |
| Equipment and materials | 0 | SET | 500 | 0 | 0 | 0 |
| **Fire prevention program for a year** | 0 | MISC. | | 0 | 0 | 0 |
| **FENCING** | 0 | MISC. | | 0 | 0 | 0 |
| | | **Total** | | 147,896 | 52,104 | 200,000 |

(Source: Wongsa 2015a: 25-26)

Once the budget was established, FORRU produced a timeline of activities in accordance with the framework species method of forest restoration and in alignment with the limitations of the budget. Table 4.2 outlines in detail the schedule for the activities, the reporting and the payments associated with AURA PES, starting with May 2015 as month 1. This table was created by Wongsa (2015b) to summarize the plan FORRU developed at the training using the framework species method. Fourteen distinct activities were required of Pong Khrai participants, as the sole service provider, in order to receive a total of seven payments totaling the 200,000 THB (approximately $6,060 USD), budgeted by the Aura Company, as the sole buyer. Almost half of this total was earned in the first two months, mainly for the purchase of tree seedlings, fertilizer and supplies associated with the Planting Day.

Table 4.2 also shows that during the first two years of growth the tree seedlings require a lot of attention to ensure that they will survive, especially during the rainy season when weeding needs to be intensive. Just following the Planting Day, three separate rounds of weeding and fertilization were scheduled in the rainy months of August, September and October. These activities were to be outlined in second self-report by Pong Khrai which was scheduled for December of 2015, six months after project commencement. In the later part of the first year of the project, fire monitoring and fire prevention were scheduled for several months (at the beginning of 2016). This is an important activity in a season and a region prone to wildfires. A third and final self-report was scheduled for December of 2016, after three more rounds of weeding and fertilizing had been completed in the rainy months of the second year of the project.

Table 4.2: Schedule of Activities, Reporting and Payments

1st Month = May 2015

| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Activities** | Rapid site survey & planting planning, 9-10 May 2015 | I | | | | | | | | | | | | | | | | | | | | | | | |
| | Weeding, 13 May 2015 | I | | | | | | | | | | | | | | | | | | | | | | | |
| | Spraying, 27 May 2015 | I | | | | | | | | | | | | | | | | | | | | | | | |
| | Training on planting technique, 17-18 June 2015 | | I | | | | | | | | | | | | | | | | | | | | | | |
| | Site preparation for kick-off and planting days, 19-20 June 2015 | | I | | | | | | | | | | | | | | | | | | | | | | |
| | AURA-PES Kick-off day, 19 June 2015 | | I | | | | | | | | | | | | | | | | | | | | | | |
| | Planting day, 21 June 2015 | | I | | | | | | | | | | | | | | | | | | | | | | |
| | Weeding & fertilizing, August 2015 | | | | I | | | | | | | | | | | | | | | | | | | | |
| | Weeding & fertilizing, Sept 2015 | | | | | I | | | | | | | | | | | | | | | | | | | |
| | Weeding & fertilizing, Nov 2015 | | | | | | | I | | | | | | | | | | | | | | | | | |
| | Forest fire monitoring and prevention, Jan – April 2016 | | | | | | | | | ←→ | | | | | | | | | | | | | | | |
| | Weeding & fertilizing, August 2016 | | | | | | | | | | | | | | | | I | | | | | | | | |
| | Weeding & fertilizing, Sept 2016 | | | | | | | | | | | | | | | | | I | | | | | | | |
| | Weeding & fertilizing, Nov 2016 | | | | | | | | | | | | | | | | | | | I | | | | | |
| **Report** | 1st Self-reporting, 3 July 2015 | | | X | | | | | | | | | | | | | | | | | | | | | |
| | 2nd Self-reporting, December 2015 | | | | | | | | X | | | | | | | | | | | | | | | | |
| | 3rd Self-reporting, December 2016 | | | | | | | | | | | | | | | | | | | | X | | | | |
| **Payment** | 1st Payment: THB 12,000 | O | | | | | | | | | | | | | | | | | | | | | | | |
| | 2nd Payment: THB 7,190 | O | | | | | | | | | | | | | | | | | | | | | | | |
| | 3rd Payment: THB 76,940 | | O | | | | | | | | | | | | | | | | | | | | | | |
| | 4th Payment: THB 34,800 | | | | O | | | | | | | | | | | | | | | | | | | | |
| | 5th Payment: THB 20,000 | | | | | | | | O | | | | | | | | | | | | | | | | |
| | 6th Payment: THB 36,192 | | | | | | | | | | | | | | | | O | | | | | | | | |
| | 7th Payment: THB 12,878 | | | | | | | | | | | | | | | | | | | | O | | | | |

(Source: Wongsa 2015a: 35)

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The second training focused on post-planting treatments such as techniques for monitoring survival and growth rates of the trees in order to identify any potential problems, and to evaluate their level of success for self-reports in accordance with the AURA PES agreement. FORRU reference standards were introduced as a means of self-evaluation and to be able to quantify that completed activities met some standard. These monitoring techniques were essential to the AURA PES agreement as they allowed for the formal evaluation and reporting of progress in terms of tree growth and survival rates. Other indicators such as the number of trees planted or number of hours worked would not have been accurate indicators of the level of progress towards reaching the agreement goals of successful forest restoration. In a phone interview, FORRU-CMU Co-Director (May 16, 2017) explained that Pong Khrai participants used tape measures to survey a sample of the trees with the guidance of FORRU who would calculate and analyze the information. This also helps FORRU collect research date to improve their training and implementation methods in the future.

The third training focused on nursery techniques including seed collection, treatment and propagation. This training was the result of Pong Khrai village participants expressed interest in producing the tree seedlings by themselves in order to expand the site in the future. It is not clear at this time if this has taken place.

### 4.1.3 AURA PES Committee and Payment Mechanism

The involvement, understanding, and commitment of all the stakeholders was important to LEAF Thailand staff because they were aware that they would finish their participation in AURA PES at the end of 2015. They wanted to ensure that good communication and rapport was solidly established between the various stakeholders so that the project would continue smoothly and be successful in their absence. The Aura Company required a transparent payment process and therefore was in favor of

a committee to mediate between the Aura Company and the Pong Khrai village participants.

There is also potential for criticism, disagreement and conflict between the government and communities when it comes to land use and forestry projects, particularly in northern Thailand. The Chief of Party at LEAF explained that for this reason, it was clear to LEAF that the concept of PES would need to be adapted to the local context in Thailand. It was clear that a shared agreement would have to include all stakeholders, including government representatives and a strong local private sector entity. This thinking was the driving force for the AURA PES committee formation.

LEAF Thailand staff created a working group to oversee the development and implementation of AURA PES. LEAF Thailand worked to involve all of the potential stakeholders including the RFD, the DNP, the Royal Project, the head of Pong Yang subdistrict administrative organization, FORRU, leaders at the Aura Company and the participants from Pong Khrai. An AURA PES Committee composed of nine members whom LEAF Thailand identified as key stakeholders was formed to ensure the success of the project and to increase the chances that it might be replicated in following years. Relationships among the diverse stakeholders became more formalized when a committee called AURA PES Committee was officially formed through oral commitments to oversee AURA PES on May 19th, 2015.

The AURA PES Committee members:
"1) Chief Executive of Pong Yang Subdistrict Administrative Organization, Pong
    Yang Subdistrict, District of Mae Rim, Province of Chiang Mai;
2) Headman of Pong Yang Subdistrict, District of Mae Rim, Province of Chiang Mai;

3) Head of Mae Sa Watershed Management Unit, Protected Area Regional Office 16 Chiang Mai, Department of National Parks, Wildlife, and Plant Conservation, Ministry of Natural Resources and Environment;

4)  a Representative from Forest Resource Management Office 1 Chiang Mai, Royal Forest Department, Ministry of Natural Resources and Environment;

5) a Representative from The Forest Restoration Research Unit (FORRU-CMU), Faculty of Science, Chiang Mai University;

6) a Representative from Nong Hoi Royal Project of the Royal Project Foundation, Mae Ram Subdistrict, District of Mae Rim, Province of Chiang Mai;

7) the General Manager, Aura bottled mineral water plant, Tipco Foods PCL;

8) the Headman of Pong Khrai community, Village 5, Pong Yang Subdistrict, Mae Rim, Chiang Mai; and

9) Representative from Pong Khrai community, Village 5, Pong Yang Subdistrict, Mae Rim, Chiang Mai" (Wongsa 2015a: 21).

The roles and responsibilities of the AURA PES Committee were established and agreed to before AURA PES officially began in June 2015. The committee met to draft the payment mechanism. It is unclear what role each member played but it is believed that this process was led by LEAF Thailand. Members were also tasked with resolving any conflicts or difficulties that might arise during the agreement. By the end of the two-year pilot phase, the AURA PES Committee was responsible for developing a future plan for the continuation of AURA PES.  This committee allowed village representatives, a private business, local administrative and environmental governmental officials and local forest scholars to discuss and negotiate an ecosystem service exchange with the benefit of LEAF Thailand as a third-party facilitator.

In order to receive payment for ecosystem services rendered the Pong Khrai participants provided the AURA PES Committee with a self-report outlining

activities it has completed with corresponding date and budget. After each activity in the plan was completed, the AURA PES Committee met to verify that the target activities had been completed to reference standards, and if so they signed and submitted the documentation to the Aura Company. The Aura Company had 30 days to make payment and provide proof of payment to the AURA PES Committee. The Pong Khrai participants were then responsible for providing proof of receipt to both the Aura Company and the AURA PES Committee to verify that the payment was made.  If at any point an activity was not completed, or payment was not made, it was the responsibility of the AURA PES Committee to resolve the issue by extending the timeframes or negotiating partial payment. If a payment was not made within 90 days of request, the project would be considered cancelled. It is unclear if or to what extent this framework was followed. AURA PES did not encounter any challenges in completing tasks or transferring payments so the system that was set-up to respond to potential problems was never tested. Figure 4.4 illustrates the AURA PES mechanism for the payment of ecosystem services.
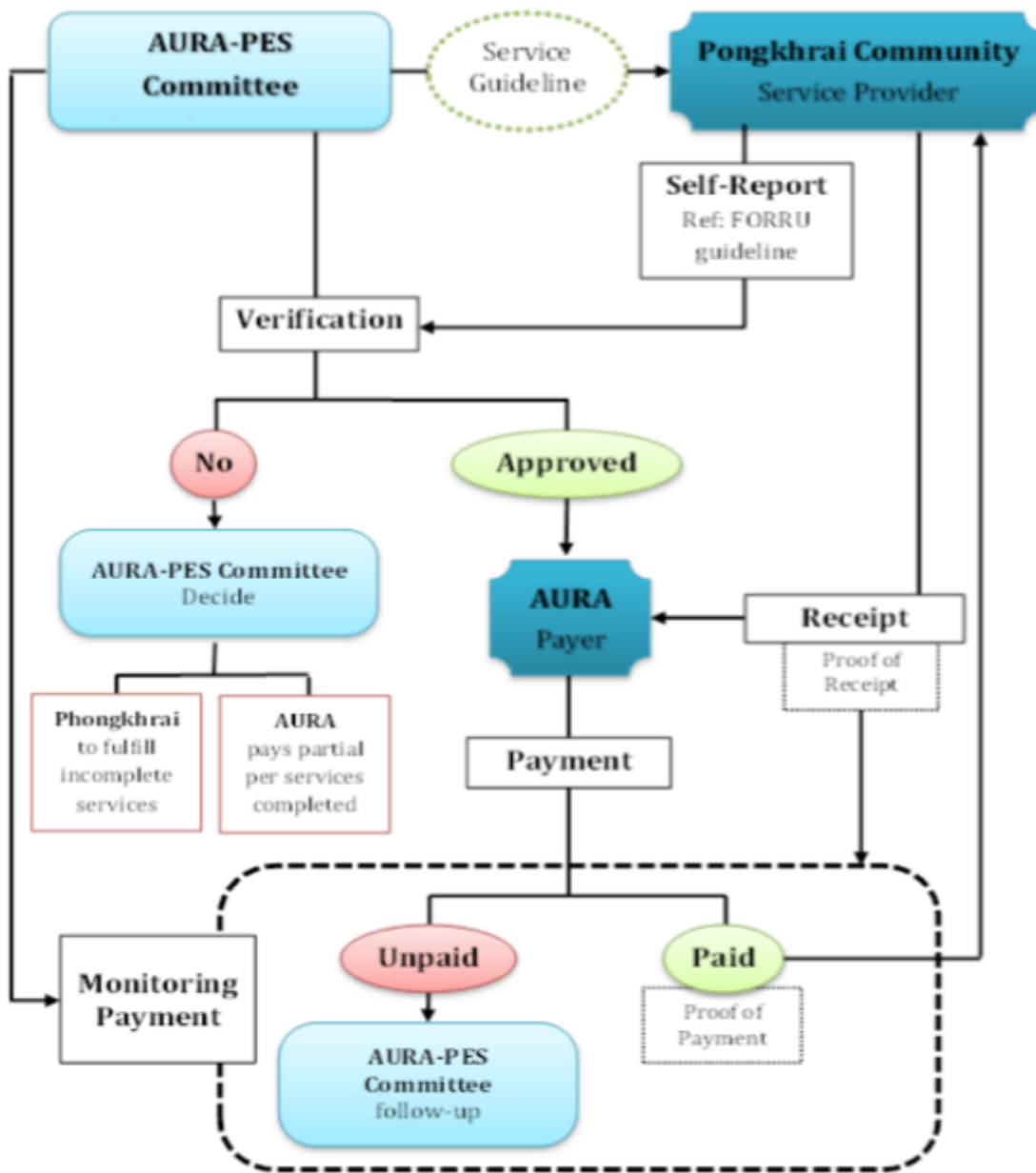
Figure 4.4: AURA PES Payment Mechanism
(Source: Wongsa, 2015a: 30)

### 4.1.4 Official Kick Off Event and Planting Day

The official Kick Off Celebration Day for AURA PES was June 19, 2015. The AURA PES agreement was publicly signed by key stakeholders including Pong Khrai village headman, the head of subdistrict administrative organization, and a representative from TIPCO Food (Aura Company). The photos taken by LEAF Thailand staff presented on the following pages show the various stakeholders and activities of the Kick Off Event and Planting Day that were the official start of AURA PES.



Figure 4.5 - Public signing of the AURA PES agreement.
(Source: LEAF Thailand Staff)



Figure 4.6 - Signed AURA PES Agreement (Source: LEAF Thailand Staff)

Approximately 300 people attended the event. Representatives from DNP Protected Area Regional Office 16 Chiang Mai, RFD, the Sub-District Authority, LEAF Regional and the U.S. Consulate were in attendance, along with many local people, teachers, school groups, Chiang Mai University students and representatives from the media.



Figure 4.7 - Presence of local authorities at the AURA PES Kick Off Event
(Source: LEAF Thailand staff)



Figure 4.8 - School groups and participants at the AURA PES Kick Off Event
(Source: LEAF Thailand staff)

Two days later, on June 21, 2015, the official Planting Day took place. Aura Company employees, Pong Khrai residents and various officials helped plant approximately 3,340 tree seedlings of 26 different native species. These efforts would bring the total tree count for the 10 rais plot up to 5,000 trees.



Figure 4.9 - AURA PES Planting Day activities
(Source: LEAF Thailand Staff)



Figure 4.10 - Markers for various tree species
(Source: LEAF Thailand staff)

### 4.1.5 New Forest Restoration Practices

The framework species method originated in Australia. It differs from other local forest restoration methods which plant trees well, but then do not follow up with care, and therefore the survival rate is often low. Local methods also generally plant rows of only one species instead of multiple species, which can regenerate habitat. FORRU advocates for the planting of 20-30 different native species to kick start recovery of a more natural looking forest habitat instead of economic tree plantations. Both 'pioneer' tree species and shade tolerant late succession species are planted in a single step, thereby leap-frogging natural forest succession (Elliott et al 2013). In four or five years, these species produce fruits or flowers that attract birds and other animals, which in turn bring in seeds from nearby remnant forest and deposit them at the site (ibid). FORRU research has shown that a site, originally planted with 29 tree species, may accumulate more than 70 incoming, recruit tree seedling species in 8-9 years (ibid). A thick forest can be witnessed at about nine years (ibid).

The FORRU-CMU Co-Director explained (May 16, 2017) that the framework species method is considered intensive for the first two years, but after that the trees are self-sustaining in their growth though still at risk from wildfires. FORRU has conducted extensive research on the methods optimal for success. They found that in the past, people planted too few trees, too far apart, so that the tree crowns would take many years to coalesce into a forest canopy necessitating prolonged (and expensive) weeding over many years. It is important to select the right type of trees and they must be weeded and have fertilizer applied 3 times in the first and 3 times in the second rainy seasons after planting. In field trials FORRU found that weeding twice per rainy season was not enough to prevent the weeds reclaiming the site, and weeding four times was a waste of money. The optimum size of tree seedlings is 30 to 50 centimeters tall. If they are smaller, weeds can overtake them, and if they are larger, they may suffer from root shock when transplanted.

It is important to explain here that the labor demands of AURA PES are very intense. On first impression, I thought that 10 rais was a very small area of land to reforest. This was before the incredible amount of time and labor required to weed a sloped plot of land this size, and protect it from wildfires, was fully understood. The labor that was required to weed the planting site is a good example.

To weed 10 rais of land to restored forest is a very labor-intensive activity. Announcements were made over the village loudspeaker system asking for one volunteer per household. Those who own land or houses in Pong Khrai, but are not full time residents, were also contacted and asked to send a laborer to support the villages efforts. During one site visit, the author discovered approximately 100 people volunteering a day of their time to help weed the site. The hope was to be able to complete the activity in one day, but the weeds were dense, and the labor demanding. In the end, it took two full days to weed the 10 rais planting site with approximately 100 people each day. This describes the effort required for just one round, of the total of six rounds of weeding required by the FORRU method used in the AURA PES agreement. The village headman explained that when people volunteered their time they could receive a meal and money for the gas required to transport people and supplies to and from the site.

The labor demands of effective fire protection for the planting site are also sizable. In late February, Pong Khrai residents organized to start clearing the fire buffer zone of the last years' growth. In March and April, they took motorbikes around to monitor for fire with a shifting guard of six people. If there are signs of fire nearby, then fire prevention measures become more intense and more people get involved for greater lengths of time. Twenty handheld radios are distributed

throughout the village to communicate urgent matters. They maintain this system of monitoring and communication until the rains begin, usually in mid to late April.


Figure 4.11 – Clearing the AURA PES site
(Source: FORRU staff)


Figure 4.12 – Weeding the AURA PES site
(Source: FORRU staff)

Figure 4.13 – Six months of tree growth
(Source: FORRU staff)



Figure 4.14 – 18 months of tree growth
(Source: FORRU staff)

Figure 4.15 –Before planting and after two years of growth
(Source: FORRU staff)

## 4.2 Initial Reactions to AURA PES

Once AURA PES was working many people wanted to come and visit a successful demonstration site. LEAF Thailand was keen to showcase AURA PES by hosting PES study tours for LEAF stakeholders in other countries including two groups from Vietnam in November and December of 2015. I attended one of these study trips to the Aura Company bottling plant and the forest restoration site with a group of about 15 participants on December 2, 2015. One member of the study group mentioned that the mechanism of AURA PES would not be possible in their context in Vietnam because their project focused on planting larger numbers of one species of tree over much larger areas in tree plantations. FORRU's approach is uncommon in the region. In addition to the concept of PES, many people are interested in visiting AURA PES to learn more about the framework species method.

Figure 4.16 - LEAF participants from Vietnam on a study trip to the AURA PES site

Pong Khrai village informants consistently cited water quantity and quality as the main ecosystem service that forests provide them. There are a lot of water issues throughout the entire Mae Sa watershed involving both water use and water quality. There is a lot of competition between the communities and the private sector, and many stakeholders would like a participatory water use management plan to be developed, especially to alleviate conflict and competition in the dry season. Awareness about competition for water in the region, along with memories of past wildfires and times when water was lacking, influenced Pong Khrai's motivation to participate in AURA PES.

When asked about the benefits of AURA PES for Pong Khrai village residents LEAF Thailand PES Project Officer responded,

> "They are happy to see the degraded area has been restored. They have
> a good impression about the private sector because the money to support them
> is coming directly from Aura Company. We provided the assistance by

inviting FORRU to support them technically with new forest restoration techniques and they learn a lot from this."

Several Pong Khrai informants expressed that there is a lot more land that they would like to restore but that this requires a huge amount of effort. They hoped that the forest around the village would be restored through their efforts though they were not sure how long it would take. One informant was excited to see tree species returning that had not been seen in a long time and believed that they were gradually making progress in "making the forest as a forest, not a forest that is all weeds." Though the initial two-year period required intense care he commented hopefully that if the trees can make it through the first two years after transplanting they are likely to survive.

Some AURA PES committee members in Pong Khrai village felt that if the planting site continued to grow successfully that they might have a study center where students and staff could come learn their methods. It could also be a site for ecotourism as the fire buffer zone along the AURA PES site is cleared of vegetation along a mountain ridge for about 9 kilometers and could be a potential hiking route for ecotourism.

## 4.3 Project Replication and the Role of FORRU in AURA PES2

LEAF Thailand met their goal to successfully foster a small-scale pilot PES project in the Mae Sa watershed as a 'proof of concept' that could serve as a learning opportunity for future projects. LEAF Thailand staff considers the AURA PES mechanism to be a very clear and an easy-to-understand and follow agreement. After the LEAF Thailand program closed at the end of 2015, AURA PES transferred to the Chief of the Mae Sa Watershed Unit at the DNP. All of the AURA PES ecosystem service restoration activities were subsequently completed, and all payments were successfully transferred from Aura Company to the participants in Pong Khrai village.

LEAF Thailand staff anticipated that because the stakeholders were all local people or local organizations, and that they were all involved in the entire process, they would be able to continue or even expand the project after LEAF Thailand's role was complete. The LEAF Thailand PES Project Officer stated, "I think our plantation site will do well as long as the village headman stays involved. A lot depends on the leaders of both sides; the Aura Company and also the sub-district." LEAF Thailand staff reflected that the AURA PES Committee acts like a collaborative body and the project would benefit from their very strong relationships.

While the agreement for the pilot project was for two years, Aura Company suggested if the project was implemented successfully it might continue to fund the project for 10 consecutive years. In 2016, AURA PES stakeholders were able to negotiate the replication of the AURA PES agreement for a second iteration (AURA PES2). This second agreement was initiated and signed by the AURA PES Committee without the assistance of LEAF Thailand. The length of the research period allowed me to follow AURA PES2 into the first year of the second phase of implementation, which began during the second year of the initial two-year pilot project.

As had been hoped for, and intentionally designed for, AURA PES was indeed replicated with the same conditions for a second round. The FORRU-CMU Co-Director explained in a phone interview (May 16, 2017) that it is often difficult for tree conservation funders to find communities to participate in their activities due to disputes between communities and lack of clarity about how land can be allocated. Once a successful project is identified, other organizations often try to piggyback on this success. In this case, PUR Project, a French social business that promotes livelihoods and regenerates ecosystems, offered to sponsor an additional 10 rais (1.6 hectares) of land (Elliot et al. 2017).

In May 2016, the Aura Company CSR manager said that they would like to expand up to 200-300 rais and had allocated 400,000 THB for the next two years. In 2016, together with PUR, they started another round of payments to Pong Khrai participants who agreed to the immense amount of volunteer labor involved in weeding, planting, monitoring and protecting 20 rais (3.2 hectares) of trees. The RFD approved a second plot of land that was 20 more rais (3.2 hectares), double the size of the original agreement, for reforestation efforts. The same technologies were used to expand and demarcate a planting site near the first.



Figure 4.17 – AURA PES2 tree planting
(Source: FORRU staff)

Since the original planting site still needed to be maintained for a second year, this meant Pong Khrai village participants were responsible for 30 rais of restoration activities during the second year of the pilot project's implementation. This proved to be too much of a demand on the available volunteer labor (Elliot et al 2017). Despite meetings coordinated by FORRU to strongly encourage stakeholders to continue the annual plantings, no trees were planted in 2017 as a part of an expanded AURA PES agreements.

The FORRU-CMU Co-Director concluded that rather than lack of interest, the AURA PES project became too popular, too quickly and expanded beyond the capacity of the village to maintain. It might have been better to deter the second funder and keep the project expanding at a regular interval. In his experience, it was more difficult to restart restoration activities once they had stopped. If there is a regular annual budget allocation by the funder and an annual planting event with associated attention to the site then momentum was more likely to continue. It is unclear at the time of research completion if any form of AURA PES3 will take place in 2018.

## 4.4 Summary

This chapter provided an overview of the AURA PES mechanism including the project budget, timeline of activities, mechanism for payments and the roles and responsibilities of the AURA PES Committee. These mechanisms, and the stakeholders who agreed to them, would not have come together without the assistance of the non-state facilitator, Lowering Emissions in Asia's Forests (LEAF Thailand), and the expertise of the Forest Restoration Research Unit (FORRU) from Chiang Mai University. New expertise included; methods of land demarcation through GPS, new methods of forest restoration, new PES practices of economic exchange that support this goal, and new actors that are willing and authorized by the state to participate in managing land they claim to protect.

Chapter 5 examines the research findings and results beginning with a summary of the operational practices and practices of AURA PES. The investigation of historic beliefs or practices in Pong Khrai village that was presented in chapter 3 allows the new expertise that have been adopted and gained legitimacy among the various project stakeholders and any new territorial dynamics that emerged from exposure to the project to be identified. The theoretical discussion examines how the concept of PES is adapted in the field. The research comes to a close with policy implications and recommendation for further research.

# CHAPTER 5

## Conclusions and Theoretical Discussion

As of December 2017, all of the provisions of the AURA PES agreement had been fulfilled, and all payments were made in full. By collaborating in a new agreements of watershed forest management, AURA PES stakeholders realized the goal of keeping trees seedlings alive to restore watershed forest land. The project had also been replicated (AURA PES2), at double the scale, during the second year. The intention to continue replicating the agreement encountered challenges as the project grew. It is unclear at this time if a version of AURA PES3 will take place in 2018.

As a result of PES projects new webs of conservation partnerships are being created. At times the role of national governments is increased in the name of global initiatives. At times, local peoples' claims to conserving and maintaining a livelihood from forests can be further marginalized as the concept of conservation through exclusion of people has expanded. Corporate buyers, transnational environmental groups and foreign governments all try to exert influence in their hope to promote what they deem to be appropriate conservation measures.

From the assessment of project documents and government reports along with formal interviews and informal conversations the AURA PES buyer and service providers, local forestry experts, third party mediators and their supervising non-governmental organization,

this chapter will discuss the research findings and results in regards to the research questions. The theoretical discussion focuses on how the theory of payment for ecosystem service differs from the practices in the field. Policy recommendations and further research recommendations are provided.

## 5.1 Research Results and Findings

### 5.1.1 Operational Process and Motivations for Participation

Many articles have been published on the theory and program design of payment for ecosystem services (PES). "Despite considerable interest in the use of PES worldwide, however, few PES mechanisms have been carefully documented" (Engel et al. 2008: 664). One of the aims of this research was to examine, analyze and understand the operational process of a small-scale payment for ecosystem service project that was initiated by a non-state actor in northern Thailand and to examine what both state agencies and local stakeholders hoped to gain from participating.

In a multiyear project, LEAF Thailand worked in collaboration with the Thai DNP to create a PES pilot project between Aura Company (beneficiary/buyer) and participating residents of the Pong Khrai village (service provider) located in the Mae Sa watershed and within the MAB Reserve. With no prior experience participating in a PES project and no examples in Chiang Mai province to learn from, both the Aura Company and Pong Khrai were unlikely to have been able to negotiate a PES project on their own. While the AURA PES agreements are straightforward and clearly documented, the process that was required in order to develop them was lengthy and complex. It required considerable time, motivation and financing from an outside intermediary.

LEAF Thailand collaborated with Thailand's DNP in a pre-implementation process in order for a PES project to be negotiated. The DNP asked LEAF Thailand

to help facilitate the development and approval of a comprehensive management plan for the Mae Sa-Kog Ma MAB Reserve. During this process, LEAF Thailand collected data about land tenure in the region and reviewed policies related to payment for ecosystem services. They gathered and analyzed data from both beneficiaries/buyers and service providers in order to identify potential types of ecosystem service activities and create a public awareness campaign (Soonthornnawaphat and Vaidhayakarn 2014). In order to raise awareness about the concept of payment for ecosystem services, they facilitated and funded PES study trips to Vietnam and Laos, as well as initiating many informal discussions about the concept. LEAF staff also visited other organizations to see the scope of their work and the challenges they were facing. Through a lengthy process of inquiry, they were eventually able to gain the commitment of the Aura Company and Pong Khrai village in the soon-to-be-named AURA PES project.

In order to navigate a successful PES project, LEAF Thailand staff included all potential stakeholders in the operational process. This included the engagement of the RFD, the Thai DNP, the Royal Project, the Head of Pong Yang Subdistrict Administrative Organization, in addition to stakeholders from Aura Company, Pong Khrai village and FORRU. The DNP gave its support and guidance for the project and the RFD gave permission for land under their jurisdiction to be allocated for the purposes of the project. LEAF Thailand also facilitated the formation of an AURA PES Committee to oversee the implementation of the project and resolve any potential conflicts.

The head of the subdistrict authority in Pong Yang played a key role in building trust between the various stakeholders. The LEAF Thailand also organized and funded trainings by a local forestry research center from Chiang Mai University, FORRU, for participants in Pong Khrai village. A PES agreement was successfully

negotiated and then implemented from June of 2015 to June of 2017. LEAF Thailand organized and partially funded large Kick Off and Planting Day Events including the public signing of the AURA PES agreement and the planting of over 3,300 tree seedlings. LEAF Thailand staff saw themselves as mediators that brought together important stakeholders and made things happen.

AURA PES would not have been possible without the funds provided by Aura Company, the new expertise and practices provided by FORRU, and the self-motivation of Pong Khrai that mobilized the large amount of volunteer labor that was needed. Additionally, LEAF Thailand played a pivotal role in enrolling the stakeholders and establishing a committee that could oversee the project. LEAF Thailand and FORRU were also essential in providing new expertise in the negotiation of a PES agreement. The nexus of local residents, business, state sub-district and environmental authorities, non-state experts and third-party intermediaries that negotiated AURA PES came together to create a novel mechanism of environmental decision making. Each of these actors brought to the table their own practices, interests and goals. Figure 5.1 summarizes the motivations and benefits of AURA PES stakeholders.

Figure 5.1 – Summary of stakeholders' motivations and benefits
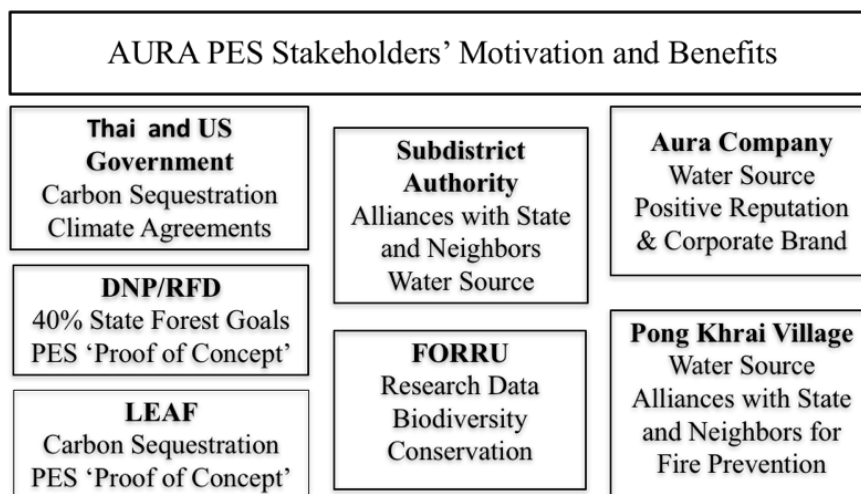
### 5.1.2 New Expertise Resulting from AURA PES

The research found that two new expertises and associated practices were adopted and gained legitimacy among local AURA PES stakeholders. Discussed first, is how new forest restoration techniques were promoted and what tree survival rates resulted. Secondly, the adoption of expertise that are required to negotiate and replicate a PES project are explored.

During the research, I met people who had participated in trees ordination practices in order to protect trees. Many stakeholders had participated in tree planting events, sometimes in honor of the King and Queen or for making merit. Rarely did anyone mention follow up care for the trees. Several of these tree planting efforts were reported to have low survival rates. Both the Aura Company and Pong Khrai village participants had attempted tree plantings multiple times in the past. Both stakeholders reported that they had limited success in terms of tree survival rates. The three FORRU trainings allowed stakeholders to gain new forest restoration expertise. These new practices were essential to the survival rate of the planted trees. They also could be applied to other projects in the future without further assistance.



Figure 5.2 – FORRU training lecture
(Source: FORRU staff)

Figure 5.3 – FORRU field training
(Source: FORRU staff)

The Pong Khrai village headman described that residents already knew how to plant trees, however, as they worked side by side with FORRU staff, they learned important details about forest restoration methods. For example, they learned about the correct time of year to plant different species. FORRU recommended that they clear the land of weeds before planting, which they had not done in the past. FORRU also encouraged them to use fertilizer. Previously they had let the seedlings grow naturally because they did not have a budget for fertilizer and the area of planting was too large to be supported by homemade fertilize. Additionally, Pong Khrai village participants learned to use an herbicide (single application only) before tree planting. FORRU selected a non-residual and non-accumulative herbicide with very low toxicity to animals as an alternative to clearing the site with hand tools, which would cause a lot of soil erosion on such a steep site. All of these new practices were promoted during training sessions and reinforced in practice at the AURA PES planting site.

The new expertise introduced by FORRU during AURA PES resulted in an unusually high survival rate of 80% (Elliott et al. 2017). The FORRU-CMU Co-Director explained that generally tree survival rates could be expected to be between 70-75%. They had never previously seen tree survival rates maintained above 80% over two years. This high success rate can be attributed to the new expertise gained by stakeholders from FORRU's long experience of scientifically testing restoration and training techniques, in addition to the diligent hard work of the Pong Khrai village participants. While AURA PES was replicable it is not clear at this time if its expansion will be sustainable beyond the second implementation.

The residents of Pong Khrai did not exhibit the same reversal of attitudes and actions towards the environment in response to a PES project as the residents of Kumaon, India, did to the British administration of forests in Agrawal's research. Instead, they took a step from protecting forest to restoring forest. They did this through workshops that promoted new practices of forest restoration (site surveys, site preparation, species selection, planting planning, financial planning, forest monitoring and maintenance) and putting new knowledge into practice about the importance of weeding, fertilizer and the time of year when trees are planted.

In addition to new forest restoration expertise, AURA PES stakeholders also gained new expertise in the process of negotiating a PES project. Aura Company may have been unaware of the concept of PES before it was introduced by LEAF Thailand staff but the possibility that intact forests could generate income is not completely new to Pong Khrai village residents. The FORRU-CMU Co-Director (May 16, 2017) explained that in some ways Pong Khrai had a previous experience that primed them for being able to understand and adopt the PES concept to their own situation. Resident families in the village had received a small annual amount of money from a local zip-line tourist company call 'Flying Squirrel' which rents land to operate in

Pong Khrai (Elliot et al. 2017). This money is meant to encourage them not to disturb the forests where the zip-line company operates. Therefore, they may have been predisposed to being able to conceptualize receiving monetary payment in relation to forests. LEAF Thailand may have been able to capitalize on these previous experiences in their efforts to build new ways of thinking about economic exchanges in the realm of ecosystem services and watershed forest management.

The DNP was aware of the concept of PES previous to their interactions with LEAF Thailand; however, there were no functioning PES projects in the region prior to AURA PES. LEAF Thailand and FORRU played pivotal roles as third-party facilitators that walked stakeholders step-by-step through the process that was required to negotiate from concept all the way through to the actual planting of tree seedlings in order that they could apply the new expertise in the future. Members of the DNP (and to a smaller extent RFD) who participated in AURA PES Committee meetings, attended events or read the various reports and media coverage that were produced about the project, would also have gained new understanding and expertise of how the PES mechanism could work and the realities of a functioning PES pilot project in the field. The feedback at lessons-learned sessions showed that though DNP representatives questioned whether AURA PES was a 'true' PES project, they thought that the project was a success, and that they hoped that it could be adapted at a larger scale throughout the Mae Sa watershed (communication with LEAF Thailand staff, Dec 2017).

Bernstein and Cashore (2007: 5) ask how non-state market driven governance achieves 'political legitimacy', "defined as the acceptance of shared rule by a community as appropriate and justified". They suggest that a learning process that encourages the exchange of information, development of best practices, and allows stakeholders to build a mutual understanding of legitimacy, is beneficial when trying

to establish political legitimacy for non-state market-driven governance (Bernstein and Cashore 2007). LEAF agreed that "strengthening capacities for more concrete knowledge, understanding and confidence in payment of ecosystem services … [is also believed to] enhance the project's success" (2012: 3).

> Agrawal did not make "the common presumption that actions follow beliefs. [He's suggesting instead] that people often first come to act in response to what they see as compulsion or in their short-term interest and only later develop beliefs that defend short-term actions on other grounds as well" (2005: 166).

Agrawal (2005) makes an argument that through direct participation in environmental practices such as monitoring or enforcement, individuals may feel more personally connected to the impacts of actions towards the environment and thus develop environmental subjectivities through practice. Another way to say this is that while some people may protect the environment because for them "the environment constitutes a critical domain of thought and action" (Agrawal 2005: 16), for others it is through the practice of monitoring or protecting the environment that they come to care about it in a certain way. Agrawal (2005) viewed practice as the critical link between power and belief. In this way, he is able to make the link between politics, institutional rules and environmental subject formation that is co-produced and interrelated rather than cause-and-effect.

To some extent this would be true of all of the stakeholders that participated in the operational process of AURA PES, which required many meeting, trainings, and events. It would also apply to the large number of additional people that attended the Kick Off and Planting Day Events. Participating in the process, the practices, the media and the events of AURA PES in turn came to influence existing

environmentalities. The implied impact is that cumulatively, the effect of AURA PES could have deepened the formation of a certain environmental subjectivities in the greater Mae Sa watershed, far beyond the forest restoration site. It is possible AURA PES will help set the stage for more, similar projects in the future. New potential PES stakeholders who witnessed, attended or even learned about AURA PES events might be more capable of conceptualizing a working PES project of their own.

PES projects are now playing a part in restructuring existing governmental regulations, producing new practices and environmentalities. "Policies aiming at greater decentralization and participation are about new technologies of government. To be successful, they must redefine political relations, reconfigure institutional arrangements, and transform environmental subjectivities" (Agrawal 2005: 7). Similarly, but different from the British Administration's shifting relationship to local forest governance described by Agrawal (2005), we see evidence in this research of another step away from the environmentality of centralized management towards local management in which local residents come to be allies in the goal of forest conservation, but there are challenges with the dynamics of this process. These will be examined in the next section.

### 5.1.3 Shifts in Local Territorial Perceptions

In reducing the environment to measurable biological systems the "logics of sovereignty, imposing military-administrative jurisdiction over bits and pieces of these global systems in irrationally drawn territories through governmentality, must be supplanted by larger logics of environmentality" (Luke 1995: 78)

Agrawal explained that "the emergence of environmental subjects in Kumaon, India, involved complex interactions between the way local residents have understood

their relationship with the forest and the contexts within which their understandings have become possible" (2005: 202). The land designated for forest restoration activities in AURA PES is nested within a web of local, state, and MAB reserve territorial claims. This research looked at the ways that non-state intermediaries navigated in this complex territorial landscape and in which ways AURA PES potentially altered this web particularly in the context of local territorial conflicts.

In Thailand, there is not currently a supportive legal framework for either communal or individual rights to forest resource management and the state is considered the main authority in land recognized as official conservation zones (Neef and Thomas 2009). The lack of legal framework and land title documentation that would support the rights of local people in managing resources was a challenge that LEAF Thailand had to overcome in order to implement AURA PES (USAID LEAF 2012). Due to the limited local land rights and land titles, PES projects have had to overcome fears for example that planted trees will later be claimed by the government. AURA PES may have been hindered by the lack of clarity in this system while simultaneously acting as a bridge that might foster a more effective means of collaboration between state agencies and local residents.

Even at its small scale, the project required a process of renegotiating state territoriality in order for land to be set aside for the operation of the project. The methods of the AURA PES project required spatial classification of a territory (10 rais), as opposed to relying on the number of trees planted or number of hours worked. The GPS techniques and satellite imagery used in AURA PES are a new form of legal or classified territoriality. These GPS positioning practices reinforced the demarcation of the village land border with new technologies that went beyond those of their map-making predecessors and the previous practice of demarking the border with a firebreak road. These new practices leave less room for interpretation.

In the larger context of limited land titles, increasing populations, and growing demands for land, clearly defined land borders are becoming more important in this area. Around the turn of the century, as land pressures intensified in rural areas of northern Thailand, the newly formed Northern Farmer Network (later the Northern Farmer Federation) began advocating for community land titles (CLT) to prevent communities from losing the land that they depended on for their livelihoods to outsiders by granting rights for land to be managed collectively (Wittayapak and Baird 2017).

The state does not have the resources to manage or conserve forests alone and both Hayami (1997) and Ganjanapan (1998, 2003) argued for multiplicity in classification and conceptualization when it comes to including local participation in the management of forest conservation. Vandergeest (1996) argued that the government should enable innovative solutions that recognize property rights for local user groups. In personal communication with Wittayapak (March 12, 2014) he described concerns that because privatization increases competition it could erode collective benefits of cooperation.

Despite promising momentum in 2010, the goals of CLT have not been realized. The legacy of the community forest movement is that the Thai state became more conciliatory towards community movements and made room from new approaches (personal communication with Vandergeest, July 14, 2017). In an attempt to accelerate sustainable forms of development, the Thai constitution of 1997 gave local communities the right to manage natural resources and participate in their development. "It is believed that rural communities, by applying their indigenous knowledge, can use forest resources sustainably and promote appropriate forest conservation" (Office of Environmental Policy and Planning 2000: 53).

Under the current military government which took control in 2014, there are hopes to both reforest large areas of land and to allocate degraded forest lands to farmers that already occupy it. The current military government has countered the idea of CLT with the Kor Thor Chor (KTC) program (Wittayapak and Baird 2018). Importantly, the KTC program differs from the original CLT intentions in that it excludes areas classified as 'protected' or as 'watershed 1 or 2' and instead of acknowledging community ownership of land that are included in the program it only allows for 30-year leases (ibid). While enrolling in the KTC program can improve rights of access and remove fear of violating state laws it is double-edged in that enrollment clearly indicates a surrender of sovereignty and acceptance that the government owns the land.

AURA PES engaged local participants in work that might be considered that of the RFD and DNP. There is no land title to the AURA PES site and as class 1 (erosion-prone) watershed forest land it is not eligible for community land titling in the KTC program (Wittayapak and Baird 2018). Even though FORRU staff discouraged Pong Khrai from volunteering their labor, Pong Khrai residents chose to forgo labor costs rather than choosing a smaller area to restore. They had other reason that motivated them to participate (mentioned previously in section 5.1.1).

Similar to the case study in Kumaon, India, where "instead of local populations losing control over their resources as a result of central state policies, they can now be seen as recuperating at least part of that lost control" (Agrawal 1994: 202), residents of Pong Khrai could be seen as reaffirming precarious land rights, or 'quasi' rights (Wittayapak and Baird 2017), but the area was not declared a community forest and there was no change of ownership. In Lebel and Daniel's (2009) review of ecosystem services in tropical upland watersheds he concluded that while multi-stakeholder planning improves effectiveness of policies, the importance

of power relations still remains, and pre-existing institutions will impact who will 'win' and 'lose' with new regulations. AURA PES may have simultaneously increased Pong Khrai's claims to legitimacy as a land user and manager, while also reinforcing the government's claim of ownership.

In territorial areas where activities compete for locations it can be informative to ask 'why one site over another?' or 'why one activity over another?' (Sacks 1986). Agrawal wrote "new environmental subject positions emerge as a result of involvement in struggles over resources and in relation to new institutions and changing calculations of self-interest and notions of self" (2005: 3). One staff at LEAF Thailand believed that Pong Khrai would like to make peace with its neighbors and build trust with both local and state officials in its aims to build alliances to protect the head of their watershed from wildfires (Dec. 22, 2017).

These goals may have been partially in reaction to a past territorial dispute with a neighboring village. Most AURA PES stakeholders interviewed for this research did not make any associations between the history of territorial conflict between Pong Khrai and Nong Hoi village and the current use of this land for forest restoration efforts; however, the author believes it is likely that a historic territorial conflict played some role in the way AURA PES was accepted.

Figure 5.4 - Location of planting site in relation to Pong Khrai and Nong Hoi
(Source: www.maps.google.com)

Figure 5.4 shows that the AURA PES planting site is much closer to Nong Hoi village than to Pong Khrai village. This location required extra effort by the participants of Pong Khrai to access for project activities, as opposed to a site located closer to the village. As previously mentioned, this location is also on the border established between the two villages approximately two decades earlier and is at the head of the Pong Khrai subwatershed.

A possible negative outcome that resulted from AURA PES is that from the perspective of the Nong Hoi residents, AURA PES most likely decreased the legitimacy of any future claim that they might have to use this land, for agricultural activities or otherwise. While Pong Khrai does not have the manpower to pursue land intensive agriculture in this area, Nong Hoi does. It is hypothesized that the residents

of Pong Khrai village viewed the AURA PES forest restoration efforts as a form of insurance policy to ensure that past forest encroachment by a neighboring village, that they feel threatens their water supply, would not happen again in the future. It was an opportunity to build trust and alliances with both local and state officials and with neighboring villages.

## 5.2 Theoretical Discussion and Knowledge Contribution
### Payment for Ecosystem Service – Theory versus Practice

"Nature must be reduced through the encirclement of space and matter by national as well as global economies to a cybernetic system of biophysical systems that can be dismantled, redesigned, and assembled anew to produce 'resources' efficiently and in adequate amount when and where needed in the modern market place" (Luke 1995: 70)

Global ecological changes have inspired new forms of environmental knowledge and new economic policy tools to promote forest conservation and restoration. Latin America was a pioneer for implementing PES programs. A comprehensive study of 40 operating PES programs in Latin America showed that the theories that support certain core PES principles are often mismatched with their practice (service-action conditionality, service definition and payment negotiation) (Martin-Ortega et al. 2013). This section attempts to show that the theory of how payment for ecosystem services projects will work differed in several ways from the realities of AURA PES in the field.

### 5.2.1 Ecosystem Services are Bundled and Complex

The assumption that a clearly defined ecosystem service can be bought and sold is not clear in AURA PES, as payments were directed towards the production costs of the project rather than the value of any ecosystem service specifically. In a 2011 study the Northern Development Foundation argued that shifting cultivation

farms have a high capacity to sequester carbon because new growth requires more carbon than a standing forest. "Shifting cultivation farms, including active and rehabilitating farms aged 1 to 10 years, have actually stored 17,643 tons of $CO_2$ while burning produced only about 476 tons of carbon" (Northern Development Foundation 2011: 21). In this case, shifting agricultural practices may be more effective at sequestering carbon that forest restoration efforts!

> "The worldwide evidence that high hills and mountains usually have more rainfall and more natural forests than do adjacent lowlands has historically led to confusion of cause and effect. Although the physical explanations have been known for more than 50 years, the idea that forests cause or attract rainfall has persisted" (Pereira 1998 cited in Forsyth 2003: 34).

Both Aura Company representatives and Pong Khrai residents strongly link the area of watershed forests where AURA PES is located to the health of their water supply. Wildfires and the water supply were of concern to many I spoke with. In the two years of this research the region went through a year of significant drought followed by a voluminous rainy season that caused flooding and the collapse of small bridges and impacted agricultural activities. The Pong Khrai village headman believes that Aura Company receives direct benefit from AURA PES in terms of the water they consume, which results from their forest restoration efforts. The head of CSR at Aura Company (May 13, 2016) stated that AURA PES is in Aura Company's own interest because water comes from a good forest.

The locally held belief that links watershed forest to increases in the water supply has been critiqued by scientific research, yet, this locally held belief is the basis on which AURA PES is considered a PES project instead of another form of

economic exchange. Without this link, it is difficult to make the case that AURA PES is tangibly linked to the valuation of a particular ecosystem service. Winrock International was aware of these criticisms; however, the USAID grant that supported Winrock International's implementation of the LEAF Initiative required that the funds be used for activities that directly reduce emissions. From their perspective, AURA PES forest restoration efforts were more strongly linked to goals of increased carbon sequestration than any changes in the local water supply. Figure 5.5 shows how the AURA PES ecosystem services are pictorially displayed in a LEAF report (LEAF n.d.).



Figure 5.5 - Infographic of AURA PES ecosystem services

Work in Madagascar suggests that by bundling different ecosystem services, for example carbon sequestration with water services and biodiversity conservation, conservationists can create new funding for more cost-effective conservation (Wendland et al. 2009). In the case of AURA PES, water related ecosystem services important to Pong Khrai, Aura Company and local authorities were bundled with carbon sequestration services valuable to LEAF, the US and Thai governments.

All of these bundled ecosystem services were coupled with: the aims of the DNP and RFD to encourage more community involvement in its goals to maintain 40% of national land as forest, LEAF and DNP's goals of implementing a PES 'proof of concept', and Pong Khrai's goals to build local and state alliances in managing a watershed forest area in a region prone to wildfire. "PES policies thus take on multiple

meanings and enroll other actors through the porousness of the concept; not everyone has to agree completely on what PES actually is" (McElwee 2006: 181). While each stakeholder pursued their own individual goals, the bundling of ecosystem services allowed this vision of joint interest to be developed and ultimately foster forest restoration.

## 5.2.2 Limited Influence and Availability of Economic Incentives

The second assumption intrinsic to the concept of PES is that it works like a market mechanism in that ecosystem services will be bought and sold and that people will participate due to expectation of economic gain. Ecosystem services are interconnected and nearly impossible to separate in order to value and sell (Hecken and Bastiaensen 2010). LEAF Thailand staff suggested that the DNP does have a method for valuing carbon sequestration capabilities of forests; however, in AURA PES no direct link was made to either the actual value of the water or the actual value of the carbon sequestration. No connection is made between the size of the reward and the value of the service. Instead of directly buying ecosystem services the AURA PES stakeholders chose to focus on supporting the activities necessary to maintain or enhance them.

Ideally, ecosystem service providers would be able to determine prices and practices, but the in the field reality is that the demand side of the market is rarely self-motivating and therefore, third party actors often negotiate prices, practices and payments (Hecken and Bastiaensen 2010). In the case of AURA PES, the service provider (Pong Khrai) did not offer their ecosystem restoration services for sale on a market. Instead the process worked in reverse and the desires and the budget of the buyer/beneficiary (Aura Company, and in some ways LEAF) drove the process of monetary exchange. Aura Company offered a set amount of money, and the practices

that were feasible with the sum they offered were negotiated among the stakeholders, with the assistance of LEAF Thailand and FORRU.

There is also an assumption with forest restoration PES projects that people will plant trees because they are paid to. Engel et al. (2008) argue that in order for payment for ecosystem service projects to be successful they must provide financial incentives that benefit individuals at a level that exceeds the profits that they would have made through alternative uses of the land. Though it might be argued that Pong Khrai did not have plans to financial profit from this land in other ways, it is useful to remember that they could have profited from using their time and labor for alternative profit making activities.

Pong Khrai participants chose not to gain economically from the enormous amount of labor that was required in order for AURA PES to be successful. However, they also did not believe that their forest restoration efforts would have been possible without the funds from Aura Company (as well as the funds necessary to support FORRU trainings). Much of the AURA PES budget went to support the purchase of appropriate seedlings, fertilizer, and other supplies. The small amount of money allotted for labor was used more as a reward than as an incentive. It was used for gas, snacks and on occasion a small payment to encourage the enormous amount of volunteer labor that was required to complete the requirements of the project.

Despite the PES assumption that monetary rewards will motivate PES service providers to maintain or restore an ecosystem service, this does not hold true for AURA PES. Members of FORRU and LEAF Thailand that attended the FORRU budget development training confirmed that Pong Khrai residents chose to forgo labor costs rather than choosing a smaller area to restore. In addition to the limitations resulting from the current context of 'legal plurality' of northern Thailand's land

tenure systems (Ganjanapan 2003), Pong Khrai's participation in AURA PES was more motivated by social incentives than the economic incentives proposed by the PES concept.

**5.3 Policy Implications**

Since AURA PES was still in its pilot phase, a comprehensive assessment of the impacts of policy implementation would be premature. Aware of the limits of analysis, the author concentrated on local perceptions and the implementation of a PES scheme on the ground. However, the development of global climate agreements is likely to increase PES or similar types of projects in the future. With this in mind, some preliminary policy recommendations are offered here.

One thing that strikes the author is the narrative that AURA PES was a small project, with a small budget, and minimal funds for actual labor costs. This may be true at the local level, but it hides the vast resources that were spent at the regional level of LEAF in order to get the project started. LEAF's budget was $20 million USD over a five-year period. Due to the integrated approach LEAF took to its work and the cross-country nature of many of its training programs, it was not possible for Winrock International to estimate how much of the total budget was spent directly on developing AURA PES.

This is not to imply that any money was misspent, but rather to point out that enormous resources were required to get the AURA PES pilot project off the ground and running. In this context, the amount of money provided to Pong Khrai for the actual labor involved in forest restoration activities was insignificant. It would be useful if AURA PES inspired other businesses to become more willing to contribute funds to these types of projects. However, if service providers/sellers are genuinely going to be compensated for their efforts, it is recommended that alternative streams of funding be investigated at the local level.

If international donors have the intention that service providers should be paid for their labor they might consider budgeting in a way that allows them to 'match' or 'multiply' funds generated locally. This would not only help better compensate local service providers/sellers but possibly encourage beneficiary/buyer participation as well. However, it is important to point out that the introduction of real financial incentives, rather than social incentives, is likely to have unexpected consequences that are not present in development and implementation of AURA PES.

Secondly, Thailand has many minority ethnic groups with varying levels of inclusion or exclusion from Thai society and civic rights. This research illustrated that PES projects involving land management necessitate territorial authority and can interact with both state and local perceptions of land authority. It is recommended that programs that design PES projects in Thailand carefully consider their impacts on minority populations and are cautious of the possibility that marginalized people could be distressed, displaced or contained in the pursuit of PES goals.

Finally, for those aiming to implement PES projects in northern Thailand, it is recommended that future PES projects consider replicating the aspects of the AURA PES process. PES project mediators would benefit from identifying stakeholders that have a pre-existing interest in the environment. Transparency, broad inclusiveness and the interest and involvement of government stakeholders were essential to building trust among the stakeholders, as were small, short-term goals. The creation of a project committee who are familiar with each other, tasked with resolving problems and capable of replicating the PES negotiation process on their own, is highly recommended if PES projects are intended to be replicable and sustainable.

**5.4 Further Research Recommendations**

While this research was successful in answering its research questions, there were directions of inquiry that could have been followed but were not. There are an incredible number of individual relationships, or nexuses of power, that could have formed in the process of operationalizing AURA PES. It was not possible within the limitations of this research to explore them all. The history of the relationship and current interactions between DNP, RFD and Pong Khrai village (or Aura Company), for example, are not well understood and may have provided useful additional information about both the local history of spatial power and transforming environmentalities. It is also unclear at the time of research completion if any form of AURA PES3 will take place in 2018. The future trajectory of renewed engagement or stalled implementation of the 10-year AURA PES vision could be a useful topic of future research (Elliot et al. 2017).

The impacts of AURA PES on the neighboring Nong Hoi village and their awareness, understandings and reactions to the project were also not investigated. The author certainly contemplated the residents of Nong Hoi, as stories about their land use practices, participation with the Royal Project, and past conflicts with residents of Pong Khrai were often mentioned during interviews with Pong Khrai residents. The author learned from the FORRU-CMU Co-Director that Nong Hoi also participated in tree planting activities. However, they were less likely to do so without monetary compensation for their labor. I wondered how their beliefs about forests were similar or differed from Pong Khrai. How did their larger population and stronger agricultural land use practices influence these beliefs? How much were they involved in ecotourism and what were their goals for land use and land use management in the future?

In the end, I decided that this research was beyond the scope of my current capabilities to complete within the time allotted, but it would be an interesting comparative study. The history of relations between these two villages does appear to have an influence on AURA

PES, particularly in regards to the location of the site that was chosen and authorized for tree planting. This site is actually much closer to Nong Hoi than to Pong Khrai, making it more challenging to access for weeding and fire protection. However, the site also corresponds directly with a village land border established between the two villages over a decade ago, which is located at the headwaters of the Pong Khrai subwatershed. More research into the knowledge and practices of Nong Hoi residents towards land use and forests would have enriched this study.

The election of President Trump in November 2016 dramatically impacted the climate change discourse being produced by the United States government. In fact, while documents produced by the United States government, were saved by the author, they are no longer accessible online. At the time of writing, the United States has indicated it plans to pull out of the Paris Climate Agreement, the Obama-era Clean Power Plan has been repealed and Bill HR 861 has been introduced in the House to terminate the Environmental Protection Agency. Suffice to say, it is unlikely that the funding that made LEAF's work possible would be allocated in the current political environment.

Thailand has also experienced significant political shifts. The military remains in power at the time of this writing. Plans for an election have been rescheduled for November 2018. The end of the 70-year reign of the beloved King Bhumibol Adulyadej came to an end on October 13, 2016. A year of national mourning came to a close with his funeral in October of 2017, and his son, King Maha Vajiralongkorn has ascended to the throne. It is unclear how these shifting political landscapes will impact the likelihood of future collaborations between these two countries. However, it is possible that the success of this project, and others like it, may positively influence the Thai state's willingness to expand these types of mechanism in the future.

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# APPENDIX A

# List of Key Informants

| Number | Status in Pong Khrai | M/F (Age) | Role in AURA PES | Location | Method of data collection |
|---|---|---|---|---|---|
| 1 | Village Headman | Male (44) | AURA PES Committee Member | Pong Khrai | in-depth interviews |
| 2 | Headman Assistant | Male (57) | AURA PES Committee Member | Pong Khrai | formal interview |
| 3 | Resident | Male (50) | AURA PES Committee Member | Pong Khrai | formal interview |
| 4 | Resident | Male (46) | AURA PES Committee Member | Pong Khrai | formal interview |
| 5 | Resident | Female (47) | Non-participant | Pong Khrai | formal interview |
| 6 | Elder Resident | Male (72) | Non-participant | Pong Khrai | in-depth life history interview |
| 7 | Elder Resident | Female (67) | Non-participant | Pong Khrai | in-depth life history interview |
| 8 | Teenage Resident | Female (16) | Non-participant | Pong Khrai | informal interview |
| 9 | Teenage Resident | Male (15) | AURA PES participant | Pong Khrai | informal interview |
| 10 | Child Resident | Male (8) | AURA PES participant | Pong Khrai | informal interview |
| 11 | Child Resident | Male (9) | AURA PES participant | Pong Khrai | informal interview |

| Number | Affiliation | Informant | Role in AURA PES | Location | Method of data collection |
|---|---|---|---|---|---|
| | AURA Company | | Buyer | | |
| 12 | Plant Manager | Mr. Attapon | PES Committee Member | Aura Company Plant | formal presentation at Aura plant |
| 13 | CSR Manager | Ms. Tantawaan | Participant | Aura Company Plant | formal interview |
| | LEAF Thailand | | AURA PES Faciltator | | |
| 14 | Project Manager | Mr. Somsak | Non-State Intermediary | Chaing Mai | in-depth interviews |
| 15 | PES Project Manager | Mr. Chawapich | Non-State Intermediary | Chaing Mai | in-depth interviews, email communication |
| 16 | Reporting Consultant | Mrs. Wongsa | Non-State Intermediary | Chaing Mai | non-formal interview |
| | FORRU-CMU | | Forest Restoration Expert | | |
| 17 | Co-Director | Mr. Elliott | PES Committee Member | Chaing Mai | In-depth interviews, email communication |
| 18 | Staff | Ms. Phutthida | AURA PES Site Trainer | AURA PES Site | informal interview |
| | Sub-District Office | | Local Authority | | |
| 19 | Head | Mr. Muangma | PES Committee Member | Aura Company Plant | formal presentation at Aura plant |
| | Winrock International | | Oversaw LEAF | | |
| 20 | Winrock International | Mr. Bean | LEAF Chief of Party | Bangkok | formal phone interview, email communication |

# CURRICULUM VITAE

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