

How do forest policies, agriculture and the temple affect livelihoods in Phra Bat Si Roi and how are they related to deagrarianization?



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DECLARATION

By signing this document, we certify that all members have reviewed and agreed that this is the final version of the study report. Moreover, we declare that the research is our own and all sources of information have been duly acknowledged.

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ABSTRACT

Introduction: The village of Phra Bat Si Roy, the object of our study is located in the Mae Lor watershed of the Chiang Mai province. Situated in forest classified for conservation, our group investigated the phenomena of deagrarianisation by analysing the effects of forest policies, agriculture and temple on local livelihoods. A combination of interviews, questionnaires, PRA's and FRA's methods were used to collect the necessary data needed to answer our research questions.

Results: Despite officially insisting on forest conservation standards, the RFD allows the villagers some autonomy to define boundaries for utility and conservation forest as local needs require. While predominantly a *miang* farming community recent years has seen diversification of livelihoods among the villagers. This is a result of several infrastructural improvements brought about by a rapidly expanding temple drawing many tourists to the area. The effects of the tourism has raised the income level sufficiently to allow the families to educate their children. Some families are receiving a chanod for their land, the rest are in the process of being part of a community land-title deed.

Conclusion: While the improved conditions for the adult villagers has enabled them to diversify their livelihoods, they are still primarily farmers. The younger generation, though, is disinclined to remain within the agrarian sector, and are sufficiently well educated to pick any non-farming vocation either in the city or in the village. Thus, Phra Bat Si Roy is now seeing a rapid deagrarianization process due to the increase in income.

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Abbreviations

- **BOD** Biochemical Oxygen Demand
- **DL** Department of Lands
- FDC Fecal Coliform Bacteria
- FRA: Forest Resource Inventory
- GPS: Global Positioning System
- PBSR: Phra Bat Si Roy
- PRA: Participatory Rural Appraisal
- **RFD:** Royal Forestry Department
- SSI: Semi Structured Interviews
- TAO: Tambon Administrative Organisation
- **TDS** Total Dissolved Solids
- NTFPs: Non Timber Forest Products
- WSC: Watershed Class

1. INTRODUCTION

Before the 1930's Thailand was a heavily forested country with an estimated forest cover of 70%, but by 2002 it was down to an estimated 13% (Delang, 2002). In 1941 the Forest Act had been passed, designating all land as 'reserved forest' unless ownership had been officially established (Kaosa-ard, 2001). This land was slowly mapped, and by 1993 45% of the land was designated as forest reserves (Delang, 2002). The obvious discrepancy between percentages of forest cover and forest reserves is due to the fact that forest reserve land does not necessarily contain forest (Figure 1.1) (Buergin, 2003). In 1985 the National Forest Policy was passed, which after the logging ban in 1989 designated 25% of the land as conservation forest and 15% as production forest (Hares, 2009). In 1992 the conservation forest came to include all existing natural forests, as well as all protected areas and watershed areas (Buergin, 2009). About 10 million people lived within the forest reserves or protected areas, and around 1/3 of Thailand's agricultural lands were within these areas (ibid).



Figure 1.1 The graph shows the almost paradoxical decline in forested areas, while the area designated as forest reserves increases. The areas designated for logging are also shown until the ban on logging in 1989. Finally, the slow increase in protected areas are shown. (Buergin, 2003)

Almost 17 million hectares of the forest reserves, which constitute 1/3 of the total designated forest reserve area, are in Northern Thailand (Sumarlan, 2004). However, the actual amount of

forest in Northern Thailand is only 7.3 million hectares, which is still more than 50% of the total amount of forest in Thailand (ibid).

The mountainous geography of Northern Thailand creates many watersheds, which, as mentioned above, are protected by law. According to Kramer *et al.* (1997) forest cover in a watershed helps regulate how quickly the water enters the streams and the total water runoff, thus being a factor in avoiding floods. Another study referenced by Kramer *et al.* (1997) predicts watershed degradation will lead to yield declines downstream, and that especially shifting cultivation will lead to huge increases in sedimentation.

Formerly nomadic hill tribes belonging to ethnic minorities reside in the mountain areas of Northern Thailand and are frequently blamed for causing deforestation as their agricultural practices previously included shifting cultivation, and also due to ethnic prejudice (Walker, 2004). However, others argue that upland locals may practice forest-friendly cultivation techniques and take a great deal of care to protect the water sources (ibid). Walker (2003) concludes that there is no clear evidence that significant reductions in forest cover reduces rainfall, and that other studies have actually found an increase in annual stream flow due to forest clearing.

A land titling project was undertaken in order to help people get legal documents to their land (Bowman, 2004). A preliminary study before the Land Titling Project was undertaken, found 46% of Thailand was agricultural land; out of this 18% was farmed by people with no land documents and 21% was actually designated forest reserve (ibid). While the Land Titling Project was successful in raising the amount of titles from 4.5 million in 1985 to 18 million in 2001 it did not include farmers on forest land (Burns, 2004). In 1982 a usufructory license became available to farmers illegally occupying forest land, however, under several conditions, most importantly that their land holdings could not exceed 2.4 ha (Hirsch, 1990). With the passing of the National Forest Policy in 1985, farmers occupying steeply sloping lands (\geq 35%) became unable to receive any kind of deed for their land, though (Hares, 2009). A regulation allowing the issuing of community land title deeds was approved by the Cabinet in 2010 (Inside Thailand, 2010), which has so far been issued to almost 200 communities (The Official Site of the Prime Minister of Thailand, 2011). It is controversial, though, as the National Parks Department finds it violates existing laws (Thailand Law Forum, 2010).

Rather than focusing on agriculture, the Thai government has emphasized industrialization (Rigg & Nattapoolwat, 2001). Partly due to this emphasis, the rural population has diversified into a broad number of activities, both on and off farm (ibid). This diversification process is known as 'deagrarianization', and is defined as 'reorientation of economic activity, occupational adjustment and spatial realignment of residence away from agrarian patterns' (Bryceson, 1996). This results in less self-sufficiency, movement of labour to the industrial sector and reduction in the size of the rural population (ibid). The diversification process is a matter of accepting income opportunities when they arise, and can be off farm employment without change of residence or (temporary) migration, where the income may return to the household as remittances (Ellis 1998). The migration rate is high in Thailand (Vanwey, 2003), with migrants constituting a large part of every aspect of the Thai economy making temporary and seasonal migration part of village life (Singhanetra-Renard, 1997)

The total population of Chiang Mai province is 1.5 million, of whom 350,000 live in or near Chiang Mai city. The rest, 1.15 million people, live in the rural areas of the province (Jones and Pardthaisong, 1999). The largest ethnic group in the province is the Khon Muang, which constitutes more than 50% of the population in the province. The Khon Muang, meaning 'People of the Principalities' are also known as Northern Thai, and as such regarded as ethnic Thais (Forbes, 2007). Like most ethnic Thais, the Khon Muang are Buddhists (Forbes, 2007) of the Theravada branch. Buddhist monks are held in high esteem, and part of being a practicing Buddhist is to make offerings to the monks and the temples. Making these offerings are known as 'making merit', a deed that is beneficial to the merit maker both in this life and future incarnations (Keyes, 1983).

The Mae Lor watershed, which was the subject of our investigations (Figure 1.2.), is home to several ethnic groups including the Karen, the Hmong and the Khon Muang. As a watershed, it is, as mentioned above, by law classified as protected forest. Land in watersheds is further classified by the Department of Land Development (DLD) with regard to physical and environmental factors, and the majority of land in Mae Lor watershed is either Watershed classification (WSC) 1A (40.6%) or WSC 2 (43.9%) (Mingtipol *et al.*, 2011). Three of the villages included in the overall study were within WSC 2, and the last was within WSC 3, which is more lenient than WSC 2.

Box 1.1: According to Tangtham (Tangtham, 1996), WSC 1A is "protected forest area and include the headwaters of rivers. The area is usually at high elevations and have very steep slopes and should remain in permanent forest cover", and WSC 2 is "commercial forest: The area is designed for protection and/or commercial forests where mining and logging will be allowed within legal boundaries, usually at high elevations with steep to very steep slopes. Landforms usually result in less erosion than WSC 1A and WSC 1B. The area may be used for grazing or crop production if accompanied by appropriate soil protection measures."



Figure 1.2. Topographic map of Mae Lor watershed (Mingtipol et al., 2011).

Our investigation focused on the village of Phra Bat Si Roy (PBSR), which is located in an altitude of 1,000 m above sea level in the Mae Lor watershed in Chiang Mai province. The surrounding land is WSC 2, however, to the north and south the land is WSC 1A within no more than a kilometer. It consists of 39 households, and the population is Khon Muang.

The main income is from miang, which is grown in orchards dating several hundred years back. With the improved infrastructure, they have been able to diversify into several other agroforestry crops, such as plum and various citrus fruits. The villagers also rely on collecting non-timber forest products (NTFPs) in the forest, which provides a good secondary income opportunity as well as food on their tables.

As Khon Muang, the villagers are devout Buddhists, and the village is physically divided by a large temple area with two temple structures, one of which houses a large monolith with the Four

Footprints of the Buddha. Buddha footprints, which can be natural formations in rock, are frequently found on mountains in Asia (Brown, 1990), and the Footprints in PBSR are regarded as very powerful, as they are said to have been made by four different incarnations of the Lord Buddha.

Due to the tradition of 'making merit' and the extraordinary nature of the Footprints, the temple receives very large sums of money and draws pilgrims from all of South East Asia. The money from merit is to some extent channelled into infrastructure, beneficial not only to the temple but also to the village, and the pilgrims spend money purchasing local products and meals from the villagers. Thus, even with a remote location, the villagers of PBSR have opportunities for diversifying their livelihoods.

1.1 Problem formulation and research questions

It is our intention to investigate how the three major factors, the forest policy, agricultural practices and the temple¹, impact livelihoods in PBSR, and how they, both alone and interacting, may affect a potential deagrarianization process in the village. This intention is summed up in our problem formulation, which we will answer through three research questions:

Problem formulation:

How do forest policies, agriculture and the temple affect livelihoods in PBSR and how are they related to deagrarianization?

Research questions:

- I. How do forest related factors impact livelihoods?
- II. How do the villagers' agricultural activities affect their livelihoods?
- III. How is the temple affecting livelihoods?

¹ Temple as used in this text refers to the 'holy footprints' of Buddha and all 'institutions and / structures' related to it

2. METHODOLOGY

In this section we will describe the methods used in the field, and discuss their pros and cons. Sections 2.2 through 2.4 will discuss how we used the methods to answer our research questions. Section 2.5 will elaborate on how we conducted the methods in the field and will include a discussion on the validity and reliability of the methods in relation to their application. Certain results found in the field are not included in the report, which either relates to the fact that the results go beyond the scope of the project, the information is nice but not important to know or we simply had to leave the data out due to word limitations. It should also be noted that the time limits of the field work period very much relates to the amounts of methods used and the elaboration of each method.

2.1 Introduction to PBSR

To gain an overview of PBSR, our object of study, we have prepared an introduction to the village which includes general information on PBSR gained from questionnaires and semistructured interviews (SSIs). We also provide a GPS map of our field and include water sampling as an indicator of living standard.

2.2 How do forest-related factors impact livelihood strategies in BPSR?

In order to discuss how the forest impacts livelihoods in PBSR, it is imperative to understand the importance and relevance of The Royal Forest Department (RFD) legislation on local forest use. It is furthermore necessary to understand the importance of the forest in relation to livelihoods of the villagers in PBSR. To relate RFD legislation to local forest management practices and the magnitude of forest use, findings from **interviews** with the RFD are included in the analysis section. The information about the villagers' understanding of RFD regulations provided by the **household questionnaires**, relate to the relevance of aforementioned regulations in terms of livelihoods, while other answers provided by the questionnaires relate to the magnitude of forest use and dependency on forest and forest products. To understand local forest provisions and to allow us to conduct a Forest resource Assessment (**FRA**), the division between utility and conservation forest is included and discussed. The RFD regulations, local forest use and local forest management is then triangulated with results on the state of the forest found through the FRA. These informations are then synthesized into how the forest-related factors impact livelihoods and how this relate to deagrarianization.

2.3 How do the villagers' agricultural activities impact their livelihoods?

In order to investigate how agricultural activities impact the villagers' livelihood strategies we undertook an investigation of their agricultural activities. In our field work we chose several methods that complement each other. To gain an overview of agricultural activities in PBSR we included questions in our **household questionnaire** relating to said activities and linked them to the **seasonal calendar**. We extracted information on income related to agriculture, whether they produced crops for commercial or subsistence purposes and if they had home gardens. Furthermore we undertook **participatory observations** and **transect walks** in three representative villagers' fields to observe the fields first hand. In order to relate agricultural activities to soil quality we conducted soil sampling. We furthermore included **interviews** to discuss the importance of these different crops and how they contribute to income. Once the magnitude and relevance of agricultural activities in PBSR were gauged, we were able to draw conclusions on the impact said activities has on the livelihoods of the villagers and how this impact affect deagrarianization.

2.4 How is the temple affecting livelihoods?

In order to understand how the livelihoods are affected by the presence of the temple, the temple's role within the village must be understood. Several methods were put to work to extract this information. The temple contributes in two primary ways. It attracts tourists and it has provided the village with basic infrastructure. To assess the effect of tourism on livelihood strategies we have included **SSI's** with the restaurant owner and market women as their income is directly linked to tourism. We have conducted a **tourist questionnaire survey** in order to understand the purpose for the tourists' visit, and what they found attractive about PBSR, to uncover the relevance of the temple. To assess the relevance and effect of the infrastructure the temple has provided the village with; we did interviews and a timeline. While the interviews provided us with information on the benefits provided to the village and villagers' progress. The community mapping with the market women also revealed the great emphasis the market women

put on the temple. With both infrastructure and tourism investigated, we were able to uncover the role they play in relation to livelihoods and deagrarianization.

2.5 Data collection methods

2.5.1 Semi-structured interview - SSI

During our field activities we employed numerous semi-structured interviews, in order to answer various research questions. Prior to each interview, a list of topics that needed answering and clarification was prepared, while the interviewer posed follow-up questions and explored additional topics. The stratification strategy for choosing informants was a combination of the information we wanted extract, the availability of people and convenience sampling. Some key informants we wished to interview were fortunately available during our stay, while other additional key informants were interviewed, because the information they possessed was deemed relevant in relation to the problem formulation. During the field work we had difficulties conducting these interviews, due to linguistic and translational barriers. Specifically, the quality of translation and linguistic differences may have corrupted our results. Hence, the data gained and presented in the report may be biased. While translation always poses difficulties in general, SSIs especially pose obstacles due to their open nature. Our initial understanding of the case, in part created bias as to which questions we emphasised and to some extent whom we chose to interview. The validity of the stratification is therefore biased.

2.5.2 Questionnaires

In order to gain an understanding of household composition in PBSR, we chose to employ household questionnaires. The purpose of which was to create statistically analyzable data, which would enable us to answer our problem formulation. We created a comprehensive questionnaire with the specific purpose of obtaining a diverse set of data, in order not to lack key information upon returning from the field. All questionnaires were translated to Thai, as we hoped the conduction would be less problematic. While this allowed our Thai counterpart to understand and conduct the questionnaires there were some translation errors. e.g. one question posed was incorrectly translated, rendering it useless for analysis. 20 household questionnaires were administered during our stay in PBSR. Our initial stratification strategy was to define major differences among the villagers (e.g. household size, income sources, and size of farmland) when

we arrived to the field, but with information provided from early interviews it became apparent that household strategies were fairly similar. As a consequence of this, and the difficulties we had finding people at home, our primary choice of sampling was based upon convenience. The households chosen were marked with GPS. To gain data related to tourist attractions in PBSR, questionnaires were administered. Specifically we were interested in uncovering the purposes of their visit, their perspective on the village and the income they provided the villagers. We conducted the tourist questionnaire throughout our stay, but the bulk of them were administered over the weekends when tourist numbers were higher. Data gathered from the 25 questionnaires will be subject to analysis in later chapters. The problem with conducting questionnaires is that defined questions do not capture real life variety and complexity. Questions posed will be subject to the poser's understanding of the field and disregard the understanding of the respondent. The quantity and stratification choice of the questionnaires will be a limiting factor, unless all possible informants provide answers.

2.5.3 Forest Resource Assessment

In order to assess the condition of the forest surrounding PBSR, we conducted an FRA. Initially the purpose of the FRA was to assess the quality of the forest in relation to RFD regulations and local forest management provisions. We chose four plots to do the assessment. We assessed the top layer of soil and depths of roots in the middle of each plot. To help in species identification a local guide joined us and provided us with the names of trees. Each FRA plot was mapped using GPS. The plots and amount of plots we chose to assess may not be representative. Hence, the results may differ from actual state of the forest. Furthermore as the differentiation between utility and conservation forest varied according to whom we asked, the results may be biased. The chosen minimum diameter of the trees (the standard measurement reference) may also impose bias on our results.

2.5.4 Soil analysis

In order to assess soil quality in PBSR we carried out soil samplings. We wanted to assess and compare soil quality in orchards, conservation and utility forest. Hence, three locations representative of the aforementioned land types were chosen. In each location we collected five samples into one composite sample, which would undergo analysis. Basic soil chemical and physical properties were chosen to be examined. The locations we collected samples from were

marked using GPS. The representativeness of the plots chosen is questionable as a larger number of locations would have given us better results. Within each location the number of samples collected and where they were collected could have given biased results.

2.5.5 Water sampling

The initial justification for conducting water samples was two-fold. The primary purpose was to estimate water quality in the temple and village reservoirs and relate the results to the forest plots done by these reservoirs. This would indicate the relationship between water quality and condition of forest. The secondary purpose was to assess the water quality immediately downstream of PBSR to see the impact the village and temple have on water quality. We have however used the samples differently as the results were inconclusive in relation to their initial designation. The samples are therefore only used to assess the general quality of water in the village. We marked the locations with GPS. The water samples collected may possibly not be representative of the general quality of water as samples do not provide a general impression. There is the possibility of an increase in bacteria levels during the transportation from the different locations to the laboratory.

2.5.6 PRA methods

2.5.6.1 Focus group discussion

The purposes of the focus group discussions were numerous. Initially we wanted to conduct the discussions with four groups; old, young, men and women, but the availability of people in the field did not allow this. While we did talk with a few people simultaneously the only discussion worthy of being called a focus group discussion was conducted with the young during the weekend where the theme of discussion was their future perspectives. The results however may be biased due to the fact that only a few of the young present, actually took part in the discussion. While some made comments on their future perspective others nodded and agreed.

2.5.6.2 Seasonal calendar

The purpose of the seasonal calendar was to uncover the seasonal availability of some agricultural crops and NTFP's collected throughout the year. The calendar would provide us with information triangulate other sources and was furthermore related to their seasonal activities, e.g. income and expenditure. This seasonal calendar was conducted with market women. The bias

related to the results of the market women's perspective leaves a hole in relation to what other perspectives exist. Results may have been different had we included the perspectives of other groups.

2.5.6.3 Timeline

The purpose of the timeline was to uncover major changes in the village. In order to access the information necessary to do so, we tried to gather the oldest people in PBSR. The outcome was a short discussion with three people who described the major changes that had affected them. Before we could complete the timeline, our respondents had to leave. The limitations of people participating in the timeline may have corrupted the precision of the results. The precision is furthermore corrupted by things they forgot, and the fact that they only told us of the changes they found relevant. The abrupt ending of the exercise imposed limitations on our results.

2.5.6.4 Community mapping

In order to understand what the inhabitants of PBSR regarded as important in the village, we conducted community mapping. Initially our stratification was based upon four groups, but the difficulties in gathering all groups did not allow this. We conducted two community maps, one with the market women and one with the young. The one conducted with the young was very comprehensive and allowed us to triangulate the household mappings with the results of our GPS mapping. The result of both maps will be included in later chapters. The market women and the young may have a different understanding of what a map entails. The instructions for how to create the map and what it should include may also have been translated differently to each group. Similarly the understanding of the instructions provided may have varied in relation to their understanding of a map.

2.5.6.5 NTFP ranking exercise

In order to understand the role NTFPs have in the livelihoods of the villagers, we did a ranking exercise. As we knew that numerous NTFPs are collected, we wanted to investigate which were most profitable. An NTFP ranking exercise was therefore conducted with eight market women to determine which of the seven most popular NTFPs were the most profitable. Results from the exercise were then used to discuss the contribution of NTFP collection to household incomes and subsequently the importance of the local market.

2.5.6.6 Transect walks

In order to gain an overview of the community and its resources we did two transect walks, to see and describe the distribution of the main natural resources, land use systems, landscape and other things of importance. GPS tools were also employed to mark significant observations along the transect. Furthermore information provided by the transect walks was used to select appropriate sites for collecting soil samples and also enabled us in identifying potential sites for the FRA. The bias related to this activity, is related to the fact that it relies solely on the perspective provided by our guides. The reliability of the information provided is therefore questionable.

2.5.6.7 Participatory observation

To see what the farmers are growing in their orchard fields and home gardens, a participatory observation method was applied. Together with the farmers, their agricultural fields were closely investigated and explained each activity in detail. The fields were mapped with GPS. A problem presented by the fact that we only included the agricultural fields and garden of three households limits the results in terms of representativeness.

3. RESULTS AND DISCUSSIONS

3.1 Introduction to the village

PBSR is located on the upper zone of the Mae Lor Watershed. People living in the village are mainly Khon Muang. However, in the past also Hmong people used to live in this village but they were relocated in 1970's (Ajan Somporn, March 5th, 2011, pers.comm). The whole area of the village covers 4015 rai: 60.06% conservation forest, 21.05% utility forest and 18.89% for land use (Mingtipol *et al.*, 2011). PBSR was originally part of another village, Muang Ga, until the dirt road was constructed in 1969/70.

Originally, the village was established in the 1940's by 16 households who came from Nong Kay and San Pa Yang villages in Mae Taeng district (Mingtipol *et al.*, 2011). Until the road was made, many people made seasonal migrations to their miang files in the area. They would live up to 30 people together in big bamboo huts in the jungle for a month, and then return to the their village farther away. After the dirt road was constructed more people settled. At present there are 39 households and the population of the village is over 100 people. We asked the elders to make a time line in order to get an overview of the major historical events (Table 3.1.1).

	Timeline
1969	Ban Phrabat Si Roy became its own village
1969/70	Dirt road was established
1989	Primary school in the village was closed; the kids now live with relatives in villages with schools
1989	More tourists started arriving to the village
1990	Concrete road was established
1993	The old temple was renovated
1997	Newly constructed temple
1997	Migration of young people

Table 3.1.1 Timeline made by elders

2000	Market was established
2003	Parking around the temple
2010	Dam was expanded and new road to the reservoir was build
2010	TV show about the temple

It was since 1969/70 with the construction of the dirt road that PBSR started undergoing change. Once the road was made the villagers got easier access to the markets outside the village where they could sell their agricultural products. The main income in the village traditionally comes from miang (a kind of tea). However, within the last years the demand for miang has been declining, so people try to introduce new crops such as coffee or bamboo. They are also engaged in production of winter crops e.g. phlap and buoy, for which the market price is high.

In 1990 the remote village became further accessible due to the concrete road sponsored by the temple. Even though the new road is difficult to navigate during the rainy season the tourists are pouring into PBSR and an increasing number of visitors within the next years is expected. The tourist questionnaires (Figure 3.1.1) revealed that people come to the village mainly for religious reasons to worship the Footprints with great devotion and to see the newly built temple. However, the surrounding nature also plays an important role in completing the tourists' spiritual experience, and villagers actively participate in forest protection to make sure that the forest appears pristine and attractive.



Figure 3.1.1 Purpose for visit

The temple plays a crucial role in village life. This is because the temple not only functions as a place of prayer and worship but also as the main centre and initiator of village activities. The temple is strongly associated with village development. Moreover, the four footprints of the Buddha serve as a spiritual center for lay Buddhists, and give the village women opportunity to sell flowers and leaf gold to the worshipped. The development of the temple has created more income opportunities for the women, as very few used to work with anything but collecting miang leaves. People are no longer only collecting NTFPs (e.g. cinnamon, honey, herbs) solely for their own consumption but also for sale at the market by the temple (Figure 3.1.2).



Figure 3.1.2 GPS Community map

Further village development might be strongly limited by the lack of electricity. As we learned from the interview with Tambon Official getting electricity to the village requires cutting down about 18 rai of forest which the RFD is not willing to grant the permit for. The alternative of underground cables is expensive (6 million Bahts of which the temple has provided 1 million). The budget has however been sent to the central government and is still awaiting approval for funding

In November and December 2010 the temple reservoir was expanded, a new dam and better road to the water source was constructed. As we learned from the interview with Uncle Sa-Ngad, former Head of the Temple Management Group, the village committee is currently working to expand the village reservoir. The work is planned to start in April 2011 and take half a year. This project will be supported financially by the government.

The condition of the water from both water reservoirs in the village is very good in biological, chemical and physical aspects [Table 3.1.2]. The water reservoir provide many benefits such as clean water for household consumption and as a rain water reservoir.

Table 3.1.2 Results of the water sampling collected the last day of field work and analyzed by the University of Chiang Mai Laboratory. Surface water quality standards were given by the Laboratory.

	Position				Standard quality		
Parameters	1. River of the village reservoir	2. River before the first home of the village	3. River of the temple reservoir	4.Temple reservoir	5. River after the last home of the village	for surface water (Agricultural propose)	Analysis method
1. Turbidity	2.03	11.20	8.40	15.40	100.80	Drinking water 5- 15 SSU (NTU)	APHA-AWWA (1998)
2. TDS	80.07	150.00	98.96	144.00	290.00	n 100-500 mg/l	
3. pH	9.40	9.52	9.35	9.17	9.25	≤ 2.0 mg/l	pH meter
4. BOD	1.80	3.80	2.70	1.80	2.80	≤ 4.0 mg/l	APHA-AWWA
5. DO	6.20	7.80	6.20	6.70	7.20	5 – 7 mg/l	(1998)
6. FCB	3.80	13.80	3.80	3.80	28.80	≤ 4,000 MPN/100ml	
7. Nitrate	7.23	2.45	2.57	10.80	4.54	≤ 5.0 mg/l	AOAC (2000)
8. Phosphate	0.46	1.29	1.21	3.34	1.98	≤0.03 mg/l	

3.1.1 Land tenure

The average agricultural land holding in PBSR is 16 rai per household. There are only three families in the community, who do not own their own land; they work as labourers harvesting miang for others. The villagers mostly do not have any land documents. Household surveys revealed that only 5% of the villagers have Chanod ,which is a true land ownership title deed (Figure 3.1.3). Nevertheless, everybody feel very secure in the ownership of their land. This security lies in tradition. All land in the village is inherited and people have been living there since it was part of the Kingdom of Lanna.





On 11 May 2010 a regulation on the issuing of community land title deeds was passed by the Cabinet (Inside Thailand, 2010). The essence of this regulation is to legally allow both highland and lowland people to collectively manage and use state-owned land for their living. The community land-title deed is just a licence to identify the community's right to use the land. This is not an official right granted to the community, that they have permanent ownership of the land. Currently, PBSR is on the process issuing tenure. However, as we learned from questionnaires only 25% of the respondents have documents for their land and will receive Chanod (Figure 3.1.4), while 70% is expecting to be included in the community land-title deed, which the community is in the process of applying for.

During the interview with the Department of Land (DOL) it was explained that in accordance with the law people cannot get ownership for their land within conservation forest. However,

PBSR is a big exception because it includes a temple area, so people can get tenure even though it is conservation forest. According to the interview with the RFD, villagers are also allowed to have their village and utility forest within conservation forest because they had settled there before the conservation forest was established.



Figure 3.1.4 Land in PBSR on the process issuing tenure [Source DOL, Thailand]

3.1.2 Migration

The quality of life has improved as the temple has developed. Household surveys, semi structured interviews and informal talks reveal that the economic development has allowed people to send their children to school and college outside PBSR. This has also been facilitated by the change in birth rate as the families have no more than one or two children. The village used to have its own primary school, however it was closed in 1989, back before the concrete road was constructed. After the closure of the school children are sent to school in other villages or Chiang Mai, where they live with relatives. Even though that kids are not living in PBSR they still spend their holidays and weekends in the village.

During a focus group discussion with nine children all except one of them agreed that they prefer living in PBSR. However, all the children are uncertain whether they will come back to live in the village after graduation, as most of them are not yet sure, what they will be doing in the future. Their parents let them choose what they want to do, but the kids all have the same opinion that they want a good education. While none of them want to receive an agricultural education or become farmers, they recognize the income opportunities the temple provides the village, and they see themselves opening shops, restaurants and guest houses in PBSR instead of working in a field. However, they do not see other options for their parents, at the moment, than selling things at the market and collecting *miang*.

As we learned through various interviews and informal talks the young people who have graduated have good jobs in the city and may not come back. A reason why the younger generation is not yet returning to the village may be found in the age structure of the village. 95% of the questionnaire respondents were between 41 and 60 years old. This means that their kids were either still in school or just starting to explore the world outside PBSR, which all parents encouraged their children to do before deciding whether to come back or not. Also, only two respondents received any remittances, and these remittances did not provide any significant contribution to their economy.

However, the village can provide good income opportunities even compared to the big city. In an interview with the headman, he explained that the starting wage for an office job in Chiang Mai is about 6,500-7,000 Baht/month, while people can make more than 10,000 Baht/month in PBSR,

and even more once the number of tourists increases. However, lack of electricity and phone coverage as well as an inferior infrastructure all contribute in making the village a less desirable place to live.

3.2 Forest policies and forest management in PBSR

3.2.1 Forest policies and role of the RFD in PBSR

Despite PBSR being classified as conservation forest, our findings suggest that the RFD does not interfere with forest management in the village. The RFD allows the village a great deal of autonomy in deciding which parts of the forest are utility and conservation forest, respectively. In fact, one villager told us that "the RFD has no real jurisdiction here" with regard to utility and conservation forest on community land. The RFD expects the village committee to cooperate with them and to make sure forest policy is enforced.

Both the RFD representative and the villagers explained that it is the village committee that decides on a punishment, if someone breaks the rules concerning forest or orchard use. Villagers get a harder punishment, because they know the rules, while the punishment of outsiders depends on whether they know the rules or not. The punishment is lighter for people, who do not know the rules, the fine is 50 Baht/log for cutting timber. Punishment by the village committee can also take the form of differing degrees of social exclusion ranging from ' not being allowed to participate in some village festival' or 'do not talking to this bad person'. The village committee can also ask the RFD to take action and let the judicial system handle the punishment, which may be fines or even jail terms.

Box 3.2.1 Fire belts:

After the clearing of fire belts, the RFD comes to the village to inspect. The RFD will just inspect very quickly, because they understand we are very proficient at conserving the forest...the RFD is always impressed and amazed by what a great job the villagers do to protect the conservation and utility forest.

Village informants

Box 3.2.2 Forest fires:

There was a huge fire two years ago, which they were unable to stop. This taught them to do an even better job on the firebelts, and is the reason why there were signs of fire on the ground of the plot 4. The fire was started by another village, probably the Hmong village Huay Tao Roo (Moo 8).

There are three reasons for forest fires: 1) Natural causes, eg. lightning, 2) To make oyster mushrooms come out – however, BPSR does not have oyster mushrooms, so they would not start a fire for this reason, 3) for hunting, as this drives the animals forward. It is difficult to catch the person who has set a fire, but if he is found, he will be fined 2000 Baht.

TAO official living in PBSR

As part of the agreement with the RFD, the villagers of PBSR are also in charge of clearing fire belts within the forest surrounding the village in the month of April. We were told on several occasions that participating in activities, such as clearing fire belts or committee meetings, was obligatory, and you would be fined unless you sent a substitute or was sick in bed.

When asked about whether or not they were aware of the forest policy concerning the surroundings of PBSR, 17 respondents of households questionnaires answered affirmatively, while three said no. While the latter three may actually not know of the policy, it does seem unlikely that they do not know anything pertaining to the policy, considering the must-show rule as to attending meetings and activities, and the close-knit nature of the community. The main rule, as explained by the RFD and many villagers, is that you have to ask permission to cut down timber, you are not allowed to sell timber, and timber may only be cut in the utility forest. An informant described how there are rules as to which trees to cut, so that cutting is spread out all over the utility forest. He amended that " if they were allowed to sell the timber, the utility forest would be gone within a month".

3.2.2 Forest uses

According to the RFD representative, the villagers are allowed to collect NTFPs, however only for their own consumption. He also said, that they were allowed to collect "not so much" to sell, as this was their livelihood, and no attempt was made to control how much was in fact sold.

The most important forest product is firewood, which is collected by 90% of the respondents of the households questionnaires. Firewood is collected for less than one week usually in March, at the end of the dry season and when *miang* harvesting has not yet started. The firewood is used for steaming *miang*, and the resulting ashes are used as fertilizer and to decrease the acidity of the soil.



Figure 3.2.1 Forest products collected in PBSR; each respondent mentioned all products that pertained to him (Source: Household questionnaires)

60% of the respondents collect mushrooms, which they were allowed to do both from the utility and the conservation forest. They are almost solely collected for own consumption, and outsiders may ask permission to come and pick mushrooms as well, as mushrooms are seen as a fleeting good, which might as well be harvested rather than go to waste. 45% of the respondents said they collected medicinal plants.

We received conflicting information on whether or not hunting was allowed in the forest, but the overwhelming consensus was, that it was illegal both by official and village policy. Even so, three respondents admitted to hunting, while at least two professed knowledge that this was illegal. They hunt wild pigs (Figure 3.2.2), and do so whenever it is convenient without regard to mating or breeding season.


Figure 3.2.2 Ficus altissima in the forest, with stairs and hunting platform. Wild pigs in the forest (represented by the village children in their community map questionnaires) (Source: Fresu, T. 2011)

NTFPs	J	F	Μ	Α	Μ	J	J	Α	S	0	Ν	D
Green tamarind												
Herbal infusion mix												
Cinnamon												
Nuts for shower												
Honey												
Mushrooms												
Banana leaves												

Figure 3.2.3 Seasonal calendar of the NTFPs sold at the marke (yellow boxes= blossom, red boxes=fruiting, green boxes=harvest)

The forest provide during almost the main NTFPs sold at the market almost all year round (Figure 3.2.3). Generally the men collect the NTFPs and the women are in charge of any processing (drying or steaming) or packaging (like the fruits of *Phyllantus emblica*, thai or green tamarind) and of selling at the market.

3.2.3 Forest resource assessment

The aim of the assessment was to know how local users (Ostrom, 1999) manage forest resources and to what extend forest management in the village is sustainable and limited by the forest policy framework in act. The purpose was to evaluate the degree of disturbance in conservation and utility forests, through measurements of crown coverage, forest density (basal area, volume) and composition (climax and pioneer species, herbal/shrubs/trees layers) (Cappelli, 1990). The forest parameters, as the minimum diameter of the trees of 10 cm, have been chosen according the general definition of FAO of forest (2000) and growing stock (2004).



Figure 3.2.4 Map of the FRA plot in PBSR (2011)

The species found are evergreen and deciduous of the intermediate/moist forest vegetation type between 800-1200 m (Gardner et al., 2007). The understory layers, which are indicators of the climax vegetation and of the degree of naturalness more than trees, were generally composed by shrubs species suitable for the vegetation type and less disturbed sites (especially young rattan palms). Bamboos, mainly dominant in disturbed sites and lowland forests, were present sporadically only in surrounding of plot 3.

We evaluated the soil in the center of each plot to obtain information concerning the fertility of the areas, through the depth of the root zone and the organic matter content (dark color, capability to be modeled). Except for first plot, all looked very natural and vital, a sign that they have never completely lost the forest cover in the past.

Table 3.2.1 Soil evaluations made in the field during the FRA. Dark soil is a general indicator of good tenure of organic matter, high microbial activity and soil fertility.

Plot	First organic layer (cm)	Red oxided soil (cm)	Roots depth (cm)		
1	2 cm	X	only in the first 6-7 cm		
2	> 15 cm; very humid and dark	No	10 cm		
3	> 20 cm; very dark	No	15 cm		
4	> 20 cm; very dark	No	15 cm		

Figure 3.2.5 (left)The first layer of red oxide soil (left); The first layer of organic and deep soil (right)





Plot 4 (1169 m)	Rep. Contraction	Plot 3 (1182 m)
Village reservoir (1144 m)	Regime and the second s	Temple reservoir (1145 m)
Plot 2 (1137 m)	Creating St.	Temple <i>migng</i> field (1102 m
Watertanks, Plot 1 (1075 m)	Sman all	rempte mang net (1102 m
Miang field (1070 m)	Handard June	New Temple (1058 m)
Old temple (1057 m)	and when when	
Village and market (1032 m)	the second se	Village and market (1032 m

Figure 3.2.6 Transect walk in PBSR (2011)

Species	Local name	Number of trees	Shrub/Small tree	Open and semi-open forests	Secondary growth	Less disturbed forests	Edible fruits/seeds or usually cultivated	Firewood
Schima wallichii	Ta-lo	7	0	0	0	0	0	0
Garuga pinnata	Weed	3	0	1	0	0	0	0
Mallotus barbatus	Tao	3	1	1	1	0	0	0
Glochidion sphaerogynum	Man-pla	2	1	1	0	0	0	0
Castanopsis indica	Gor-na-hang	1	0	0	0	0	0	1
Adina (or Haldina) cordifolia	Gao	1	0	1	0	0	0	0
Grewia sessilifolia	Sian	1	0	0	1	0	0	0
Litchi chinensis	Litchi	1	0	0	0	0	1	0
TOTAL	8	19	2	4	2	0	1	1

 Table 3.2.2 Plot 1, species distribution in the utility forest of the temple area

<u>Plot 1</u> (crown coverage: 70%) was defined "utility forest", by Uncle Sa-Ngad, former member of the temple management area, but successively the head of the village pointed out that it was a forest in the temple area. It consists of an abandoned orchard (presence of a litchi tree) with several miang trees no longer coppiced (with stems of 6-7 cm of diameter). The estimated age of this new forest is approximately 10 years.



Figure 3.2.6 Diameter classes of plot 1



Figure 3.2.7 Basal areas in plot 1

Table 3.2.3 Plot 2: species distribution in the conservation forest behind the village reservoir

		Number of	Shrub/Small	Open and	Secondary	Less disturbed	Edible	
Species	Local name			semi-open			truits/seeds	Firewood
		troop	troo	foracts	growth	foracto	or usually	
Castanonsis indias	Gor no hong	uees	0	1016515	giowiii	1018313		1
	Gui-na-nang	4	0	0	0	0	0	1
Brassalopsis spp.	Tang-tor	4	0	0	0		0	0
Nyssa javanica	Mee	2	0	0	0	1	0	0
Melia azedarach	Hian-ham	2	0	0	0	0	1	0
Mangifera odorata	Mo-muang-lued	1	0	1	0	0	1	0
Syzygium cumini	Kee-pae	1	0	1	0	0	1	0
Schima wallichii	Ta-lo	1	0	0	0	0	0	0
Croton roxburghii	Pao	1	1	1	1	0	0	0
Albizia odoratissima	Gang	1	0	1	0	0	0	0
Lithocarpus craibianus	Gor-nam	1	1	0	0	0	0	1
Syzygium claviflorum	Ha-kee-pae	1	0	0	0	1	0	0
Semecarpus cochinchinensis	Ruk	1	0	0	0	0	0	0
llex umbellulata	Nao-nai	1	0	0	0	0	0	0
Castanopsis diversifolia	Gor-pan	1	0	0	0	0	0	1
?	Sang-nang-wan	1	0	0	0	0	0	0
?	Hian-men	1	0	0	0	0	0	0
?	King-tee	1	0	0	0	0	0	0
TOTAL	17	25	2	4	1	3	3	3

<u>Plot 2</u> (crown coverage: 80%) can be considered selection forest due to degree of stratification; the natural regeneration was lower than in plot 1. %) The shrubs species of the moist areas were abundant: Pandanus spp., Musa banana, Heliconia spp., Alpinia spp., tree ferns, rattan palms (we have been unable to determinate the species). The rattan diameters were well below of 1-2 cm and with very short stems. They are probably periodically harvested, leaving an appropriate amount of seedlings able to provide natural regeneration. The highest basal areas do not belong to indicator species of less disturbed forest, as we could expect in a "conservation forest", but to species often planted for edible

seeds and fruits or good timber (S. cumini, M. azedarach) or providing excellent firewood (L. craibianus, C. indica, C. diversifolia). These last three belong to the Fagaceae family, increasingly abundant in slightly fire-damaged areas of hill evergreen forest (Gardner et al., 2007).

The highest basal areas do not belong to indicator species of less disturbed forest, as we could expect in a "conservation forest", but to species often planted for edible seeds and fruits or good timber (*S. cumini, M. azedarach*) or providing excellent firewood (*L. craibianus, C. indica, C. diversifolia*).



Figure 3.2.8 Diameter classes of plot 2



Figure 3.2.9 Basal areas in plot 2



		Number of	Shrub/Small	Open and	Secondary	Less disturbed	Edible	
Species	Local name			semi-open			fruits/seeds	Firewood
							or usually	
		trees	tree	forests	growth	forests	cultivated	
Brassaiopsis spp.	Tang-tor	3	0	0	0	1	0	0
Gluta usitata	Rak-yai	2	0	1	0	0	0	1
Lithocarpus craibianus	Gor-nam	2	1	0	0	0	0	1
Nyssa javanica	Mee	2	0	0	0	1	0	0
Polyalthia viridis	Kam-mook	2	0	0	0	1	0	0
Anneslea fragrans	Sarapee	1	0	0	0	0	0	0
Mitrephora tomentosa	Kee-hen	1	0	0	0	1	0	0
?	Tao-dang	1	0	0	0	0	0	0
Quercus kerrii	Gor-sae	1	0	1	0	0	0	1
Artocarpus lakoocha	Had	1	0	1	0	0	1	0
Lithocarpus aggregatus	Gor-ta-moo	1	0	0	0	1	0	1
Castanopsis acuminatissima	Gor	1	0	0	0	0	0	1
Albizzia lebbekoides	Kang	1	0	0	0	0	1	0
Schima wallichii	Ta-lo	1	0	0	0	0	0	0
Sterculia villosa	Por-hoo-chang	1	0	1	0	0	0	0
TOTAL	15	21	1	4	0	5	2	5

Plot 3 (crown coverage: 60 %, in reason of some open spaces) represents a multilayered forest, which could be an indication of high degree of naturalness or also a result of different species growth rates. It appeared the least disturbed plot, which also turned out to have the largest (5) amount of indicators of a less disturbed forest; it did have also the highest ratio of number of species. We were told that this part of the forest had never been logged. Several elements instead suggest that the area has been (and it is still) subject to exploitation:

• around the plot we have found miang plants of an old plantation actually shaded by other dominant plants and several contiguous bamboo plants of Dendrocalamus hamiltonii Nees (Pai Hok), the only one allowed to be harvested and also used during the construction of the new temple reservoir (information collected from our local guide assisting the FRA, Mr. Pan).

• a huge Gluta usitata tree in the plot marked with a cross, maybe because of the very skin irritating sap (3), used as a source of lacquer for producing varnish, water-proof or preservative paint.

Like in plot 2, the higher basal areas do not belong to indicator species of less disturbed forest, but to species often planted (A. lebekoides), or with harvestable fruits seeds or fruits sap (G. usitata) or used for firewood (Fagaceae spp.). Thus the plot shows signs of having been intended for use.





Figure 3.2.10 Diameters classes of the multilayered forest in plot 3

Figure 3.2.11 Basal areas in plot 3

Table 3.2.5 Plot 4: species distribution in the utility forest in the village area

		Number of	Shrub/Small	Open and	Secondary	Less disturbed	Edible	
Species	l ocal name			semi-open			fruits/seeds	Firewood
openee	Looar namo			com opon			or usually	. non oou
		trees	tree	forests	growth	forests	cultivated	
Markhamia stipulata	Kae	4	0	1	0	0	0	0
Croton roxburghii	Pao	3	1	1	1	0	0	0
Styrax benzoides	Kom-yan	3	0	0	0	0	0	0
Baccaurea ramiflora	Ma-fai-pha	2	0	0	0	0	1	0
Syzygium cumini	Kee-pae	2	0	1	0	0	1	0
Fernandoa adenophylla	Kae-hang-kang	1	0	1	1	0	1	0
Irvingia malayana	Ma-mien	1	0	0	1	0	1	0
Siphonodon celastrineus	Ma-dook	1	0	0	0	1	0	0
Mangifera caloneura	Ma-muang-kom	1	0	0	0	0	0	0
Castanopsis armata	Gor-nam-laem	1	0	0	0	0	0	1
Polyalthia viridis	Kam-mook	1	0	0	0	1	0	0
Magnolia baillonii	Jam-peepha	1	0	0	0	0	0	0
Dalbergia assamica	Krad-dem	1	1	1	1	0	0	0
Nyssa javanica	Mee	1	0	0	0	1	0	0
TOTAL	15	23	2	5	4	3	4	1

Plot 4 (Crown coverage: 70%) presents a rate of natural regeneration low, probably for the presence of livestock browsing in the surrounding, with only one trees dominant layer. On the shrubs layer we have found species of the moist areas like small individuals of rattan palms, Wallichia siamensis, Heliconia spp., Alpinia spp.; herbaceous ferns and various grasses in the basal layer (nitrogen indicators). We observed burn vegetation on the ground and signs of cut and burned trees around the plot. S.cumini has the highest basal area like in plot 2, followed by species useful for firewood or timber purposes (C. armata, S. celastrineus).





Figure 3.2.13 Basal areas in plot 4

Concerning the growing stock percentage volumes, the Fagaceae never have the highest rates. We can explain this considering the importance of these species for charcoal and firewood. In utility forest (plot 4) their values are lower (9%) than in conservation forests (25% and 16%), according the "unofficial" distinction between conservation and utility forest applied in the village.

In the utility forest of plots 1 and 4 the volume percentages are lower than in the conservation plots (Table 3.2.6)

Plot	Species		Volume %
1	Castanopsis indica		2%
2	Lithocarpus craibianus	11%	25%
	Castanopsis indica	7%	
	Castanopsis diversifolia	7%	
3	Lithocarpus aggregatus	10%	16%
	Lithocarpus craibianus	4%	
	Castanopsis acuminatissima	2%	
4	Castanopsis armata		9%

Table 3.2.6 Volumes percentages for the Fagaceae species of the four plots.

3.2.4 Forest boundaries

According Wichautipong (2007), there are two main categories of forests, each managed with different access rules. Headwater forest (conservation forest), is conserved for the water run-off in reservoirs as drinking water source and basins for agricultural uses. Multiple-use community forest (utility forest) is for the collection of firewood and the harvest of NTFPs. All the forest of the watershed should be considered and managed as "conservation forest", which means that any logging activity is forbidden and only harvest of NTFPs in" reasonable amount" is allowed (interview with RFD in Mae Lor watershed and in Chiang Mai, community mapping session with market women).





Figure 3.2.14 Conservation and utility forest drawn

<u>Box 3.2.3:</u>

The example of a *kitsana* tree Box: One villager had a rare species of fragrant tree in his *miang* orchard; he used to cut them and sell them for 40,000-100,000 Baht, but since it became illegal, he did not do this anymore. Once the fragrant tree died, he was allowed to take it, but it could grow very old and big. According informations collected during informal conversations and the transect walks, the boundaries between conservation and utility forest are flexible in function of the needs and the changes of perceptions of the members of the village, as we have noticed concerning the plot n.4 of the FRA, slightly on slope. In this case after a long period of exploitation as utility forest, people decided twenty years ago to convert it on conservation forest, to allow natural restoration and protect the soil from erosion.

The distinction between the boundaries of the temple

and the village areas are important and well respected, especially under forest cover, where the demarcations are always present, visible and permanent.

3.2.5 Forest management and deagrarianization

Concerning access to forest resources, the only limitation according to the villagers, was that they were not allowed to cut timber. From the forest they obtained foods for their own consumption as well as various NTFPs, which provided 30% of the questionnaire respondents with a secondary income from the market in PBSR. The villagers also appeared to take great pride in their well-conserved forest, and while half of the respondents felt access to the forest had decreased, one informant attributed this to the fact that previously people did nothing to protect the forest, so of course there were more rules now. It did not appear as though forest policy was a push factor towards deagrarianization in everyday life. However, there were generally two answers given when we inquired about what it would take to make the young people come back to the village. These were 1) a better road, and 2) electricity. Both these things depend on the RFD to approve them. Currently, the road is being expanded in the curves, which will improve it somewhat, but a genuine improvement will likely result in cutting more forest than the RFD is willing to let them.

Getting electricity to the village is a project, they are working on with the temple, but it is currently on hold due to lack of funds. The Tambon official explained, that "Prabat Si Roy has no electricity because getting electricity to the village requires cutting down about 18 rai of forest which the RFD is not willing to allow". Thus, the in this regard the official forest policy does in fact appear to play a significant part in the deagrarianization process of the village. However, the villagers and the temple have shown a great deal of resourcefulness in many other projects, and it is most likely just a matter of a few years before the project will commence. On the other hand, the way the official policy is enforced, or rather, not enforced serves a a pull factor: The villagers feel secure in their right to living in the watershed and are able to make a good living combining sustainable agroforestry with getting an income from forest products.

3.3 Agricultural activities

The household questionnaires, all transect walks, SSIs and participatory observations of the farmers' fields indicate that the major agricultural activities in Ban Phrabat Si Roy are orchards and home gardens. There is no indication of shifting cultivation, field crop production or other types of agricultural practices not defined as agroforestry.

The questionnaire results indicate that 70% of the respondents cultivate orchard crops for both household subsistence and commercial purposes (Fig 5.1). Only 10% of the respondents use their orchard products solely for subsistence.



Figure 3.3.1 The main purposes of farming in Ban Phrabat Si Roy

3.3.1 Orchards

Based on our observations farmers grow mainly *miang* (Figure 3.3.2), *phlap*, *buoy* (Figure 3.3.3), *coffee* and secondarily other fruits such as *avocado* and *mango*. Orchards are the main source of income for the villagers. The results of SSIs and participatory observations indicate that almost everybody in the village grows *miang*. The orchard fields have existed for many, sometimes hundreds of years. Even before the establishment of the village, people regularly traveled to the area to collect *miang*. Farmers do all management practices such as trimming, weeding, grafting, coppicing, harvesting traditionally by hands. They keep the *miang* trees around a height of one meter to easily pick the leaves during harvest.

The farmers do not use any chemical fertilizers, pesticides and irrigation in their orchard fields. Their orchard production is completely rain fed and there is no need to apply any fertilizer to *miang* orchards, as it simply grows in highland forests and a hillsides and slopes (Phromrukachat *et al*, 2010).



Figure 3.3.2 Miang



Figure 3.3.3 Buoy

According to Phromrukachat *et al* (2010), *miang* is considered a lifestyle staple of people in Northern Thailand, particularly for hill tribes from where it likely originated. It is particularly favored by elders of the hill tribes who embark on extensive foot journeys throughout the mountain ranges as it provides energy and prevents the mouth from becoming dry at such high elevations (Phromrukachat *et al*, 2010).

Our findings suggest that *miang* is the major source of income for almost all farmers in the village (Figure 3.3.4). As the seasonal activity calendar made by the market women indicates, farmers harvest *miang* leaves every day from March to December. During harvest, only half of the leaf is picked, so that the leaves rejuvenate and will be ready for another harvest within three to four weeks. Only very few people consume *miang* in PBSR and farmers produce *miang* mainly for the market outside PBSR.

Phlap and *buoy* are other economically important agricultural products in the village (Figure 3.3.4). *Phlap* grows very fast after grafting; the tree needs only about two years for harvest. The fruits are harvested every year in July, whereas buoy is harvested from the beginning of March to the middle of April. *Phlap* and buoy are produced both for home consumption and for sale.



Figure 3.3.4 Mai agricultural products and their mai use (Source: Questionnaires)

During harvesting season miang adds to the farmers' income with an average of 9,122 Baht, whereas outside miang harvesting season, the average income is only 5,116 per month (Figure 3.3.5). This clearly shows that *miang* is the main source of income for the farmers in the village.



Household monthy income in Baht

Figure 3.3.5 Average monthly income of farmers during and outside miang harvesting season

Orchards provide a very good source of income and household subsistence for farmers. However, farmers do not have alternative crops appropriate for their environment. They are still mainly dependent on *miang, phlap* and *buoy*.

3.3.2 Home gardens

Many farmers also have home gardens, where they grow different vegetables, fruits, medicinal plants etc. (Fig 3.3.6).



Figure 3.3.6 The proportion of the questionnaire respondents who have home gardens

Through participatory field observations, the major agricultural crops grown in the home gardens were identified. These are mainly squash, *Plantago, egg plant, onion, cabbage, spinach, chili, tomato* and different fruits such as *orange, pineapple, mango and banana*. Many of these vegetables and fruits are grown both in the dry and rainy season.





Figure 3.3.7 Some of the vegetable home gardens in the village

Forest matoe 00 epared albag'e 2 28444.50 assead Forest St PL ava anano Vocado Homegarden たナーモモを B PERE PER, Forest FFE £

Figure 3.3.8 Some of the vegetable home gardens in the village

Farmers do not have good access to improved varieties. They simply grow what they think is good for their environmental condition. Moreover, very few farmers use chemical fertilizers in their home gardens. Only two or three farmers use urea for their production. Instead they mainly use chicken manure and charcoal as fertilizer.

Home garden vegetable production is mainly for own consumption but a few of the respondents, who have bigger gardens also produce for sale (Figure 3.3.9). During the rainy season they sell their produce to middlemen but during the dry season they sell them at the local market.



Figure 3.3.9 Purpose of home garden vegetable production

3.3.3 Soil analysis

The main intention of the soil analysis was to investigate the quality of soil in conservation forest, utility forest and orchard fields. It is also used to assess the impact of the soil quality on the major agricultural activities in the village. For the investigation, the soil chemical and physical properties such as soil Ph, soil electric conductivity (EC), the availability of plant macronutrients (N, P, K), soil bulk density and organic matter content were considered.

No considerable differences were found between conservation forests, utility forest and orchard fields for most of the parameters considered in the analysis. As shown in table (Table 3.3.1), all the soil samples collected showed high levels of acidity. The soil EC is low in all land use systems. The total N, available P and K are in medium state most of the land use systems. Moreover, the percentage of the soil organic matter content in orchard field and conservation forest is moderate, but high in the utility forest. The soil bulk density in orchard and in utility forest is low whereas in the conservation forest moderate.

Therefore, the soil analysis does not show a clear difference between the three land use systems. The ambiguity and lack of clear demarcation between conservation and utility forest and the overlapping of the orchard field with the forest causes difficulties in clearly distinguishing the three land systems in the village, and may have corrupted our results.

Soil sample	PH(1:1)	EC 1:5 (ds/m)	Total N (mg/kg)	Available P(mg/kg)	Available K(mg/kg)	% OM	Bulk density gm/cm3
	4,99	0,039	0,098	0,46	162	1,97	1,1
Orchard	Strongly acidic	Infertile soil With low CEC	Moderate	Medium	Medium	Moderat e	Low
Conservation	5,5	0,036	0,093	0,28	159	1,86	1,31
forest	Strongly acidic	Infertile soil With low CEC	Moderate	Medium	Medium	Moderat e	Moderate
	5,29	0,033	0,129	0,54	108	2,59	1,14
Ounty forest	Strongly acidic	Infertile soil With low CEC	Slightly high	Medium	Medium	High	Low

Table.5.3.1 Summary of the soil analysis result and its interpretation

(Hazelton et al. 2007, Uchida et al. 2000, USD, 2008,)

According to Hazelton *et al.* (2007), orchard crops for their potential productivity need a soil pH of at least 6 and most home garden vegetables such as *cabbage, onion, carrot, beet roots, spinach* and *cauliflower* require soil pH higher than 5.5 for their maximum productivity. However, the soil analysis indicates that soil from orchard fields are very strongly acidic with a pH value of 4.9. In such soil, all the major plant nutrients such as nitrogen, phosphorous, potassium, sulfur, calcium, manganese and also the trace element molybdenum are available in insufficient quantities (Uchida *et al.* 2000).

The other important parameter is the soil EC which indicates the soil salinity level. The soil salinity is an important parameter as it reflects the extent to which the soil is suitable for growing crops (Hazelton *et al* 2007). High EC values indicate a high presence of soluble salts, which inhibit plant growth.

The EC of the soil showed that all soil samples from the orchard fields, conservation and utility forest are infertile soils with low cation exchange capacity. Therefore, strongly acidic and infertile soil critically affect the productivity of both orchards and home garden vegetables. However, the villagers feel that their soil quality is very good and they do not use fertilizer to get a higher yield from their agricultural activities.



Figure 3.3.10 Purpose of home garden vegetable production (Source: Santorska, A. 2011)

3.3.4 The relation between agricultural activities and deagrarianization

In PBSR agriculture provides the major source of income for all the villagers. However, the agricultural activities are dominated by the traditional *miang* farming. The results from SSIs indicate that the demand for *miang* is declining, as it is mainly consumed by the older generation, and not palatable to the younger generations. This will likely be reflected in fewer people being able to base their livelihoods on this crop.

The villagers are taking steps to meet this development, though. They are actively seeking out information on new crops and learning how to grow them. In SSIs people expressed a great interest in diversifying their crops, both in order to meet the coming changes in demand as well as

to make a potential transition into agriculture easier for their kids, if they should choose to return to the village.

The analysis of the soil indicates, that many crops will be unable to reach their maximum potential in those fields. However, no one had any intention of ever selling their land, nor did any of the adults have any desire to live elsewhere or have another vocation.

The young generation, though, expressed no interest in becoming farmers. None of them worked in their families' orchards, and only one helped his mother in her home garden. This suggests, that the kids are less knowledgeable about agricultural practices than their parents, as the knowledge is not passed down. Even though they generally showed a great interest in living in their home village, they were still not interested in engaging in on-farm activities.

Box 3.3.1:

Uncle Sa-Ngad was starting a phlap production up. The first 40 trees had been harvested for the first time, and he averaged 7.5 kg from each. This year he will harvest from an additional 100 trees, and he is still grafting more phlap to increase his production for the coming years. (Transect walk, participatory observation and SSI with Uncle Sa-Ngad)

Box 3.3.2:

There is a problem with corruption from the agricultural department: In 1997 the department got baby coffee plants for them for 3 Baht, but the farmers had to pay 5 Baht for them. Then the department was supposed to help them with the coffee production, e.g. by helping them find middlemen etc., but the department just abandoned them, and they lost the investment [...] He has 2000 coffee trees, and the coffee grower committee in the village is going to start looking into coffee production again. (SSI with the Headman's Assistant.

Thus, even though the adults are farming and gaining new skills within the area, these skills are not transferred to their children, and the deagrarianization of the village will likely occur, whether or not the children move back to the village or not.

3.4 How is the temple affecting community development

3.4.1 The temple of PBSR and temple management

The legend of Buddha's footprint and Temple's popularity

The Buddhist temple in PBSR is popular within and beyond the Mae Lor watershed. According to the Tambon official, the temple is the most important of 10 Buddhist temples in the Tambon district (TAO interview, 2011). The temple's popularity can be attributed to the Footprints (Figure 3.4.1) in rock, believed to have been made from different incarnations of the Buddha.



Figure 3.4.1 Footprints of Buddha at PBSR temple (Source: Adeyiga K. 2011)

There are at least two different accounts to how these footprints were discovered but this does not retract from the strong belief Buddhists have in these Footprints. This strong belief is what has made the temple popular amongst religious Buddhists. The popularity of the temple has brought along with it great influence, both locally and beyond the borders of the village, bringing Buddhists (and tourists) to worship (or visit). Most ethnic Thais are Buddhists of the Theravada branch and when visiting the temple they will make merit (mostly in a form of monetary contributions). According to Keyes (1983) merit is made by the Theravada Buddhists for two reasons; as a form of spiritual insurance for prolonged living without suffering and to be seen as virtuous. The temple in PBSR uses monies accruing in temple coffers from merit making for temple administration and developments projects. According to a monk (2011) interviewed at PBSR, the temple used to be comprised only of the structure that houses the holy Footprints (see Figure 3.4.2). This building was renovated in 1993 and the temple began the building of housing facilities for the growing number of monks. Further expansion of the temple commenced with the building of the new temple in 1997 at total a cost of 45 million baht.



Figure 3.4.2 Temple building housing theFigure 3.4.3 The new Temple in PBSRFootprints [Source: Santorska, A. 2011]

Figure 3.4.3 above shows the new temple building funded from donations to the temple (Monk, 2011: Village Headman, 2011). The temple is currently seeing further expansion covering the total 74 rai of temple land. This includes the construction of 28 new guest rooms, meditation centres and other structures to mount more Buddha images.

According to a Buddhist nun interviewed (2011), a television programme from 2010 made about the PBSR temple helped create awareness of the temple's peculiarity and increased tourists numbers. Results from a total of 25 tourist questionnaires however show that, the majority (32%) of tourists visit the temple for religious purposes.

3.4.2 Temple's contribution to community development and livelihoods

Many infrastructural developments in PBSR can be attributed to the temple (Monk, 2011: Head of housewives, 2011: Headman, 2011). The temple has been the driving force behind many developments which in combination have improved access to the community and contributed to household incomes and diversification of these directly or indirectly.

3.4.3 Infrastructural developments in the community

Before the concrete road was constructed with funding from the Temple, PBSR was mostly inaccessible in rainy seasons due to slick, the winding and narrow dirt road (Headman, 2011). This resulted in a low patronage of both tourists to the temple and of middlemen to buy *miang* from farmers. In 1993, the temple funded the construction of the concrete road (Monk, 2011) with villagers providing labour. With the new road (currently being expanded at the curves by villagers

with

Box 3.4.1:

"About 50 tourists visit the village on non-busy day and more than a 100 tourist on weekends. At festivals there can be more than a 1000 tourists. The biggest festival here is on 18^{th} and $19^{th of}$ March"

Interview with Village Headman (2011).

community funds), tourist numbers increased and villagers have seen an increase in incomes from selling directly to tourist or to increased numbers of middlemen coming to the village to buy their products. Alternatively, farmers can also now easily take their products directly to markets to sell for better prices.



The temple has also built a market near the footprints, which the village women use at no fee (Monk, 2011). This no fee claim by the monk was however refuted in an interview with the head of the Housewives Association (2011) (and also a market woman). She stated that each market woman (27 in total) was levied 50 Baht monthly by the temple. However considering the incomes made from selling at the market (100 -200 Bahts on weekdays, 300-400 Bahts on weekends and over a 2000 Bahts at festivals), this amount is a relatively small price to pay considering they work at the market 7 days a week. At the market, women displaying an assortment of products (see Figure 3.4.4) sell mostly to visitors to the temple and they acknowledged that the market offers many opportunities to sell a variety of products which significantly contribute to household incomes.

Additionally the temple in 2010 expanded its water reservoir and the road leading up to it. This bigger reservoir supplies water to all temple buildings including the toilets and washrooms



located at vantage positions for all visitors. This takes the pressure off the village's source of water, especially at festival times when tourist numbers are very high. The temple also paid for the construction of a ramp (see figure 3.4.5) from which rockets are launched during the Water Festival in March.

Figure 3.4.5 Ramp for fire festival at PBSR (Source: Santorska, A. 2011)

3.4.4 Temple – Tourism related income opportunities

Tourism is the second major benefit provided by the temple and has profoundly affected household incomes and is a contributory factor to villagers diversifying livelihoods away from predominantly farming *miang*. This diversification of livelihoods is seen in an emerging service sector of convenience shops, a restaurant and a guest house. The fact that 64% of tourists have visited PSR more than once (Figure 3.4.6) indicates the importance attached to the temple. Consistent tourist numbers ensures a stable income to households whose livelihoods depend on selling products to these tourist e.g. 'leaf gold' which yields a 100% profit as it is bought at 10 Bahts and sold for 20 Bahts to tourists (Interview with woman selling leaf gold at the new temple, 2011).



Figure 3.4.6 The graph shows how many tourists visited PBSR for the first time

Tourist patronage of products has also diversified products away from solely local ones. For example market women buy flowers from middlemen from Chiang Mai to make flower bouquets (see Figure 3.4.7) which tourists purchase to offer to the holy Footprints. Others also sell green tea products from outside PBSR. Some local products are also processed to meet tourist demand. The Thai tamarind, which was the biggest profit earner in the NTFP ranking exercise (see Table 3.4.1) is a favourite of tourists and is processed into a sweet snack.



Figure 3.4.7 Woman making flower bouquets at the market (Source: Adeyiga. G. 2011)

Market Women	Forest fruit Shower infusion	Tree bark infusion	Cinnamon	Thai Tamarind	Plantain leaves	Honey	Mushroom
1	4	2	1	3	7	5	6
2	6	2	3	1	7	4	5
3	5	2	3	1	7	6	4
4	5	2	3	1	7	4	6
5	4	3	2	1	7	5	6
6	5	3	2	1	7	4	6
7	2	4	5	1	6	7	3
Total	31	18	19	9	48	35	36
Rank	4 th	2 nd	3 rd	1st	7th	5th	6 th

Table 3.4.1: NTFPs ranking showing the most profitable NTFP according to the market women

The restaurant is a lucrative business with high patronage on weekends and festivals sometimes resulting in some customers being turned away for a lack of capacity to host them (Restaurant owner, 2011).

3.4.5 Temple and community relations

The interviews conducted show local people consider the temple as playing a paternal role. The villagers understand and also appreciate the power and influence of the temple, especially the visionary leadership of the Abbot (Figure 3.4.8) under whose guidance most of these developments have taken place. These villagers know that the temple is financially capable to provide and improve facilities for instant, as the temple has paid 1 million Bahts out of the 6 million Bahts needed to lay underground cables for the electrification project of the village and the temple

In return for providing and improving facilities villagers are expected by the temple to keep the surroundings clean and remain hospitable to visitors.



Figure 3.4.8 Current Abbot of PSR temple (Source: Santorska, A. 2011)

In the community mapping exercise the market women mapped what was important to them. This consisted of home gardens, *phlap* and *miang* fields and included the holy Footprints, new temple and the four spiritual homes (Figure 3.4.9). This showed that these villagers had a great respect and appreciation for opportunities the temple provides.



Figure 3.4.9 Market women engaged in community mapping (Source: Fresu, T. 2011)

3.4.6 Temple's influence and contributions to forest management

As a result of this paternal influence, coupled with the temple's financial benevolence to community projects/development and the Buddhists' beliefs of villagers, the Temple has in some instances been called upon to prevail in forest conservation matters involving local people (Monk,

2011: RFD, 2011: Tambon Official, 2011). The abbot occasionally informs the locals on forest conservation measures and also employs them to protect forest.

The temple also has a keen interest in maintaining the forest for the microclimate it provides, because as Theravada monks (also referred to as forest monks) they practice spiritual growth in the wilderness. As observed, most Theravada monasteries are located in forested areas or planted with trees in locations that lack forests. Forest monks preserve trees and since the locals respect the monks, the forest is inherently conserved locally (Rigg, 1983). Results from questionnaires also show the microclimate in PBSR is another reason why tourists visit. The focus group discussion with children also revealed they would relocate to the village because of the forest microclimate.

3.4.7 The influence of the temple on livelihoods and deagrarianization in PBSR

The impact of the temple on the development of PBSR is very important. The initial infrastructural improvements, i.e. the concrete road and the temple renovation and construction, laid the foundations of the relatively high standard of living obtained by the villagers. They quickly grasped the opportunities that opened up, creating a synergy with the temple, which is spawning growth and new opportunities for both institutions.

The increasing amount of tourists drawn to PBSR is creating a service sector, which appeals to the younger generation, who hold little interest in farming. They find it far trendier to own a B&B than to harvest *miang* for old people. However, first they all want to get a higher education.

An important aspect of the influence of the temple is, that the DL is currently in the process of issuing chanods to all villagers in PBSR, even though the village is located in conservation forest,

Box 3.4.2:

"The people here are protected by the Abbot, so even if they have no land documents, they are more secure in their landholding compared to other villages"

Ajan Orathai, 2011, pers.comm., March 8th

which should preclude the possibility of gaining chanods. The remaining harbor no worries as to the security of their right to their land.

A reaction to the changes occurring in PBSR could have been a nostalgia for 'the good old days', before tourists descended on the village in hordes, however, all informants, without reluctance, expressed a wish for an increase in tourist numbers.

Thus, the temple creates push and pull factors with regard to deagrarianization. The greatest pull factor is the good income; however, this also brings opportunity to receive a good education and further better their lot in a more modern part of the world. The income increase is therefore a duality, being both push and pull factor.

Almost all the kids hoped to return to the village to live permanently, but due to the temple they believe they will be able to make a future living in the village without engaging in agriculture. However, they clearly stated they would never sell the land once they inherited, so it is likely they will continue with some sort of agroforestry, probably as a secondary income, on land they feel secure in owning.

So the temple is assisting in the agrarian transition in transforming unskilled farm labour into skilled service sector labour, while still maintaining the village structure intact.

4. CONCLUSIONS

One of the first things, one notices in PBSR is, that there are no young people. Outside school holidays, there are no people below the age of 35 living in the village. This is the face of deagrarianization in PBSR.

PBSR is an unlikely success story; a remote mountain village, where growth in income and living standard has been steadily rising for almost 20 years. The good fortune is largely due to an ambitious Abbot, who has worked hard to create a spiritual attraction drawing devout Buddhists in the thousands. In order to achieve this, he among other things, improved the infrastructure of the village, which has formed the foundation of the betterment of the villagers' livelihoods.

The improvement in their income is based on easier access to markets and better opportunities to diversify their livelihoods towards service sector jobs. They also have easier access to information and credit, which has helped them grow a wider range of cash crops allowing them a higher income also outside the miang season.

Even with the availability of credit, the villagers have made financially sound investments, with loans made to ensure higher profit rather than an immediate improvement in living conditions. Thus, they are not burdened by their loans, but rather freed.

The higher income has also allowed them to widen the future possibilities of their children drastically: All children are getting a higher education, which will enable them to pursue a career in the modern world, while they also have the opportunity to come back to the village to use the family land or start a business there. The children are grateful for these choices, but want the chance to explore a more modern life, before maybe eventually returning to the village.

Villagers in PBSR are also fortunate as the special status of the temple has extended to them as well with regard to chanods: Exceptionally, chanods are being issued to PBSR villagers, who hold any kind of land documents, even though their residence inside conservation forest is actually illegal. And the remainder of the villagers are in the process of receiving a community land-title deed. Even though only the former deed is in fact legally binding, no one expresses anything but the utmost confidence that they have all rights that matter to their land.

The process of de-agrarianization during the time has caused a lack of agricultural labor and consequently natural forest regeneration in many areas interested by miang plantations, as plot n. 1 and 3. We can consider de-agrarianization a driver to natural forest regeneration with an indirect role in protecting the watershed forest cover, without the need of promoting massive plantations by RFD as in other zones..

Thus, the deagrarianization taking place in the village is of a benign character. The villagers are able to diversify their livelihoods according to their wishes to an increasing extent, while continuously raising their standard of living. The migration of the young people is voluntary brought about not by desperation, but by embracing a host of new opportunities.

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7. APPENDICES

Appendix 1 Research Table

Problem formulation	Ι	Main Research	Sub Questions	Required Data	Appropriate Methods
		Question			
What are the effects of forest policy, agricultural activities and the temple on livelyhoods in PBSR and how are they related to deagrarianization?			1. What is the policy framework related to access and tenure of Utility and Conservation forest?	Information on types of access and tenure Enforcement of policy	 Secondary data Interview with RFD Interview with key informants
	I	How do forest- related factors impact livelihoods?	2. What are the local provisions for forest management?	Identification of traditions and Custom influencing forest management.	 Interview with key informants Interview with traditional leader Interview with the abbot Interviews of resources users
			3. How do the locals use the forest?	Identification of forest uses Identification of the state of the forest	 Interview with key informants Seasonal calendar Forest resource assessment Interview with traditional leader Questionnaires
			1. To what extent are the villagers farm-based?	Identification of main sources of income amongst villagers Information on current livelihoods and diversification of livelihoods	 Questionnaires Interview with key informants
	II	How do the villagers' agricultural activities affect their livelihoods?	2. Which agricultural activities do the villagers undertake?	Identification of agricultural activities Identification of soil quality	 Questionnaires Seasonal calendar Participatory observations Transect walks Soil analysis
			3. To what extent is the income provided by agricultural activities considered sufficient?	Assessment of on farm, off-farm and non- farm incomes Villagers income satisfaction Access to the market	 Semi structured interviews Questionnaires
	ш	How is the temple affecting livelihoods?	1. Which physical changes has the temple caused in the village?	Identification of physical changes provided by the temple	 Interview with key informants Timeline
			2. Which income	Identification of incomes related to	 Interviews with market women
			opportunities does the		Seasonal
temple provide?	tourism.	calendar for tourism activities and peak season for tourists			
---	--	---			
3. How has the villagers' livelihoods changed as a consequence of the temple?	Livelihood changes Income changes Diversification of strategies	 Questionnaires Interview with market women timeline 			

Appendix 2 Field Activities

Date	Who	Where	Activities	Results-Outcomes
Monday	Kira, Teresa	Royal Forest	Interview with Mr.Manukit	Summary of the meeting.
28th		Department	Surintipa, head of the Royal	Photos.
February			Forest Department for the Mae	
			Lor Watershed	
	All the group	Phrabat Si Roi	Preliminary transect walk	3 GPS points.
	members	(down to the main street)		Photos.
Tuesday	All the group	Right side of the	Transect walk with former	Observations of land uses, vegetation, mapping with
1 March	members	watershed	member of the temple	OPS. Composite soil compling: 1 in orchards 1 in
			management group	conservation forest
				Photos
	Gloria and Ing	Households	Ouestionnaires	4
	Pises and Gik	Households	Questionnaires	5
	Walid, Ania.	Left side of the	Transect walk with former	Observations of land uses, vegetation, mapping with
	Teresa, Bekele.	watershed	member of the temple	GPS.
	Tawee		management group	Composite soil sampling: 1 in utility forest.
				Photos.
Wednesday	All the group	Restaurant	Meeting with the head of the	Presentation of the group and our research project,
2 nd March	members		village	informations about
				Village, possible key informants and the different
				management groups.
	Walid, Ania,	Village	Mapping of households,	GPS points, photos.
	Pises		temples, building related to the	
	Claria Tarraga	Montrot	temples, commercial activities	Informations and contring of NTEDs
	Gioria, Teresa,	Market	NTEPs repland	Photos
	Dises	Households	Questionnaires	222
	Teresa Gloria	Household	Questionnaires	1
	Ing	nousenora	Questionnares	1
	Kira and Gik	Temple area	Interview with woman monk	Informations in the temple.
	Kira, Ania, Gik	Temple area	Questionnaires with tourists	4
	Gloria, Kira, Ing	House of the Caretaker	Interview with the Caretaker	History of the temple and monks involvement in
	•	monk	monk	forest management.
Thursday	All the group	Restaurant	Meeting with the head of the	Discussion about different maps and positioning of
3th March	members		village	the different parts of the village.
	Ania, Bekele,	Household	Questionnaire	1, observation in the field (participatory observation)
	Walid, Kira, Gik			
	Gloria, Teresa,	Market	Seasonal calendar, community	Charts, photos, videos.
	Ing		mapping with market women.	Information about strategies of the future for the
			Interview with housewifes	children and land ownership.
			group nead	
	Ania, Bekele,	House of adviser of the	Interview	Information about temple and forest management
	Kıra	temple management		group.
Eriday	Tamaga Claria	group		Observation in the field of one merilest women
4 th March	Ania Bakala	temple		(participatory observation)
4 Watch	Ing	temple		(participatory observation)
	Walid Kira Gik	Home of the head of the	Interview	Interview with old members of the village. Timeline
		village	Questionnaire	2
	Teresa, Ing	Market	Questionnaire	2
Saturday 5th	All the group	Base camp	Mid term evaluation	Presentations
March	members	r		Intergroup discussion
	-			
Sunday	Teresa, Gloria.	Utility forest in temple	Forest Resources Assessment	Plot of 20mx20m, classification of trees and some
6th March	Ania, Walid,	area		shrubs and herbal species, evaluation of soil. Photos.

	Ajan Orathai, head of the			
	village .			
	Teresa, Gloria, Walid, Ajan Orathai, head of the village.	Conservation forest over the village reservoir	Forest Resources Assessment	Plot of 20mx20m, classification of trees and some shrubs and herbal species, evaluation of soil. Photos.
	Bekele, Kira, Ing, Gik, Ania	Temple area	Tourists questionnaires Focus discussion and community mapping with the village children	Chart, photos, videos.
	Kira	Restaurant	Informal interview	Informations about social life in the village.
Monday 7th March	Teresa, Gloria, Walid, Ajan Orathai, Pan	Conservation forest over the temple reservoir	Forest Resources Assessment	Plot of 20mx20m, classification of trees and some shrubs and herbal species, evaluation of soil. Photos.
	Teresa, Bekele, Walid, Ania, Ajan Orathai, Pan	Utility forest in village area	Forest Resources Assessment	Plot of 20mx20m, classification of trees and some shrubs and herbal species, evaluation of soil. Photos.
	Kira, Bekele, Gik, Ing	Households	Questionnaires	2
	Gloria, Gik	TAO district	Interview	Land tenure system in the watershed.
	Kira, Ing	Households	Informal discussion	Clarification about questionnaires.
Tuesday 8 th March	All the group members	Temple guest house	Discussion	Evaluation of the methodologies applied and the results obtained
	Teresa, Ajan Orathai	Temple guest house	Translation from local to thai names of the forest trees species	Classification of the species assessed during the FRA
	Kira	Restaurant of the village	Interview with member of TAO district	Information about local land tenure system
Wednesday 9 th March	Teresa, Walid, Pises, Ajan Orathai	Streams of the village and temple reservoirs, temple reservoir, river before the first home and the last one of the village	Water sampling	5 sampling
	All the group members	Market	Presentation of our field activities to the market women	Feed-back of our work to the village trough a photos presentation of our main activities in the village

Appendix 3: Household questionnaires

แบบสำรวจ/สอบถาม

GPS code:	
Address/House No.	

<u>ส่วนที่ 1: ข้อมูลส่วนตัว</u>

Part 1. Personal profile of respondent (*Mark the appropriate box*)

เพศ

ชาย Male

หญิง_{Female}

ชื่อ ____

นามสกุล_____

First name

อายุ Age

<20 30 - 40 50 - 6020 - 30 40 - 50 >60

สถานภาพในครอบครัว Status in family

พ่อ /แม่

Mother/Father

หัวหน้าครอบค

Last name

รัว нь.

ลุง/ ป้า Aunt/Uncle

อื่นอื่น

Other____

ระดับการศึกษา Education

ประถมศึกษา

มัธยมศึกษา

Secondary

สูงกว่ามัธยม

Higher

สถานที่เกิด Place of birth

Primary

บ้านพระบาท hers/his home (Ban Phrabat) เมืองอื่น/หมู่บ้านในหุบเขาแม่เลาะ Another town/village in Mae Lor valley เมืองอื่น/ภายในจังหวักเชียงใหม่ Another town/village within Chiang Mai provinve

เมืองอื่น/ที่ไม่ใช่ประเทศไทย Another town/village from outside Thailand

ระยะเวลาที่อาศัยในหมู่บ้าน Settlement period in the village

<5 years 5-10 years

10-15 years >15 years

ลำดับอาชีพ Occupation ranking

ชนิดของอาชีพ	อาชีพหลัก	อาชีพรอง	อาชีพอื่นอื่น
Type of occupation	Main	Secondary	tertiary
ชาวนา			
Farmer			
ค้าขาย			
Self employed trader			

รับราชการ		
Government servant		
เสมียน		
Clerk		
ครู อาจารย์		
Teacher		
รับจ้างทั่วไป		
Wage labour (-)		
NTFPs collector		
นักเรียน		
Student		
ดูแลเด็ก		
Child care (-)		
ตัดไม้		
Logging (-)		
อาชีพอืนอืน		
โปรดระบุ		
Other, please specify		

ส่วนที่2 : สถานภาพเกี่ยวกับครอบครัว

Part 2. Family profile of respondent

	ชาย	หญิง
97	Male	Female
จำนวนสมาชิกในครอบครัวทั้งหมด _{No. of family members}		
จำนวนสมาชิกในครอบครัวที่อายุน้อยกว่า 18 ปี _{No. of children <18 yr}		
จำนวนสมาชิกในครอบครัวที่อายุมากกว่า 18 ปี _{No. of adults >18 yr}		
จำนวนสมาชิกในครอบครัวที่สนับสนุนค่าใช้จ่ายในครอบครัว		
No. of family members contributing to household income		
จำนวนสมาชิกในครอบครัวที่สำเร็จการศึกษา		
No. of family members with education:		
ประถมศึกษา จำนวน (_{Primary)} คน		
มัธยมศึกษา จำนวน _(Secondary) คน		
มหาวิทยาลัย จำนวน (_{High)} คน		

รายได้หลักของครอบครัว Rank the households' major sources of income:

ชนิดของรายได้ type of income	รายได้หลัก	รายได้รอง	รายได้เสริม
การขายพืชเศรษฐกิจ Sale of cash crops			
การขายผลิตภัณฑ์ป่าไม้ _{Sale of forest}			
products			
การขาย NTFPs Sale of NTFPs			
การขายสัตว์ Sale of livestock			
การขายพืชผลไม้ _{Sale of fruit}			
การขายสินค้าหัตถกรรม sale of handicraft			
ค้าขาย _{Merchant}			
การส่งเงิน _{Remittances}			

รับจ้าง Work for hire		
ธุรกิจของตัวเอง _{Own business}		
สวัสดิการสังคม _{Social welfare}		
ค่าจ้างแรงงานในภาคเกษตร _{wage}		
labour in agriculture		
ค่าจ้างแรงงานนอกจากเกษตรกร		
Wage labour outside agriculture (-)		
ค่าจ้างแรงงานภายในหมู่บ้าน _{wage}		
labour inside the village		
ค่าจ้างแรงงานนอกหมู่บ้าน _{Wage labour}		
outside the village		
อื่น ๆ โปรดระบุ		
. ,		

Fill out the pie chart by answering following questions:

How much of your consumption is covered by crops (C) that you produce? How much of your consumption is covered by NTFPs (N)household collect? How much of what you consume is bought on the market (M)?

Example:





<u>ส่วนที่ 3</u>: เกี่ยวกับที่ดิน และการครอบครองที่ดิน ได้โปรดใส่เครื่องหมายลงในกล่อง

Part 3. Land and tenure

(*Mark the appropriate box*)

คุณเป็นเจ้าของที่ดินทางการเกษตรในบ้านพระบาท? Do you own any agricultural land in Ban

Phrabat? (-)

มี

ไม่มี

คุณเป็นเจ้าของที่ดินทางการเกษตรในบ้านพระบาท? Do you own any agricultural land

outside Ban Phrabat (-)

ใช่ คุณมีพื้นที่ใช้สอยที่คุณใช้ทำฟาร์ม การเกษตร แต่คุณไม่ได้เป็นเจ้าของไหม

Do you have access (but not ownership) to the land that you can farm? $\hat{\mathbf{1}}$

คุณได้ที่มาอย่างไร

ชื้อมา

ทางรัฐบาลให้มา

จำนวนที่ดินของคุณมีเท่าไหร่

น้อยกว่า 10 ไร่

11 – 15 **ไว่**

16 – 20 ไร่

How did you get land?

Bought it Given by the Government ไม่มี

มรดกตกทอด อื่นอื่น โปรดระบุ

>20 ไร

Inherited
Other, please specify_____

<u>ส่วนที่4: ข้อมูลด้านการเกษตร</u>

โปรดใส่เครื่องหมายลงในกล่อง

Part 4. Agriculture

(*Mark the appropriate box*)

คุณมีที่ดินกี่ไร่ที่ใช้ในการทำเกษตรกรรม Number of cultivated fields (-)

คุณมีที่ดินกี่ไร่ที่คุณไม่ได้ใช้ ว่างเอาไว้ Number of fallow fields _____

ครอบครัวคุณมีกี่คนที่มีอาชีพฟาร์ม Number of household member(s) work on the farm _____

ชนิดของฟาร์มที่ทำเพื่ออะไร Type of farming (-)

ดำรงชีพ	ค้าขาย _{commercial (-}	ทั้งสองอย่าง
subsistence (-))	both

คุณมีผลผลิตทางการเกษตรอะไรบ้าง และมีเป้าหมายอย่างไร

What agriculture products do you produce and for what purpose?

ชนิดของพืชผล	ใช้เอง	ขาย	ทั้งสองอย่าง	อาหารสัตว์
Crops	Own use	Sale	Both	Fodder
ข้าว เนินเขา				
Hill rice				
ข้าวเปลิก				
Wet rice				
เมี่ยง				
Miang				
ผัก				
Vegetables				

พลับ		
116121		
Plum		
ส้มโอ		
Pomelo		
ลูกแพร์		
Pear (-)		
ลิ้นจี		
Luchas		
Lycnee		
บ้อปลา		
Fish ponds		
เลี้ยงหม		
ય		
Rear pig		
เลียงไก่		
Poor chickon		
อนอน เปรดระบุ		

ที่ฟาร์มคุณ คุณได้ใช้ปัจจัยทางการเกษตรอะไรบ้าง Which agro-inputs do you use in

farming?

สารกำจัดศัตรูพืช _{Pesticides} สารเคมีกำจัดวัชพืช _{Herbicides}

วัชพิช _{Weedcides (-)} ขยะอินทรีย์ _{Organic waste} อื่น ๆ โปรดระบ<u>ุ</u> ปุ๋ย _{Fertilizer} สัตว์พืช เช่นแมลง _{Animals feeds} เครื่องจักร _{Machine} ไม่มีของเหล่านี้ _{Non of this}

<u>ส่วนที่ 5 . การใช้ป่าไม้</u>	โปรดใส่เครื่องหมายลง	ในกล่อง
Part 5 . Use of forest (*	Mark the appropriate box)	
การเข้าถึงทรัพยากรธรร	มชาติได้เปลี่ยนไปมากไหม	1
ในระยะหลายปีที่ผ่านมา		
How your access to natural resources has o	changed over time?	
increase	decrease	no change
ป่าไม้สำคัญกับคุณอย่างไ	ไร เลิอกข้อหนึ่ง _{How is the forest}	important to you? (Pick one)
เก็บของป่า ^{Collect forest}		การท่องเที่ยว ^{Tourism}
products	ทำฟาร์มควบคุมการกั	
	ดเชาะ Controls erosion	
อื่นอื่น		

โปรดระบุ_____

พิชผล ชนิดไหนที่คุณเก็บมาจากป่า และบ่อยแค่ไห Which forest products do you collect and

how often?

	ทุกวัน ^{Everyday}	>3ครั้งต่อ อาทิตย์ >3 times per week	<3 สามครั้งต่อ อาทิตย์ <3 times per week
ฟื้น Firewood			
ถ่าน _{Charcoal}			
ไม้แปรรูป			
ភ័ពតុดិប Raw material			
วัสดุในการก่อสร้าง Material for construction			
สัตว์ป่า Wild animals			
สมุนไพร Medical plants			

เห็ด Mushrooms			
ผัก Vegetables			
ผลไม้ Fruits			
เมี่ยง _{Miang}			
Plap			
น้ำผึ้ง Honey			
อื่น ๆ โปรดระบุ			
่ครอบครัวมีการแบ่งห	่หน้าที่กันไ	หม ว่าใครต้องเก็	บอะไร?
اs the collection of forest products d ۹ ماد	livided between h	ousehold members? ۲	1.
<u></u> វេរា Yes			ll No

คุณต้องได้รับอนุญาติไหมในการเก็บ NTFPs? Do you need permit to collect NTFPs?

ใช่

ไม่

คุณ หรือสมาชิกในครอบครัว มีส่วนร่วมในกิจกรรมการอนุรักษ์ธรรมชาติไหม?

Are you/your household involved in any forest conservation activities? (-)

์ใช่

ไม่

Thank you for your co – operation/ ขอบคุณมากค่ะ

<u>ส่วนที่ 6: การตลาด</u> โปรดใส่เครื่องหมายลงในกล่อง

Part 6. Market

(*Mark the appropriate box*)

คุณขายสินค้าคุณที่ไหน Where do you sell your products?

ในหมู่บ้าน In the village

รอบนอกหมู่บ้าน Outside the village

ในตลาดเชียงใหม่ เก Chiang Mai

^{market} ตลาดใกล้วัด _{Market near the temple} อื่นอื่น โปรดระบุ ตัวแทนรัฐบาล _{Government agencies} ร้านขายของชำา _{Road side stalls} (-)

ใครชื้อสินค้าคุณ Who buy your products?

องค์กรณ์ชาวนา Farmers

organizations ชาวต่างชาตี Tourists who come to

village (-) คนในชุมชน Local people

คนรอบนอกหมู่บ้าน People outside

the village

อะไรคือข้อจำกัดหลัก ในการขายสินค้าคุณ What is the main constrain in selling your products? การเข้าถึง เช่นถนนไม่มี Accessibility (lack of roads etc.)

ไม่มีคนชื้อ No buyers for products
รยะทางไกลจากตลาด Distance (to far from the market etc.)
การขนส่ง _{Transportation}
ราคาถูกเกิน To low price (-)
อื่นอื่น
โปรดระบุ

สมาชิกคนไหนที่เป็นคนขายสินค้า Which household members sells products:

หัวหน้าครอบครัว _{Household head} ผู้หญิง _{Women}

ผู้ชาย _{Men} เด็ก _{Children}

Thank you for your co – operation/ ขอบคุณมากค่ะ

<u>ส่วนที่ 7. การอพยพ</u> โปรดใส่เครื่องหมายลงในกล่อง

Part 7. Migration

(Mark the appropriate box)

สมาชิกในครอบครัวคุณ มีใครใครอพยพมาจากต่างหมู่บ้านไหม และทำไม

Do any of household member(s) migrate from the village and why?

	ชาย	หญิง	
	Male	Female	
จำนวนสมาชิกในครอบครัวทีไม่อยู่ในหมู่บ้าน			
No. of household member(s) that left the village			
จำนวนสมาชิกในครอบครัวที่ทำงานนอกหมู่บ้า			
นพระบาท แต่อาศัยอยู่ในหมู่บ้าน			
Number of household member(s) who work outside but live in Ban Phrabat			
เหตุผลของการอพยพ	ตลอดไ	ฤดูกา	ไปไปมา
Reasons of migration	ป	ล	มา
	Permanent	Seasonal	Daily
			(commuting)

แรงงาน Labour		
แต่งงาน _{Marriage (-)}		
การเรียน _{school}		

คุณคิดว่าทำงานนอกหมู่บ้าน น่าสนใจมากกว่าไหม Do you find work outside the village more

attractive? ให่

ไม่

ไม่มี

คุณถูกกระตุ้นให้ทำงานนอกหมู่บ้านพระบาทไหม

Did you encourage or was encouraged to take a job outside Ban Phrabat? ไม่ใช่

ให่

้มีสมาชิกคนไหนในครอบครัว ที่วางแผนไปทำงานนอกหมู่บ้านพระบาทไหม

Is any of the household member(s) planning to find a job outside the village? มี

คุณอยากทำอาชีพอะไร What is your job preference? ทำฟาร์มตัวเอง บนที่ดินตัวเอง Farm your own land

ขาย NTFPs/สินค้าหัถกรรม sell NTFPs/handicraft ทำงานนอกหมู่บ้าน work outside of the village อื่นอื่น

โปรดระบุ

Thank you for your co – operation/ ขอบคุณมากค่ะ A. นโยบายป่าไม้ โปรดใส่เครื่องหมายลงในกล่อง

Forest Policy

คุณตระหนักถึง นโยบายป่าไม้ ที่เกี่ยวข้องในบรีเวณบ้านพระบาทไหม?

Are you aware of the forest policies regarding to the forest near Ban Phrabat?

ให่

ไม่

มีนโยบายป่าไม้ในปัจจุบันให้ผลประโยชน์ทางเศรษฐกิจไปยังหมู่บ้านหรือไม่

Are the present forest policies providing economic benefits to the village?

มี

นโยบายป่าไม้เป็นประโยชน์คุณหรือไม่ Are the forest policies benefits you?

ใช่ _{Yes}

ไม่เป็น №

ฉันไม่ได้ตระหนักถึงนโยบายป่าไม้ เ'm not aware of forest policy

อธิบาย

การจัดการทรัพยากรป่าไม้ที่มีผลต่อชีวิตประจำวันของคุณหรือไม่? เs the

management of forest affecting your daily life?

ใช่

ไม่มี

ไม่

อธิบาย

คุณเห็นด้วยกับนโยบายของรัฐบาลในการปกป้องลุ่มน้ำ?

Do you agree with the policy of the Government to protect watershed?

เห็นด้วย

มีผู้ใดมีส่วนร่วมของท้องถิ่นในการจัดการป่าไม้? Is there any local involvement in Forest

management?

ให่

มีสมาชิกในครัวเรือนของคุณมีส่วนร่วมในกิจกรรมการอนุรักษ์ป่าไม้ไหม?

Is your household involved in any forest conservation activities? มี

โปรดระบุ_

้ คุณสังเกตเห็นการเปลี่ยนแปลงในความพร้อมของป่าที่ให้ผลิตผลภายใน $10\,$ าี?

Have you observed a change in the availability of forest produce within last 10 years?

ลดลง Decrease เพื่มขึ้น Increased

คุณสังเกตเห็นรายได้ที่เพิ่มขึ้นไหม ของคนที่มีส่วนร่วมในการจัดการเรื่องป่า?

ไม่มี

ไม่เห็นด้วย

ไม่เปลี่ยน ₀₀

change

ไม่มี

ใช่

ไม

ความคิดเห็นของท่านเกี่ยวกับการจัดการป่าไม้ในพื้นที่นี้คืออะไร?

Thank you for your co – operation/ ขอบคุณมากค่ะ

Appendix 4: Tourism Questionaires

B. นักท่องเที่ยว

Tourism



<u>ส่วนที่1 : คนในชุ*มชน* โปรดใส่เครื่องหมายลงในกล่อง</u>

<u>Part 1. Villagers</u> (*Mark the appropriate box*)

คุณคิดว่าอะไรที่ดึงดูดนักท่องเที่ยวในพื้นที่นี้ What in your opinion attracts tourists in this area?

ธรรมชาติ ป่าไม้ _{Natural forests} วัดใหม่ใหม่ _{New build Temple} สินค้าท้องถิ่น _{Local products} ระยะทางจากเมืองใหญ่ _{Distance}

from major cities อื่นอื่น

โปรดระบุ____

การปีนเขา เรือคายัค และอื่นอื่น

Local attractions (climbing, kayaking etc.)

นักท่องเที่ยวแบบไหนที่คุณคาดว่าจะมาเยี่ยมบ้านพระบาท What kind of tourist do you

expect will visit Ban Phrabat? คนในชุมชน _{Local people} นักท่องเที่ยวไทย _{Thai tourists} นักท่องเที่ยวที่ไม่ใช่คนไทย

Tourists from outside of Thailand คนรวย wealthy people นักท่องเที่ยวเชิงนิเวศ _{Eco tourists} ครอบครัวและเด็ก _{Families with} ^{children} กลุ่มคนหนุ่ม สาว _{Groups of young} people นักผจญภัย Individual adventurers อื่นอื่น

โปรดระบุ____

คุณคาดหวังความเปลี่ยนแปลงอะไรจากนักท่องเที่ยว?

What changes do you expect that the tourism in your area will give you?

รายได้เงินสด _{Cash income}

โอกาศทางอาชีพใหม่ใหม่ _{New job}

opportunities โครงสร้งพื้นฐานที่ดีกว่า Better infrastructure ชีวิตที่ดีกว่า Better living conditions (-)

อื่นอื่น โปรดระบุ,

การทำลายธรรมชาติ_{Nature} devastation

อาชญากรรม Criminality

วัทนะธรรมของชาวยุโรป

Strong impact of west culture

ครอบครัวคุณได้ประโยชน์จากนักท่องเที่ยวอย่างไร? How does your household benefit from

tourism?

ขายสินค้าพืชผล _{By selling crops} ขายผลไม้ _{By selling fruits} ขายสินค้าท้องถิ่น _{By selling local goods}

การขาย NTFPs _{By selling NTFPs} ขายสินค้าหัถกรรม _{By selling handicraft} ^{products} อื่นอื่น โปรดระบุ เตรียมที่อยู่ _{By} providing accommodation (-) ร้านอาหาร _{By} opening restaurant จัดทริป _{By} organizing trips การขนส่ง _{By} providing transport

Part 2. Tourists	(Mark the appropriate box)		
Mr	Mrs	Miss	
First name	Last name		

Age <20 30 - 4050 - 6020 - 30 40 - 50 >60 Are you international or domestic tourist? International Domestic Is this your first time traveling to Ban Phrabat? Yes No How do you travel? Traveling independently With a group (Friends, Family,.etc) How did you first learn about Ban Phrabat and its attractions? Visited Ban Phrabat before **Tourist guides** From Friends/Relatives Mass Media **Tourist Information Centre** Other, please specify_____ How long are you planning to stay in Ban Phrabat? < 3 days >7days 3-6 days Purpose for visit: Recreation Eco-tourism Health Education visit Business/Work **Relatives living in** Ban Phrabat Religious reason Shopping Passing through Culture Visit the temple Other (Please specify) Accommodation: Home stay Guest House Camping Family/Friends Hotel No accommodation Other, please specify

What is your opinion about the price setting in Ban Phrabat?

Expensive Affordable Neither Affordable Nor Expensive

Please rate what may you find attractive:

	Very	Attractive	Not	No
	attractive		attractive	opinion
Natural environment				
Long distance from a big city				
Ride a bicycle or mountain bike				
Walking / bushwalking / hiking / trekking				

Traditional food		
Traditional accomodation		
Traditional culture		
Visit temple		
Buy local original products		
View wildlife		
Other, please specify		

Pleace rank:

	Bad	Poor	Average	Good	Excellent
Facilities					
Safety/Security					
Service					
Hygiene					
Accomodation					
Cousine					
Courtesy					
Shopping					
Unspoiled nature					
Local people co-operation					
with tourists					
Local transportation					
availabilities					

How much money do you plan to spend during your visit to Ban Phrabat on the following items?

Accommodation.	Approx	THB
Transportation (bus ticket, taxi, etc.).	Approx	THB
Restaurants	Approx	THB
Food (not in restaurants)	Approx	THB
Souvenirs	Approx	THB
Local products	Approx	THB
Other shopping	Approx	THB
TOTAL	Approx	THB

How do you rate this destination Excellent Good

Average	
Poor	

	Comp satisfi	letely ed	Completely dissatisfied			l don't know
	1	2	3	4	5	
What is your overall satisfaction with your visit to this tourist destination?						

Thank you for your co – operation/ ขอบคุณมากค่ะ

Appendix 5: SSI Interviews

SSI: 1 RFD interview February 28th, 2011

We met with Mr.Manukit Surintipa, head of the Royal Forest Department for the Mae Lor Watershed. He explained that he works with the Department of Forestry as well as with people in the villages in the watershed, and that he has a good relation with the villagers.

Mr. Surintipa explained about the policy enforcement that the village committee can punish someone who cuts down trees without permission, and if they cannot do anything, they will ask the RFD to take action. It could also provide one or two warning to the people attending to cutting down trees before preventing the RFD. It may also become a matter for the police and the judicial system. Punishment may be given by through the courts or through the village committees. A way of punishment by the village committee may be social exclusion e.g. "Do not talk to this bad person" or "He will not be allowed to participate in some village festival".

By law all the forest in the watershed is conservation forest, but the actual designation of what is conservation forest and what is utility forest concerning community forest is left to the village committees. It is the duty of each village to know the boundaries of their community land and what is designated conservation and utility forest, respectively.

The reason for this arrangement is that the new Community Forestry Act has not yet been passed and so for now at least the government allows the villages a large degree of autonomy regarding forest policies.

According to law, people will have to gain permission from the government to convert forest into types of land, however, they often don't ask. Mr. Surintipa mentioned specifically the Khon Hmong as a tribe who sought to extend their land. He also said that last year, there were seven cases of people trying to extend their land without permission.

Mr. Surintipa said that the most requests are for permission to cut trees for timber in order to build houses or temples. The villagers are allowed to collect firewood without permission.

A question was asked about what would happen if the consensus of the village committee was to cut down trees, as they are the ones to give permission for the felling. Mr. Surintipa replied that the committee is not allowed to go against the law, even if there is a consensus.

The villagers are allowed to collect NTFPs without permission, but only for consumption. However, it is ok to sell "not so much". This is allowed as it is their livelihoods, and it is not controlled how much consumed, and how much is sold. The major NTFPs collected are mushrooms, herbs, bamboo and bamboo shoots (there is no rattan). Some people cultivate bamboo, but you are not allowed to take bamboo from the forest. Mr. Surintipa explained that it could be traced from where the bamboo had been taken, but if someone managed to get the bamboo to his house, then it could not be proven he had taken the bamboo illegally, and the bamboo was his. There are no official policies affecting the harvesting of NTFPs, this is left entirely to the individual gatherer.

There are no reforestation or fire prevention projects going on, but the villagers are educated on forest policy through various initiatives such as Children's Education Day, and the RFD officer will be present at village meetings if they wish for him to do so.

There is no physical demarcation between conservation and utility forest; sometimes big signs are positioned on the trees to define the boundaries.

Even though all the forest is designated as conservation forest, the amount of forest has been steadily decreasing.

Mr. Surintipa explained that the villagers in the watershed are allowed to fallow their lands for no more than seven years, but due to the intensive agriculture many fields are fallowed far less.

SSI 2: Interview with RFD in Chiang Mai, 11th of March 2011

RFD has been separated into RFD and the Department of National parks.

The RFD in Chiang Mai is responsible for about 12 million rai (23 forest reserves).

Forest zonation

- 1. C = conservation
- 2. E =economics
- 3. A = agriculture

In E and A, habitation and cultivation is allowed, but C is 'strictly' conservation. In recent years however, C has become inhabited with the hill tribes who have refused efforts to be relocated to lowlands in 1999.

About 700 people are jailed for forest offences in the Chiang Mai District. The RFD works closely with local people (conservative forest networks present in each village) and also provides alternative livelihoods to control forest degradation.

A document is given by RFD to households with less the 11 rai of land and they are not allowed to expand or sell these lands. The community forest law has not yet been passed mainly as a result of differences between RFD and NGO community (the government's stand is a 'no habitation within watershed' whiles the NGO thinks otherwise). In his frank opinion, the bill will never be passed!

SSI 3: Interview with Tabon officials

The total area of the Saluan administrative district is 1018.38km, consisting of 8 villages. There are 4 villages in the lower areas and another 4 villages in the upper area. The district has a total of 10 temples with the Phrabat Si Roy temple being the most popular.

Groups

-scouts

-housewives (8 groups)

-community development

-savings group

-elderly group

-HIV committee

14-18th March is the festival to 'water the footprint' in PSR. Villagers gather at night with water from the royal palace and walk to PSR to water 'footprint'.

Forest Management

In 2002, there was a meeting to manage forest after water dried out. This meeting was initiated by an RFD official who reasoned it was important to involve local people in the management of forest. There were noticeable results after 5 years which encouraged further collaboration.

Utility forest agreements are 'unofficial'. The Saluan acts only as a 'middleman' between RFD and local people (usually head men) to facilitate dialogue. Currently the office is working on the boarders of villages in the process leading to them getting community deeds. This they are doing by surveying and mapping household land and compiling these into total community land. Though individual deeds are preferred, the saluan has no authority to issue any form of deed. What they can however offer is a document showing exact boarders of surveyed household land to show 'ownership' (for now, that is 'good as gold').

Under the community deeds, landowners can only sell land to individuals from within their own communities. Community deeds program is a pilot programme which is yet to commerce.

Under its environmental strategies, the saluan, engages in forest management by providing funding for protection activities like fire belts creation and also funds the building of water dams in communities.

Prabat Si Roy has no electricity because getting electricity to the village requires cutting down about 18 rai of forest which the RFD is not willing to grant the permit for. The alternate of underground cables is expensive (6 million Bahts of which the temple has provided 1 million). The budget has however been sent to the central government and is still waiting approval for funding.

SSI 4: Headman, March 2nd 2011

Most young and old people stay at another village, and many are also away studying. Children and grandchildren are supposed to take care of the elders. The young people of the village are well educated.

The main income in the village comes from miang, but the young people have their own knowledge and don't wish to pick miang. The village doesn't have a school; the playing field is for a festival on February 12th.

Six kids go to the school in Sang Bayang (spelling?), where the school goes up to 6^{th} grade. The rest go to school in another village.

The young people who have graduated have good jobs in the city and may not come back to the village. The village used to have its own primary school, however it closed 22 years ago,

back before the concrete road was constructed. Maybe in the future, once the village is more developed, the young people will start coming back to the village. When asked directly, he said 'The young people will definitely come back, once the village becomes more developed'.

The main income for everybody in the village is from collecting miang. There are three families in the community, who do not own their own land; they work as laborers harvesting miang for others. The starting wage for an office job in Chiang Mai is about 6,500-7,000 Baht/month, while you can make more than 10,000 Baht/month in Phra Bat, and even more once the tourists really start coming here. The flowers alone sell for more than 1,000 Baht/day on weekends, and he frequently has to turn away restaurant customers during the weekends as well.

However, the income is unstable during the rainy season, because the road becomes difficult to navigate. Also, the income fluctuates, whereas an office job provides a stable income.

When the temple is in need of help, the villagers will volunteer. This was how the concrete road was built. Only in rare cases is it necessary for the temple to actually hire, as even skilled professionals from other villages or cities usually will volunteer their help.

There is a plan to build a reservoir, which will be larger than the current one. The temple has its own reservoir, as they use a lot of water during festivals and ceremonies. The plan for the new reservoir is quite advanced and the committee is working hard. The reservoir we saw yesterday (with Uncle Sa-Ngad) belongs to the temple, the new water tanks belong to the village, and the old water tanks belong to the temple. The area around the reservoirs is accessible; you are allowed to collect NTFPs there, but you are not allowed to cut trees.

The temple is being promoted by word-of-mouth and through websites done by people who honor and respect the temple.

There is a sewage tank for the toilets and such for every household, and when it's full they just call a truck to have it emptied. Water from the kitchen and cleaning goes into the stream if that is convenient, or it is just poured on the ground.

SS1: 5 Interview with the Headman's assistant

Member of the Agricultural Committee

Member of the Temple Management Committee

Member of the Village Committee

Member of the Forest Management Committee

In the past the villagers have always been the main supporters of the temple. There used to not be an abbot, and the villagers would ask monks to come to the temple. The present abbot has been here since he was a novice.

The abbot got ordained and wandered around, until he came to Phra Bat, where he stayed. Before he came, he had a dream of the footprints. The abbot used to clean and weed, which earned him great respect from the villagers.

The current expansion of the road is done by the village and the province, and is not related to the temple. Both water reservoirs belong to the village; they just let the temple use one of them.

There used to be a problem about water shortage, back when they had to get the water out of the stream. At festivals they let the temple use the water, and the villagers would have to keep water in big buckets to use during the festival days. Then they got a budget from the government to build a reservoir, and the villagers did the work themselves for the first reservoir, which was constructed in 1999. The expansion of the reservoir was done through donations made to the temple.

He serves as an advisor and middleman between the temple and the village. Whenever the temple or the village comes up with a new project, they will come to him for advice on how to best make this work between the two institutions. Back when there was only one reservoir, he was also in charge of scheduling the villagers' water usage. Before 1999 each household that wanted to collect water from the strea had to pay 2 Baht/faucet. Now they pay 40 Baht/faucet as a maintenance fee.

He grows vegetables for his own consumption and has a fishpond with catfish and tilapia. He also grows oranges, pineapples, sugarcane, pomelo, lychee, citrus, lime, miang, phlap, buay and different kinds of herbs, so there is virtually no need to go shopping. Tomorrow he has a

meeting with the coffee growers' committee, because they are looking into starting their coffee production up again. He has over 2000 coffee trees.

The only thing he lacks is meat, which he has to buy. He can't raise chickens as his dogs would kill them.

Many, many years ago the conservation laws were passed. The RFD has no real jurisdiction here, the village committee decides where the zones for where you can't go at all, and where you are allowed to collect NTFPs.

If anybody came here and wanted to build a house, they would have to ask permission from the village committee. They would only be allowed to take enough timber to build the house. People from other villages are only allowed to collect mushrooms from the community forest.

A bit over 10 people meet once a month for the temple management committee. They manage the upcoming ceremonies; it takes 4-5 days to a week to prepare for a festival. If you are absent from a meeting, you either have to pay someone else to come, or you get fined (unless you are sick or have another good reason). They divide the labor between them in the committee in the same way other committees are set up.

The development of the temple spurred the villagers to see new opportunities for income; it wasn't the temple that deliberately made these jobs. The villagers saw all the expensive cars coming to the temple and tried to figure out ways to get the rich owners of the fancy cars to spend their money in the village. This created more primary and secondary income.

Working in the market is easier, because you get a much more stable income every day; with miang they sell a lot at one time and get a large amount of money just the once.

Whenever he started selling a new product others would follow. He went to a conference and learned about pickling and packaging buoy, which he was the first to do [interestingly enough, the headman's wife also claimed that she was the one who started this particular venture up].

Now, he has many different crops in his orchards and his income is far better, but he is still in debt. This is primarily due to paying for his daughters' education.

It was difficult for them, when they first started out here, but now things are working out well. They also learned how to graft the phlap at a conference. There is a problem with corruption from the agricultural department: In 1997 the department got baby coffee plants for them for 3 Baht, but the farmers had to pay 5 Baht for them. Then the department was supposed to help them with the coffee production, eg. helping them find middlemen etc., but the department just abandoned them [this is the same problem that caused Ar-Ree to go bankrupt, but she is also wishing to start up her coffee production again].

He has two daughters. All the young people leave to go to the city; his first daughter will visit, but she is not coming back to the village. His second daughter has promised to come back and help develop the city, once she has completed her education.

The increase they have experienced in income has allowed him to spend a lot of money on his daughters. If it was just his wife and him, they would have a lot of savings by now, but they have been needing an income of 1000 Bahts/day to pay for the daughters' tuitions.

They collect miang from early morning, and then steam the leaves until 1-2 in the morning. Last year he harvested 7 tons of phlap, and he has over 1000 phlap trees. He has to collect miang every day during the season, and it is hard work.

The young people are forgetting the way to collect miang (and they are not really interested in learning it, either), so it is difficult for him to hire somebody to do it for him. With phlap and other fruits and produce he can easily hire someone.

One of the reasons he is changing his crops is to make it easier for his daughter to farm the land. Other people are doing the same thing, as they believe this will help bring the young people back.

He says: The young people are welcome to go out into the world, use their knowledge, and eventually they will fail and come back home.

He is 59 years old and moved to Phra Bat in 1976

The dusty road was constructed in 1970

Phra Bat became its own village (Moo 6) in 1979

SSI: 6 Interview with Buddhist monk from the temple

Monks would come to the footprints in order to get merit, before King IV was king, but they would not stay. The monks didn't start to live here until King V was made king in 1829 [when I try to check this with at what points Thai monarchs reigned, it doesn't correlate at all].

When the current abbot was 44 years old (in 1993) he started to rebuild the temple with the footprints. In 1998 the next temple was finished. Then they built residences for the monks.

The Thai people are very faithful and religion is very important to them. Both local people and people from other places will volunteer to work for the temple. Many people come to worship the footprints, and there are many who give large donations. Thus, all the work done by the temple is financed through donations.

It cost 18 million Baht to make the concrete road, which was all paid for by the temple. It cost 45 million Baht to build the new temple, and 700,000 Baht for the current construction work being done in the parking lot. The parking lot itself cost 300,000 Baht in 2003.

The temple land is 74 rais, and they have used it all now, so there is no more space to build new buildings.

Currently they are working on 'The Golden Home', a guest house with 28 rooms where the faithful pilgrims can spend the night.

The temple is working on getting electricity, which will make it easier for the village to get electricity, but they would still be two separate entities in this matter, just like they each have their own water source.

The RFD will sometimes ask the abbot to make sure the headman of the village follows the rules. The abbot may also join the village committee meetings. The villagers know that it is a good idea to listen to the abbot, as he is very influential and has good connections.

The temple will let anybody pick the miang and the phlap. You should, however, ask for permission.

As part of the villagers' respect for the temple, they have to be courteous to the tourists and make sure, that the temple area is clean and well-maintained. And also that the forest appears

pristine and beautiful. The temple serves both as a catalyst for developing the village as well as the spiritual center for the villagers.

Timeline:

Footprints were found while Chiang Mai was still the Lanna Kingdom (the Lanna Kingdom ended in 1774).

1928 – The consort of King V worshipped at the footprints, and asked the people to make a building beside the footprints where people could worship.

1929 – The famous Lanna monk Pra Kruba Sriwichai built the building that covers the footprints

1969/70 Dirt road is established

1990 Compromise between conservation and utility forest is reached

1990's The concrete road is made

1993 The temple is renovated

1997 The second temple is built

2000 The market is established

SSI: 8 Interview with the land department, March 10th

Important: In my opinion this was an interview that was terribly translated, so if my notes don't make a lot of sense to you, it is probably because it was very difficult to understand what was going on.

In order to get a title deed to your land, you have to already have some official recognition of your claim, ie to get a title deed, you must already have one. However, at times they are able to issue title deeds as exceptions.

Villagers, who lived in the area before the conservation laws were put into practice, can get a document for their land. In 1982 the land law was passed, which stated that if you owned a plot of land, you had to inform the land department. After informing the land department, you got a document, which after some years developed into a chanote.

Most of the land in the watershed is conservation forest, and most of the villagers do not have the document, they should have gotten in 1982. Thus, the land department cannot issue documents to them.

Phra Bat Si Roy has a big exception area (the temple lands). The temple has the right to get a chanote to its lands, and the land department needs to make sure that any villager's claim to the land does not overlap with temple land.

He thinks the solution to the people not being able to get a title deed to their land, lies with the possibility of the community applying for a collective community title deed, which they can as long as the village was settled before the conservation laws were passed. The option of getting a community title deed is not passed as a law, but as an 'order' from the prime minister. [effectively, this means that a community title deed is not very secure, as its validity only goes as long as the government says so]

The village has to apply as a group for the community title deed, which would cover all people in the community without other documents. The process will be coordinated with the RFD. The community title deed is <u>only</u> for people living in the community, and it can cover a patchwork of plots, ie it doesn't have to include all the community land, just the land owned by the document-less villagers.

An important aspect of the community title deed is, that once your land is covered by this, you cannot ever sell it; however, it can be inherited.

Once the application for a community title deed has been filed, different aspects of ownership and the community as a whole has to be investigated. This covers what the village's plan for the land is, and how well the cooperation between the government and the village committee works. There are no restrictions as to what kinds of land can be included in a community deed. The ease of getting a community title deed is to a great extent determined by the strength of the community.

Community title deeds are only for livelihoods; deeds for community forests are an entirely different procedure.

Of all the villages in the watershed, only Phra Bat Si Roy is in the process of getting chanotes, which is primarily due to the temple.

SSI 8: Interviews with Mrs. Amphan Manee, Former Head of the Housewives' Committee, Wife of the Headman, March 2nd, 2011.

Mr. xxx has been the headman of Phra Bat since 1984. Every 4-5 years his work is assessed, and if he is doing a good job, he can stay until he is 60.

Mrs. Manee has been living in Phra Bat for 43 years. She was born in San Bayang village, but when she was 11 she started helping with harvesting the land of her parents and grandparents, whose lands were in the Phra Bat area. About 30 people would live together in a big bamboo hut for 1-2 months to collect miang, and then they would go back home. This pattern was repeated 4-5 times a year. Back then many young people would come here to pick miang. Finally, she moved here permanently in 1980.

In 1970 the dust road was established and in the 1990's the concrete road was built. They lay concrete on the parts of the road that were hardest to navigate first.

She is the oldest of five siblings, and she inherited only 15 rais of land. The next two each got over 50 rais of land, and the last two got good educations and in return received no land. The reason she got so little, is because as the big sister, she is supposed to make sacrifices for her younger siblings. Neither she nor the headman has any ownership documents for their land, which they cultivate together.

The tourists started arriving around 1989, but with the improvement of the road more and more tourists come. She went to a lot of festivals and gatherings to learn about herbs and how to package them, and she got together with four other ladies and started selling NTFP and orchard products to the tourists. She was the driving force at starting this initiative. At that time there was no Housewives' Committee, but when the other women saw that the five ladies were making a good income, they also wanted to join. So she established the Housewives'Committee, of which she has been the head for more than 20 years, and later the market in 2000. She resigned as Head of the Housewives' Committee last month (February 2011) because she felt she was getting too old.

As Head of the Housewives' Committee she has also initiated the pickling of buay. Buay is a kind of plum, which they grow, but the middlemen would give them too low prices. In order to counter the poor prices, she set up a system to pickle the buay, so it could be conserved and sold once the price was good. Currently, they have an application being looked at by the government to get funding for buying equipment to make dried fruits (orchard products).

The four footprints of the Buddha serve as a spiritual center for lay Buddhists, and give the village women opportunity to sell flowers for the worship. The development of the temple has created more income opportunities for the women, as very few used to work with anything but collecting miang leaves.

However, the economic improvements are also what have allowed people to send their children to school and college. The migration by the young people started around 1997 [which coincides with the renovation of the temple (1993) and the building of the new temple (1997)]. Her generation didn't have money for those kinds of opportunities.

When asked if she would like to have the possibility to extend her land, allowing her to farm more, she replied that she would not want to expand her land even if she could. She feels very responsible for the forest and wants to conserve it; it is their life.

She feels they have received great economic benefits from the temple, but also social benefits as the interaction between nearby villages, Chiang Mai and even government institutions are far greater due to the development of the temple.

In her opinion a lot of things hinges on the quality of the road. When it is wet, the road is slippery and the tourists do not come. And she also believes that a better road would make the young people want to come back. Some of the young people work as vendors in the city, and if Phra Bat become more developed, maybe they will come back to open a shop here instead. However, even though the price for miang is good, the young people are not very skilled at collecting miang.

Overall, she feels the development of the temple has allowed for both economic and spiritual improvement of the villagers' lives.

Appendix 6 Soil pH and EC

Soil PH

Soil PH	4.5-5	5.1-5.5	5.6-6	6.1-6.5	6.6-7.3	7.4-7.8	7.9-8.4	8.5-9	>9
Soil quality	Very strongly acid	Strongly acid	Moderately acid	Slightly acid	Neutral	Mildly alkaline	Moderately alkaline	Stronglyy alkaline	Very strongly y alkaline

Source: (Hazelton et al 2007)

Soil EC

EC 1:5 (ds/m)	Soil quality
< 0.07	Infertile soil with low electric conductivity
0.07-0.23	Most fertile soil
>0.23	Fertilizer bands, saline soil

Source: (Hazelton et al, 2007)
Appendix 7: Synopsis

What are the effects of centralized forest policy and tourism on household strategies in Ban Phrabat and how are they related to de-agrarianization?



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1. Introduction

1.2 Background

Our study will be conducted in the village of Ban Phrabat Si Roy (BP), Chiang Mai Province in Thailand. The village was founded more than half a century ago and has more than doubled in terms of number of households in that time, from 16 to 39 households. It is mainly inhabited by the Kon

Muang (ethnic Thais). BP is situated at 1000m above sea level, fairly high in the Mae Lor Watershed, by a perennial water stream and a road (Mingtipol *et al.*, 2011).

The cultivated land is mainly located along the water stream and the road and consists of approximately equal parts of forest utilized for orchards (21%) and un-forested lands used for swidden cultivation (19%). The remaining land (60%) is designated as conservation forest. The area to the east and west, as well as about 1 km north and 0.5 km south of the village is categorized as Class 2, in which agricultural activities must be avoided and forest and mining activities must be strictly controlled. The land further north and south is Class 1A, in which non-forested areas must be reforested, and forested areas must be maintained as such. The actual use of the land and the official categorization obviously represent opposing interests (Mingtipol *et al.*, 2011).

1.3 Forest policies

Thailand suffered significant loss of its forest cover from 1961 to 1995; going from 53.3% of the total forested area to 25.6% (Bugna and Rambaldi, 2001). There has however been conflicting figures in the current forest estimates with Hares (2009) estimating forest cover as 28.4% (FAO estimate) and the Royal Forestry Department (RFD) of Thailand putting it at 33%. The northern part of Thailand however is estimated to have a forest cover of 56%. The Thailand office of Environmental Policy and Planning implemented the Policy and Prospective Plan for Enhancement and Conservation of National Environmental Quality. The program is for the period 1997-2016 and aims at reforesting 50% of Thailand lands; 30% for conserved areas and 20% for productive areas (Bugna and Rambaldi, 2001).

Harvesting timber in natural forests was made illegal in 1989 and collecting Non Timber Forest Products (NTFPs) from conserved and protected forest is also not allowed (Vantomme *et al.*, 2002). This restricts the availability of food/income to many of the hill tribes who rely a great deal on the gathering of non-timber forest products (NTFPs) primarily for own consumption (sometimes for selling on the market). Delang (2006a) emphasizes the importance of NTFPs in the results of investigating a Karen village which showed about 80% of the food plants in their diet was from the forest.

According to Gypmantasiri and Amaruekachoke (1993) land use regulations in the Mae Lor Watershed stipulate that 'the area designated for agriculture cannot be extended and farms will revert to community land if uncultivated for 3 consecutive years.

1.4 Livelihood strategies

Livelihood strategies in BP include agro-forestry and gathering NTFPs (Mingtipol *et al.*, 2011). The cropping system is swidden based (Ibid), and is likely less efficient due to the reduced fallow period (Deland, 2006a). The short fallow was imposed to limit the area of cultivated land but shortening the fallow period results in increasing loss of soil nutrients (Bruun *et al.*, 2009). It is therefore likely that since outlawing swiddening in 1989, there is a diminishing role played by crops harvested from such farms in households (Delang, 2006b). The orchard west of the village (Mingtipol *et al.*, 2011) may serve a dual purpose: 1) it provides an income from the fruits harvested there, but also 2) it keeps the land from being reverted to community land as per the rule that land must be cultivated at least every third year (Gypmantasiri and Amaruekachoke, 1993).

The Buddhist temple recently constructed in BP attracts local Thai tourists. Tourism provides villagers with income earning opportunities; sale of NTFPs and other local crafts (souvenirs) at the market near the temple (Mingtipol *et al.*, 2011).

Waged labor outside BP, whether seasonal or permanent, 'may' contribute to household incomes as well. There may also be income from illegal usage of forest resources, from logging, illegal gathering of NTFPs or growing crops outside the designated area.

1.5 De-agrarianization

The process of de-agrarianization is the movement of labor from agriculture to other types of income, and it is influenced by push and pull factors. Push factors include the obstacles imposed on rural agriculture by forest policies, land scarcity, high cost of inputs and the amount of work it takes to cultivate sloping forest compared with the income made from this. Pull factors include less physical labor, higher income, and a Westernized standard of living. As agriculture becomes less attractive, households hybridize their strategies and gradually lessen their emphasis on agriculture, thus resulting in de-agrarianization.

Through our research framework (Appendix 5.4), we intend to gain an understanding of the factors impacting de-agrarianization in BP, in particular how and to what extent forest policies and income from tourism influence the diversification of livelihood strategies. Factors investigated will include land tenure and access; identification of priority household NTFPs, migration trends and local forest

management practices. We also aim to estimate the income from non-local sources, such as remittances and waged labor.

2. Research questions

In answering our research problem, we have developed two main research questions and several sub-questions with which we will be working.

2.1 Problem formulation

What are the effects of forest policy and tourism on livelihood strategies and how do they relate to de-agrarianization?

2.2 Main research questions

- I. How does forest policy impact livelihood strategies in BP?
- II. How does tourism impact livelihood strategies in BP?

2.3 Sub research questions

- 1. In what way is official and unofficial policy framework related to access and tenure of utility and conservation forest?
- 2. Are local people involved and encouraged to participate in forest management?
- 3. How do local people regard forest legislation?
- 4. What constraints does forest policy have on agricultural practices?
- 5. What is the level of dependency of locals on local resources?
- 6. Which tourism attractions are available in the area?
- 7. What income opportunities does local tourism provide?
- 8. How many people use opportunities provided by tourism to hybridize the household strategies?

Ш

9. What is being done to promote BP as a tourist attraction?

3. Methodology

The following methods have been proposed to be used to collect data necessary to answer our problem formulation. Detail of all methods proposed can be found in the appendix.

3.1 Semi-structured interviews

Semi-structured interviews with informants provide insight on issues related to our subject especially issues related to the enforcement of forest policies. Respondent include the Royal Forestry

Department (RFD) staff, the village headman, resource user groups, market women and other key informants. We have chosen the semi-structured approach because according to Denscombe (2003), they allow the interviewee to develop ideas and speak widely within a set frame of reference. Prior to each interview, we will prepare a guide highlighting issues of importance, which will allow freedom for elaboration and exploration (Appendix 1).

3.2 Questionnaires

To understand household composition and livelihood strategies, we will try to indentify resource use, migration trends, income distribution through a questionnaire distributed to the households. Households will be stratified for random sampling based on the parameters (i.e. size of household, size of farmlands etc) of most economical importance (this is currently unknown and will be obtained from interviewing the headman and key informants).

The beauty of questionnaires, Denscombe (2003) argues, is the subsequent ability to analyse the data. Specifically it is the ability of standardization that separates the questionnaire from qualitative assessment. Thus, our purpose with the interviews is to obtain a set of standardized answers, which can be analyzed to get an overview of our field (Appendix 2).

3.3 Soil analysis

In order to assess the level of nutrient availability soil samplings will be carried out. We will choose three locations, which are representative of agricultural land, utility and conservation forest, and compare the soil quality and collect composite samples from each location, in order to compare the soil quality. This allows us to understand how soil quality differs in the respective areas, and if there it poses any constraints on agricultural production. Basic soil chemical and physical properties such as: pH, texture and organic matter will be examined to determine the soil type. Soil samples will be taken home for precise laboratory analyses (Appendix 3).

3.4 Focus group discussion

The group discussion will involve six to eight representative household heads who are permanent residents of the village. These people will be randomly selected through answers provided from the questionnaire. The main discussion point will be which major constraints the villagers feel the forest policy imposes on agriculture and how this relates to de-agrarianization. The duration of the discussion will last a maximum of two hours (Appendix 4).

3.5 Forest resource assessment

According to the forest policy the forest near BP is divided into utility and conservation forest. In order to investigate the extent to which the villagers adhere to the rules imposed in the two types of

forest, we will conduct a forest resource assessment (FRA). Two randomly selected plots in each forest will be studied, and the overall location of the plots will be chosen with help by the community mapping and the RFD. This will enable us to determine the degree of disturbance between the protected and utility forests, through measurements of canopy structure (crown coverage, basal area, height) and composition (climax and pioneer species, herbal/shrubs/trees layer) (Appendix 5).

3.6 Mapping and GPS

GPS will be an ubiquitous tool for several activities; for tracing the transect walks in the first days, the positioning of the households, cultivated fields, homegardens, location of important NTFP, and other relevant information provided from the community mapping. It will also be used during the FRA in utility and conservation forest for the location of the sampling plots. The information collected will be represented on maps using Mapsource.

3.7 Transect Walks

Transect walks will be used to describe and show distribution of resources, features, landscape, main land uses and changes occurring (along a given transect). The 'transects' will be identified in consultation with key informants, who have a good knowledge of the community structure and land forms. The transect walks are aimed at gaining an overview of the community and its' resources and will enable us to gather baseline information for further research. GPS tools will be employed to mark significant observations along the 'transect'. Information from transect walks will also be used as a contributory tool in site selection for Forest Resource Assessment, soil analysis and a complimentary tool in community mapping and the seasonal calendar. The transect walk will be diagrammed on paper with markers to show features significant to our study.

3.8 Community Mapping

Four groups of young, old, males and females will be established through stratification. Each group will be asked to draw a map of their village. We will ask them to include the things they feel are of significance and once they have concluded the drawing, we will ask them to add things we feel are of importance, with a different colored marker, if they have left them out. The outcome is twofold. With the information provided we will get an overview of the village in terms of sites of relevance and therefore importance, which will allow us to understand the priorities underlying the livelihood strategies of each group. By dividing the inhabitants of the village into different groups the answers provided will suggest what the different groups determine to be important. These community maps can then be compared and related to the aerial photos we were provided with alongside our GPS mapping, and also compared to the boundaries defined by the RFD.

3.9 Ranking exercise

To determine the relational use of the resources available to the villagers and the activities required to obtain said resources we will do ranking exercises with the same stratification strategy used in the community mapping. In relation to livelihood strategies the ranking exercise will illustrate the importance of an activity, rather than time spent doing the activity, hence the answers provided suggest what is perceived as important. The data found will be correlated with information found, from the community mapping and the seasonal calendar.

3.10 Seasonal calendar

Seasonal calendars will show the distribution of important seasonal events throughout the year. The purpose is of the seasonal calendar to determine seasonal fluctuations in migration, forest activities and tourism, and to what these fluctuations are related. The calendar will be made by the four previously defined groups as well as key informants representing other groups such as NTFP gatherers. Hence, the calendar will be comprised using several activities.

3.11 Timeline

The purpose of the timeline is to show the changes that have occurred in the village. It is helpful in identifying important past events (land reforms, forest felling, policies, etc) (Conroy, 2002) Elders provide details on how they perceive past events which provide the background setting for interpreting the impact of these on the investigated perameters. The timeline will include changes in land use, soil fertility, livelihoods, migration trends, local opinions and dependency on forest resources.

The drawing of the timeline will be conducted in the aforementioned groups. Information from this timeline can be triangulated with data from the FRA to investigate a potential relationship between resource dependency and resource state.

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5 Appendices

Appendix 1: Semi-Structured interview Guide

I. SSI- Guide for the RFD (Royal Forest Department)
Name of the interviewer: ______ Date: _____

- 1. What are the forest policy frameworks with regard to access and tenure of the forest resources by the local people?
- 2. Does the forest policy allow the local people to utilize the conserved forest?
- 3. Does the RFD promote forest resource management programs and initiative in the village?
- 4. How is forest policy upheld in conservation forest?
- 5. What sanctions are applied if laws are not respected?
- 6. How has forest cover changed in BP over time?
- 7. Do you have any questions or comments?

II. Interview Guide for Key informants (Resource management group)

Name of the interviewer: _____

Location _____ Date: _____

- 1. What are the forest management programs and initiatives in the village?
- 2. Are local people involved in official forest management activities?
- 3. How have you traditionally handled forest management?
- 4. How do you solve problems regarding forest management now?
- 5. What are the major benefits gained from the conservation and utility forests?
- 6. How does the forest policy affect agricultural practices in this village?
- 7. What are the on-farm and off-farm incomes of the villagers?
- 8. How much time do you spend harvesting and collecting NTFPs?
- 9. Do you have any questions or comments?

Thank you!!

III. SSI-Guide for Traditional leaders

Name of the interviewer: _____

- 1. What are the traditions and customs for forest management in the village?
- 2. Are there any forest management programs and initiatives in the village?
- 3. Do the local people gain benefits from the conservation and utility forest?
- 4. Has it always been like this?
- 5. How does the forest policy affect agricultural practices in the village?
- 6. Do you have any questions or comments?

IV. SSI-Guide for Resource users

Name of the interviewer: _	

Location ______ Date: _____

- 1. Are there any forest management programs and initiatives in the village?
- 2. Are you involved in official forest management activities?
- 3. How do you solve problems regarding forest management?
- 4. What are the major benefits from the conservation and the utility forest?
- 5. How does the forest policy affect your agricultural practices?
- 6. How do you practice shifting cultivation?
- 7. How is the soil quality of your land?
- 8. What are your on-farm and off-farm incomes?
- 9. How much time do you spend on harvesting and collecting NTFPs?
- 10. Do you have any questions or comments?

V. SSI-Guide for household head

Name of the interviewer: ______ Date: _____

- 1. What are the main livelihood activities of your household?
- 2. What are the main sources of income for your household?
- 3. What job opportunities both inside and outside the village are available for the household members?
- 4. How many of the household members are engaged in on-farm and off-farm activities?
- 5. What major changes have occurred in your household within for the last 10 years? (Eg. household composition, migration and land use)
- 6. What are the main reasons for these changes?
- 7. Does the forest policy contribute to such changes?
- 8. Do you have any questions or comments?

Tourism

I. Interview Guide for Key informants /Villagers

Name of the interviewer: _____

Location _____ Date: _____

- 1. What are the major tourist attractions in the village?
- 2. Who visits these tourist attractions?
- 3. How many people many people work with tourism, and how often do they do it?
- 4. When is the peak season for tourism in this area?
- 5. What are the benefits of tourism activities for the villagers?
- 6. Would you prefer tourism over other work?
- 7. Do you have any questions or comments?

II. Interview Guide for Key informants (Temple management group)

Name of the interviewer: _____

Location ______ Date: _____

- 1. When was the temple built? And by who?
- 2. Who visits the temple? And for what reasons?
- 3. Do you know of any initiatives taken to attract more tourists? Local, regional, international?
- 4. How many villagers are employed by the temple?
- 5. What do the villagers gain from the temple?
- 6. What job opportunities have been created for the villagers by the influx of tourists?
- 7. Do you have any questions comments?

III. SSI-Guide for Market Women

Name of the interviewer:

Location _____ Date: _____

- 1. How many people work in the market?
- 2. How much time do you spend working in the market?
- 3. Who are your main costumers?
- 4. What products do you sell? Types, quantities,
- 5. Why do you sell your products next to the temple?
- 6. Would you prefer your job over other jobs?
- 7. Do you have any questions or comments?

Appendix 2: Questionnaires

Household Questionnaire

GPS code: ______ Address/House No._____

A. Household characteristics

Part 1. Personal profile of respondent (<i>Mark the appropriate box</i>)						
Mr	Mrs	Miss				
First name	Last name					
Age						
<20	30 - 40	50 - 60				
20 – 30	40 – 50	>60				
Status in family						
Head of the household						
Other, please specify						
Highest level of education completed	1					
Primary/Elementary	Secondary/High	University				
School	School					
Birth place						
Ban Phrabat						
Another town/village in Mae	Lor valley					
Another town/village within (Chiang Mai province					
Another town/village outside	Another town/village outside Chiang Mai province					
Other, please specify						

Settlement period in the village

<5 years	5-10 years	10-15 years	>15 years
1	,	1	

Occupation ranking:

Main occupation	Secondary occupation	Tertiary occupation
	Main occupation	Main occupation Secondary occupation Image: Secondary occupation Image: Secondary occupation Image: Secondary occupation

Part 2. Household profile

	Males	Females
No. of family member(s)		
No. of children ≤18 years		
No. of adults >18 years		
No. of family member(s) contributing to household income		
No. of family members with education:		
P – primary, S – secondary, U – university		
Please put the letter next to the number ex. 2P		

Rank your major sources of income:

Type of income	Major	Secondary	Tertiary
Sale of cash crops			
Sale of timber forest products			

Sale of NTFPs		
Sale of livestock		
Sale of fruit crops		
Sale of handicraft products		
Merchant		
Remittances		
Work for hire		
Own business		
Social welfare		
Other, please specify		

Fill out the pie chart by answering the following questions:

Example:

с

N

м

How much of your consumption is covered by crops (C) that you produce? How much of your consumption is covered by NTFPs (N) the household collect? How much of what you consume is bought on the market (M)?



Part 3. Land and tenure



Do you have any papers to any agricultural land in Ban Phrabat? Yes No

Do you have any papers to any agricultural land outside Ban Phrabat? Yes No

Do you have access (but not ownership) to the land that you can farm? Yes No

How did you get land? Bought it Given by the Government

Inherited
Other, please specify_____

What is the size of your land?

<10 rai	11 – 15 rai	16 – 20 rai	>20 rai
Would farming be a mor	e attractive option for you id	l you had papers to the lar	nd you farm?

Yes

No

Part 4. Agriculture (*Mark the appropriate box*)

Number of cultivated fields _____ Number of fallow fields _____ Number of years a field is fallowed _____ Number of household member(s) who work on the farm _____

Type of farming

su	h	sis	te	n	ce
su	D .	212	ιe		ue

commercial

both

What agriculture products do you produce and for what purpose?

Products	Own use	Sale	Both	Fodder
Hill rice				
Wet rice				
Vegetables				
Plums				
Pomelo				
Pear				
Litchi				
Fish				
pigs				
chickens				
Other, please specify				

Which agro-inputs do you use in farming?

Pesticides	Fertilizers	Machinery
Organic waste	Animals feeds	None of these
Others, please specify		

<u>Part 5 . Use of forest</u> (*Mark the appropriate box*)

How has your access to natural resources changed over time?

increase	decrease	no change
How is the ferrest important to	ver 2 (Diek ene)	
How is the forest important to	you? (PICK ONE)	
Collect forest products	Farmin	g
Controls erosion	Tourisn	n
Others, please specify_		

Which forest products do you collect and how often?

	Everyday	>3 times a week	<3 times a week
Firewood			
Charcoal			
Timber			
Raw material			
Materials for			
construction			
Wild animals			
Medicinal plants			
Mushrooms			
Vegetables			
Fruits			
Miang			
Plap			
Honey			
Other, please specify			

Is the collection of forest products divided between household members? Yes No

Do you need a permit to collect NTFPs?

Yes

No

Are you/your household involved in any forest conservation activities?

Yes

No

Part 6. Market

(*Mark the appropriate box*)

Where do you sell your products?	
In the village	The market near the temple
In a neighboring village	Through government agencies
In the Chiang Mai market	Road side stalls
Others, please specify	
Who buys your products?	
Farmers organization	Local people
Tourists who come to the village	Neighboring villagers
What is the main constrain in selling your products?	
Accessibility (lack of roads etc.)	Transportation
No buyers for products	Too low price
Distance (too far from the market)	Other, please specify
Which household members sell products?	
Household head	Men
Women	Children

Part 7. Migration

(*Mark the appropriate box*)

Do any household members migrate from the village and why?

	Males	Females	
No. of household member(s) that left the			
village			
Number of household member(s) who work			
outside but live in Ban Phrabat:			
Reasons for migration	Permanent	Seasonal	Daily
Labor			
Marriage			
School			

Do you find work outside the village more attractive?

Yes

No

Did you encourage or were you encouraged to take a job outside Ban Phrabat?

Yes	Ν	lo
Are any of the household membe Yes	rs planning on finding a job (N	outside the village? Io
What is your job preference? Farm your own land Sell NTFPs/handicraft Work outside the village Other, please specify		
Part 8. Forest policy (Mark the appropriate box)	
Are you aware of the forest policies	regarding the forest near Ban F	Phrabat?
Yes	Ν	lo
In what way do forest policies impac	t village economy?	
Positive	Negative	No impact
Elaborate		
Is there any local involvement in Fore	est management?	
Yes No		
Is your household involved in any Yes	forest conservation activitie	es? Io
Please specify		
Is the management of forests affection	ng your daily life?	
Yes Elaborate	Ν	lo

Do you agree with the policy of the Yes	e Government to protect the v	vatershed? No
Have you observed a change in the	e availability of forest produce	within last 10 years?
Decrease	Increase	No change
Have you observed a change in inc	come generation of the people	who are involved in Forest Management?
Decrease	Increase	No change
Part 9. Tourism (What in your opinion attracts to Wild nature Newly build temple Local products Other, please specify	Mark the appropriate bo ourists to this area?	ox) Distance from big city Local attractions (climbing, kayaking etc.)
Which kinds of tourists visit Bar Local people (May Lor w Tourists (Chiang Mai) Others, please specify What changes do you expect th	n Phrabat? ratershed) at the tourism in your area	Tourists (Thailand) Foreign tourists will entail?
Cash income New job opportunities Better infrastructure Better living conditions	, ,	Nature devastation Crime Strong impact of western culture

Others, please specify_____

(\mathscr{M} Mark the appropriate box)

How can your household benefit from tourism?	
By selling crops	By providing accommodation
By selling fruits	By opening restaurant
By selling local goods	By organizing trips
By selling NTFPs	By providing transportation
By selling handicraft products	
Others, please specify	

Thank you for your co - operation

Tourist Questionnaire

Mr Mrs Miss First name Last name Age <20 50 - 60 30 – 40 20 - 30 40 - 50 >60 Are you an international or domestic tourist? International Domestic Is this your first time traveling to Ban Phrabat? Yes No How did you travel alone or with a group? Traveling independently With a group (Friends, Family, etc.) How did you first learn about Ban Phrabat and its attractions? Visited Ban Phrabat before **Tourist guides** From friends/relatives Mass media Tourist information centre Other, please specify_____ How long are you planning to stay in Ban Phrabat? >7days < 3 days 3-6 days

Purpose of visit:		
Recreation	Eco-tourism	Health
Educational visit	Business/Work	Relatives living in
Shopping	Religious reasons	Ban Phrabat
Passing through	Culture	Visiting the temple
Other (Please specify)		
Accommodation:		
Home stay	Guest House	Camping
Hotel	Family/Friends	No accommodation
Other, please specify		

What is your opinion about the price setting in Ban Phrabat?

Expensive Affordable

Cheap

Please rate what you find attractive in Ban Phrabat:

	Very	Attractive	Not	No
	attractive		attractive	opinion
Natural environment				
Secludedness				
Biking				
Walking / bushwalking / hiking / trekking				
Traditional food				
Traditional accommodation				
Traditional culture				
Visit temple				
Buy local original products				
View wildlife				
Other, please specify				

Please rank:

	Bad	Poor	Average	Good	Excellent
Facilities					
Safety/Security					
Service					
Hygiene					
Accommodation					
Cuisine					
Courtesy					

Shopping			
Unspoiled nature			
Local people friendliness			
Local transportation			
availabilities			

How much money do you plan on spending during your visit to Ban Phrabat on the following?

Accommodation	Approx	THB
Transportation (bus ticket, taxi, etc.)	Approx	THB
Restaurants	Approx	THB
Food (not in restaurants)	Approx	THB
Souvenirs	Approx	THB
Local products	Approx	THB
Other shopping	Approx	THB
TOTAL		THB

How do you rate this destination?

Excellent Good Average Poor

	Completely satisfied dissatisfied			fied	l don't know	
	1	2	3	4	5	
What is your overall satisfaction with						
your visit to this tourist destination?						

Appendix

3: Soil sampling

Soil samples will be collected from three sites in BP:

1.	Agricultural fields

2. Conservation forest

3. Utility forest

Soil composites will be analyzed for the following soil parameters:

•	Soil organic matter
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• Soil pH

• Soil nutrients: N, P, K

Soil samples will be collected at 30cm depth at several evenly distributed locations in the different sites into a container from which a 500g composite sample will be collected (together with a replica as back up) (SLUSE course material, 2011). Information obtained from the soil analyses from sites will provide information to show potential variations between sites and allow us to triangulate with information on forest use and agricultural practices.

Appendix 4: Checklist for focus group discussion

Introductions

- Introduce yourself and your team members
- Clearly explain the purpose of the discussion
- Let the participants introduce themselves

Discussion

- The major agricultural activities in the village
- The land available for agricultural activities

- Type of land ownership
- The importance of the forest in the village
- Access to forest resources
- Forest policy in the village
- Constraints of forest policy on agriculture
- Duration of fallow period
- Soil fertility status
- Number of people working with on-farm and off-farm activities
- Major reasons for villagers leaving the agricultural sector

Appendix 5: FRA

The FRA has been scheduled to be executed in the seventh day of our stay in BP. To identify the best sites for the analysis, it will be necessary to obtain information from different methods used:

- suggestions from the RFD regarding location of conservation and utility forest
- transect walks, that will provide us with observations of land uses and land uses changes
- community mapping sessions, that will point out the CPR (common pool resources)
- ranking of NTFPs, which reveal the most important forest resources
- Interviews with key informants and household heads and with the resources management group of the village, to collect information about the use of forest resources over the time and about the most important aspects of forests for their livelihoods.

The aim of the assessment is to understand how local users/de facto users (Ostrom, 1999) manage forest resources and in which measure community forestry in Ban Phrabat is sustainable and limited by the forest policy framework in act.

Appendix 6: PRA methods

Timeline

Our intent for the timeline is to gather information about the factors influencing the villagers' lives and their ability and desire to make a living from agriculture. The timeline will enable us to pinpoint significant changes and milestones in physical, socio-economic and cultural structures. Thus, it should not only show points in time, but also fluctuations over time.

The information we get from the RFD through the semi-structured interview should provide us with a basic framework to which we can relate the information from the villagers. The frame will then be filled with details on forest and land use, demographic changes and diversification of livelihood strategies. The information from the villagers will be gained through questionnaires (q), interviews with key informants (k) and informal interviews (i).

RFD (information gathered during semi-structured interview):

- Dates for various laws
- Dates for enforcing the laws
- Changes in forest cover, NTFP resources, species composition
- Beginning of forest management programs

Villagers (information gathered through questionnaires (q), interviews with key informants (k) and informal interviews):

- When (if it can fit on the timeline) did they start Tradition X and Custom Y. Have these things produced visible changes? (k, i) Beginning of forest management programs Changes? (q, k, i)
- Once livelihood sources have been identified, we can plot when these possibilities opened up/closed down. Eg. 1989, no more logging; temple built tourism income (k, i)
- Changes in # of people who work as farmers, ntfp gatherers, other jobs (k, i, (some triangulation with q))
- Demographic changes income growth, population growth/decline, age structure(?) (k, i, (some triangulation with q))
- Any significant changes in forest and forest use? (q, k, i)
- Migration trends (q, k, i)
- Availability of land (q, k, i)
- Fallow period (length allowed) (q, k, i)
- When was the orchard made? (k, i)
- Changes in ntfp resources (q, k, i)

Growth in tourism (q, k, i)

Chronology:

As we will take a bit of time to get to know the village, we will probably gather a bit of information through informal interviews before we have time to talk to the RFD. However, the RFD will provide the framework for the timeline, and as such should come as the first 'real' thing. As the information gained from the timeline isn't critical to have before using other methods, this is information which can be gathered whenever there is time for it.

Sampling strategy:

Household heads (for questionnaires); key informants will be pointed out to us by the headman, possibly we can identify some from the questionnaire; informal interviews will 'just happen'.

Seasonal calendar

The seasonal calendar is almost solely for the villagers with a small input from RFD and tourists in BP. It will provide us with knowledge about how the villagers' time is allocated throughout the year. This will give us insight into which tasks they feel are worth devoting most time to, as well as how labor intensive the times of the year are, if their income is evenly distributed over the year.

RFD (information from the semi-structured interview):

Any times of the year, when it is more important than others to keep an eye on the forests?

Villagers (information gathered through questionnaires (q), interviews with key informants (k) and informal interviews):

- Tradition X and Custom Y, if they are influenced by the seasons (q, k, i)
- When do they do each job? Farming, commuting, seasonal migration, major ntfps (q, k, i)

- Clearing, tilling, sowing, weeding, harvesting (q, k, i)
- Use of orchard (q, k, i (and a bit of own observations)
- When do you receive your income? (q, k, i)
- When is it season for the major ntfps (q, k, i)
- Tourist season (q, k, i (and a bit of own observations)
- Festivals (k, i)

Tourists

- When do you come to BP? (q (for tourists))

Chronology:

The timing of this exercise is not of vital importance to other methods and may be applied when we find the time.

Sampling strategy:

Household heads (for questionnaires); not-very-random tourists for the tourist questionnaire; key informants will be pointed out to us by the headman, possibly we can identify some from the questionnaire; informal interviews will 'just happen'

Ranking

This PRA method is used to assess the relative importance of the different NTFPs. Ranking is a comparative measure which provides an indication of their magnitude of importance in relation to each other. This allows an assessment of the level of importance of these products to people. To facilitate the comparison, it is best to allow participants to compare products within each type of commodity (i.e., fodder, fuel, food, etc.). Each type of product is represented by its local name, a picture, or the actual object, listing these products on the ground or on a piece of poster paper.

The scoring method will be explained and once participants become familiar with the procedures, they will conduct the exercise in groups of three. We will make note of the criteria that the participants are using, whether it is commercial value, strength, ease of collection, nutrition, etc. Criteria will generally vary by

commodity type. By investigating the criteria used for evaluation, the researcher gains information about why certain species are higher valued than others, (Poffenberger, *et al.*, 1992). A follow-up session could be very useful to obtain further insight on the reasons for the choices made. Data from scoring exercises will be displayed in tables.

Information obtained from this PRA method will be used to triangulate information on income sources from questionnaires.
Appendix 7: Field activities

	2/28/2011	3/01/2011	3/02/2011	3/03/2011	3/04/2011	3/05/2011	3/06/2011	3/07/2011	3/08/2011	3/09/2011
Anna	Introduction: village headman Transect walk	Transect walk with GPS: observations	Questionnaires households	Questionnaires households Questionnaires tourists	Mid term evaluation	Soil analysis	<i>Water</i> <i>sampling</i> Timeline	End of the questionnaires	Community presentation	End of the field work
Bekele	Introduction: village headman Transect walk	Interview with RFD	Questionnaires households	Questionnaires households Questionnaires tourists	Mid term evaluation	Focus group discussion (evening) Interview with resources management group	Water sampling Timeline	End of the questionnaires	Community presentation	End of the field work
Gloria	Introduction: village headman Transect walk	Questionnaires households Questionnaires tourists	Questionnaires households	Questionnaires households Questionnaires tourists	Mid term evaluation	Seasonal calendar	FRA	FRA	Community presentation	End of the field work
Kira	Introduction: village headman Transect walk	Interview with RFD	<i>Ranking NTFPs</i> Community mapping (evening)	Interview with market women Community mapping (evening)	Mid term evaluation	Seasonal calendar	FRA	FRA	Community presentation	End of the field work
Teresa	Introduction: village headman Transect walk	Transect walk with GPS: observations	<i>Ranking NTFPs</i> Community mapping (evening)	Interview with market women Community mapping (evening)	Mid term evaluation	Focus group discussion (evening) Interview with resources management group	FRA	FRA	Community presentation	End of the field work

Walid	Introduction: village headman Transect walk	Questionnaires households Questionnaires tourists	Ranking NTFPs	Interview with market women	Mid term evaluation	Soil analysis	Water sampling Timeline	End of the questionnaires	Community presentation	End of the field work
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Appendix 8: Research table

Problem formulation	Main Researc	h Question	Sub Questions	Required Data	Appropriate Methods
What are the effects of centralized forest policy and tourism on household strategies in Ban Phrabat and how are they related to deagrarianization?		What are the forest policies of Thailand and how are they interpreted by the parties involved.	 What is the policy framework related to access and tenure of Utility and Conserved forest. 	Information on types of access and tenure *enforcement	 ✓ Secondary data ✓ Semi-structured interview with forestry depart.
	of Thailand a they interpre parties involv		 What are the local provisions for forest management 	Identification of traditions and Custom influencing forest management.	 Interview of key informant (RMG*) Interview with traditional leader Interviews of resources users
			 Are local people involved and encouraged to participate in forest management 	Information on programs and initiatives involving local people in conservation and management.	 ✓ Interview with RFD ✓ Interview of key informant ✓ Interview with traditional leader
	II How does fo impact liveli	How does forest policy impact livelihoods	 How do forest resources contribute to household strategies? 	Identification of resource users and livelihood sources. Household composition (demography) and change (migration trends). Information on household strategies and trends. (job opportunities outside village)	 Questionnaires to households. Semi-structured interviews with hh. heads Community mapping with (males/females/young/old/forest user/farmers) Ranking with user groups Timeline
			2. What is the opinion of local people to forest policy?	Local awareness of forest policies Knowledge of forest practices Perception of RFD	 ✓ Questionnaires (random sample of households) ✓ Timeline
			 What constraints does forest policy have on agriculture? 	Soil quality assessment Fallow period Land use (availability of land)	 ✓ Soil analyses ✓ Semi structured interviews with RFD ✓ Focus groups discussion ✓ Timeline ✓ Transect walks

				Local people opinions		
				Assessment of on farm, off- farm and non- farm incomes		
			 What is the level of dependency of locals on natural 	How much time they spend harvesting, collecting NTFPs	\checkmark	Season calendar of NTFP harvest Resource ranking () Forest resources assessment in
			resources	Access to the market	\checkmark	conserved and utility forests Timeline
				Programs		
	III	How does tourism impact households strategies in Ban Phrabat	1. Which tourism attractions are available in the area	Identification of tourism attractions	√ √	Interview of key informants Timeline
			2. What income opportunities does local tourism provide	How much people works in tourism sector and for how much time	✓ ✓ ✓	Key informants (temple management group) Semi-direct interviews to villagers Seasonal calendar for tourism activities and peak season for tourists Timeline
			 How many people use opportunities provided by tourism to hybridize the households strategies 	Number of people earning primary or secondary income	√ √	Questionnaires Interview with market women