

FOREST MANAGEMENT IN NORTHERN THAILAND (BAN KHUN PAE)



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Abstract

This report focuses on the how PFM is practiced in the village of Ban Khun Pae in Northern Thailand. An introduction of the theoretical situation in Thailand and later the village is first presented. Empirically, the study is based on a combination of research methods, mainly a questionnaire, different PRA methods with the local community, semi structured interviews with different stakeholders in PFM and a forest inventory.

This study reveals that PFM is manifested as different activities such as fire control, reforestation and demarcation among others. These activities have specific areas in the forest where they are carried out, namely conservation, utilization and sacred areas. It also reveals that the areas are located inside a protected zone (national park) as a way of involving local communities in co-management of forests. It was found that the local community's involvement in the daily activities such as fire control is quite bottom up while the decision making process and formation of laws governing use of the forest is top down.

Nevertheless, the forest was found useful to the local community in supplying timber, firewood and other NTFP's. Therefore community involvement in PFM was found to be vital. The use effects of use of the forest were manifested through differences in forest stock in the different forest areas. Tree density was noted to show a decrease from sacred to conservation to utilization areas respectively. However, qualitative data indicated an increase in forest cover as compared to 20 years ago.

Abbreviations

CF: Conservation Forest

CIFOR: Centre for International Forestry Research

DANIDA: Danish International Development Assistance

DBH: Diameter at breast height

Dg: Diameter of the tree with the mean basal area

DoNP: Department of National Parks, Wildlife and Plant Conservation

FC: Forest committee

HNCC: Highland nature conservation Chom Thong

IUCN: International Union for the Conservation of Nature and Natural Resources

LSD: Least Significant Difference

NFC: Non Forest committee

NTFP: Non-Timber Forest Products

PFM: Participatory Forestry Management

SF: Sacred Forest

TAO: Tambon Administrative organization

UF: Utilization Forest

Group 2 Forest Management in Ban Khun Pae

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Conclusion	The whole group	

Chapter 1 Introduction

Participatory Forest Management (PFM) in Thailand is a rather complicated practise owing to the disparities in laws governing it, areas where it is practised and involvement of different stakeholders. In many parts of the world, a shift of paradigm in forest management has seen governments in developing countries hand over the stick to forest dependent communities to use and manage the forests, as the governments themselves have often failed to do so effectively (Matakala and Kwesiga, 2001). At the same time, there has been international pressure on conservation which has resulted into many areas considered to harbour special biodiversity being declared as protected areas (Worldbank, 1999). Thailand seems to have been caught up between the two. For some reasons, many of which are seen as aiming to protect the ecologically sensitive zones, large areas have been declared as national parks in Thailand. The process, in which this has been done however, leaves a lot to be desired. Some of the areas declared as national parks are settlement areas, with people who have been living there for generations before they were termed as protected areas, specifically national parks. According to the IUCN, a national park refers to “a large area (under category II) wherein one or more ecosystem is preserved, unimpaired by human development or occupancy” (IUCN, 1978). Now that people are living inside the areas seen as ecologically sensitive and they have been declared as national parks, the relation between the forest and the local community, and the stakeholders with protection goals in mind must change.

Firstly, we do not expect the forest dependent communities to stop their forest related activities just because a law has been declared. Secondly, the law has been declared in areas where the setting is unfavourable (in this case, a national park in an already occupied zone). Thirdly, the law is made by people who don't depend on the forest, and who don't fully understand the value of the forest to those who are dependent on it, and is brought down to the local people. So how does this work out?

This study is based in a setting as described above. The villagers of Ban Khun Pae, like many communities near forest resource are reliant upon many forest products and services for their daily livelihoods (Traynor *et al.*, 2002). These people have lived and used the forest for more than a century since they migrated into this area. Now they find themselves trapped by a law that restricts them on how to use a resource they have known for so long. Amidst all the circumstances described above, the villagers are still enjoying some rights of use and management of the forest. The same government that introduced the protection law has taken a different approach by acknowledging the people's existence in these areas and now working on some modalities on how the forest and the people can co-exist by adopting principles of PFM.

The overall research question therefore is on how PFM is practised in Ban Khun Pae and how this affects the local people's livelihoods. To answer the question, it was necessary to know the areas where PFM is practised; is it in the whole forest area or are there restrictions to specific areas? What are the different activities that characterize PFM in Ban Khun Pae, for instance demarcation, fire control, etc. How do people perceive their involvement in these activities; is it an obligation or voluntary? Are they satisfied with the way they are involved or would they want to be given more authority and in which areas? Who are the stakeholders involved in PFM activities in Ban Khun Pae? How do they work with the local community?

An investigation on how forests are important to the local community in terms of products and services was also done; For instance, which products does the local community collect from the forest? Their different uses were also identified. The values of some products and services were estimated through surrogate market prices and further linked to the subsistence income. It was also hypothesized that utilization could possibly have some measurable effects on the forest resource and therefore a forest inventory was carried out assessing such indicators as tree density, stumps and regeneration among others. Lastly, aspects of forest management and utilization were then linked to livelihoods by looking at the role of forests from a five capital perspective as shown in Sustainable livelihoods guidelines (DFID, 1999).

Summary of research questions/ objectives:

Overall research question:

How Participatory Forest Management is practised in Ban Khun Pae and how does this affect local people's livelihood?

Specific research questions:

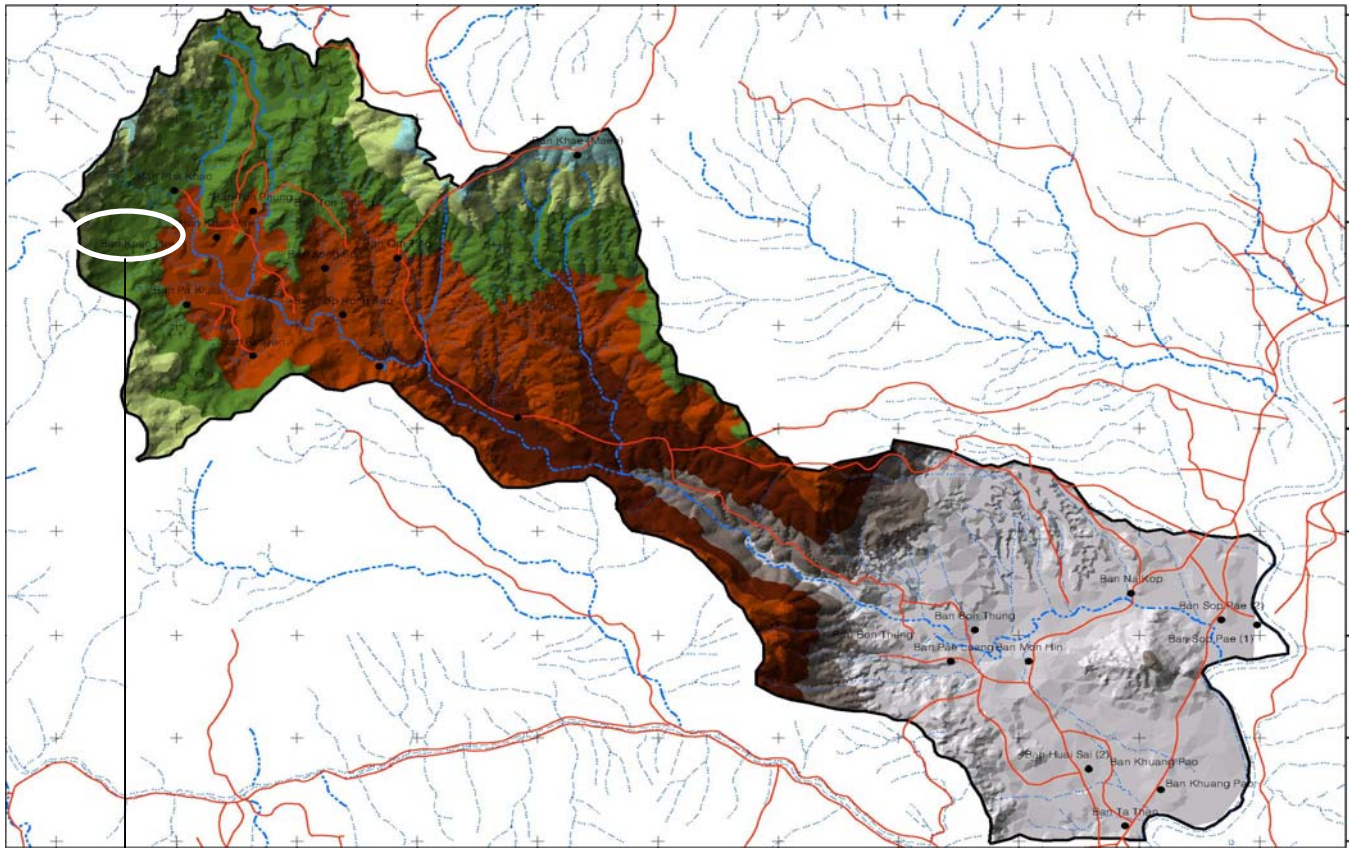
1. How is PFM practised in Ban Khun Pae?
2. How do local people perceive the practise of PFM in Ban Khun Pae?
3. How are forests utilized in Ban Khun Pae?
4. How does utilization affect the forest resource within the area of Ban Khun Pae?
5. How does utilization and management affect local people's livelihoods?

Local context

The fieldwork was conducted in the small village of Ban Khun Pae, which is situated in the upper Mae Pae Watershed, Chom Thong District, Chiang Mai Province in Thailand.

Ban Khun Pae is a village with approximately 184 households. The population is mainly Karen, with very few exceptions. The year of the foundation of the village is unknown, although people have been living here for generations. The majority of the villagers are farmers. The major religion in the village is christianity, along with some traditional Karen belief (animism).

Figure 1: Mae Pae Watershed



(Source: Chiang Mai University)



Our study area (Ban Khun Pae)

Chapter 2 Methodology

Applicable fieldwork methods

Conducting research in a village in Northern Thailand for ten days only posed different methodological challenges. Beside not speaking the local language and therefore constantly being in need of an interpreter, the time factor was to be greatly considered. It was also necessary to collect a lot of data in a short time and therefore various PRA methods conducted during focus group discussions would be highly relevant (Mikkelsen, 2005). Selecting specific respondents for later individual semi-structured interviews could be arranged by asking the people invited for focus group discussions (i.e. with a snow-balling technique).

Conducting research in a village also made a questionnaire applicable because general opinions about forest issues could be collected in a short time and with high representation of the whole population. Finally, since the study would involve issues on forest management and utilization, it was found to be highly important to measure the observable changes in the forest stock and this necessitated for a forest inventory.

When conducting a research that combines both qualitative and quantitative methods, it is necessary to be aware of the advantages and disadvantages of the two approaches and where they complement each other. For example, where data obtained from quantitative methods help in providing an overview of the research topics, the qualitative data go more in depth with the issues (Carvalho and White, 1997). In short, to obtain the best possible triangulation of the research area, it is important to combine the different methods and it hence calls for the interdisciplinary approach, which is the cornerstone of the SLUSE programme.

Methods used in the field

Social science Methods

This study involved different kinds of PRA techniques such as: transect walk, seasonal calendar and community mapping. The reasons for using PRA methods were multifold but especially based on the fact that a participatory approach enabled us to not only obtain information about the community but also to create an informal platform which allowed for a broader exchange of information (Selener *et al*, 1999). It was also a good way to get a general overview by the use of e.g. community mapping as well as to get more specific information by the use of e.g. seasonal calendar. Thus, the PRA methods provided a different kind of data than the individual interviews for our research situation.

Forest walks combined with **participant observations** were used to familiarise ourselves with the new environment, find out the boundary between farm land and forest as well as the different zones of forest. A forest walk with the local guide saw us transect from the village to the mountain peaks and see the vegetation zoning. This helped us to recognise and know the structure of the different strata for forest inventory. Another forest walk was conducted to triangulate the data already gathered, such as the forest area they used for collection, what kind of products collected in those areas and the knowledge of boundary. This walk was arranged through the women leader with five female NTFP collectors to take us to the place where they collect forest products. During this walk different kind of NTFP and the methods used for collection, time spent for those collections, uses and the name of the plant species by informal talks were observed and recorded.

The purpose of the **community mapping** exercise was to get a quick overview of the location and the physical boundary of the community forest, conservation forest and the sacred forest. The information gained from here was used mainly for forest stratification.



Community mapping in the village



Focus group discussion

A **seasonal calendar** was designed to provide information on different products the local community collect from the forest, seasons and the amount of collection. This data was particularly important in answering the research question on how forest is utilized. The exercise was done separately with the two groups of women and men with an aim of identifying whether the two groups had different views.

Five **focus group discussions** were also conducted. Two focus group discussions were carried out with men only, another two with women only and a last one with both women and men. The aim was to understand villagers' social roles, attitudes, awareness and different perceptions in forest issues and influence of other organizations on forest management, stakeholder analysis, information of utilization of forest resources and related context within the village.

Unlike the focus group discussions an **informal group discussion** was also conducted in the small sub-village, Ban Pha Khao to get an overview of forest management in Ban Khun Pae. The discussion was overall very useful, because a lot of keywords on forest related issues were obtained which could be used in the interviews and focus group discussions. It gave the villagers an opportunity to talk about whatever they found relevant and we therefore did not “put words into their mouth”.¹

Household survey in the form of a questionnaire consisting of closed and open-ended questions was also done. The overall frame of the questionnaire was organized to extract basic information of the village and the forest issues. Random sampling without replacement method was used to select 37 households corresponding to 20% of the whole village. This method was selected to avoid the bias in selection and since it was agreed upon as a scientifically accepted method (Mikkelsen, 2005). The questionnaire was pre-tested on one village member and consequently shortened considerably to take approximately forty minutes.

Semi structured interviews were conducted to extract data on what is *de facto* and what is *de jure*, and how different stakeholders are involved in PFM in Ban Khun Pae. It was easy to converge in the evening and discuss a new stakeholder that we had come across or had been mentioned during the day and prepare an interview for them. In total, we had 12 interviews instead of the 5 we had planned for while going to the field, but it is not the number that is exciting, but the kind of new information we were able to gather from them.

Natural science method

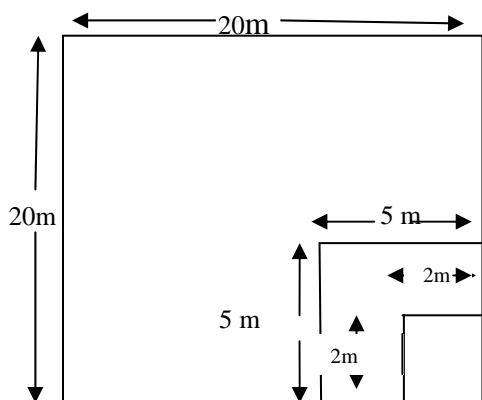
The forest area under control of Khun Pae village consists of approximately 640.83 ha, of which 612.64 ha is conservation forest, 26.21 ha is utilization forest and 1.97 ha is sacred forest. To study if there was an effect of the local people's activities to the forest resources a small scale forest inventory was carried out using stratified random sampling. Each forest area (conservation, utilization and sacred) constituted a stratum, so three strata were taken into consideration. Ten sampling plots were laid out in the entire forest, four in the utilization forest, four in the conservation forest and two in the sacred forest, corresponding to sampling intensities of 0.610%, 0.026% and 4.052%, respectively, and an overall sampling intensity of 0.0375%.

The indicators of the effects of the human activities in the forest taken in consideration in this study were: number of trees per unit area (density), number of species per plot, number of stumps per unit area, density of saplings and seedlings, size of the trees (as measured by the diameter of the tree with mean basal area (D_g)).

¹ Although not initially intended focus group discussion was divided in to gender to ensure women participation.

In each sampling plot all trees with diameter at breast height (DBH) equal or bigger than 10 cm were measured. The diameter of those trees were measured and recorded and the local names of the species were identified and afterward matched with the specific names from secondary sources. The saplings (DBH larger than 5 cm and smaller than 10 cm) and seedlings (DBH smaller or equal to 5 cm) were count in subplots laid out in the second corner of the plot, the subplots had an area of 0.0025 ha (5 x 5 m) and 0.0004 ha (2 x 2 m), respectively. The following is the sketch of the sampling plot.

Figure 2: Sketch of sampling plot used in the study



(Source: Sampling data)

Where necessary all plots were corrected for slop when establishing it. All trees and borderline trees were measured and treated according to the standard rules as discussed by Husch et al (2003) and Khol (1993).

Reflections of the methods

With all the methods employed it was possible to collect enough data for the current study. However, we believe the focus group discussions could have been better planned: discussion with the interpreters on what to present was not done sufficiently enough and the respondents should have been briefed prior to starting the discussion. The sitting arrangement between the group members and the respondents were not organized well for a fruitful discussion, the group members and the respondents were divided and the respondents could feel intimidated and consequently not expressed themselves freely.

The forest inventory could have been more efficiently done had inventory team divided itself into two. The methods also did not integrate ways of collecting the data to adequately answer our question on livelihoods. This should have been taken into consideration when preparing questionnaires and interview guides.

Overall representativeness of the data

This research deals with issues of participation, forest use and management. These topics can be compared across many regions in Asia, Africa and South America where PFM is practised. However, with the focus

of one village and data collected in ten days, such comparisons would be too ambitious. Nevertheless, our study gives relevant perspective on local and national level.

Chapter 3 Participatory Forest management in Northern Thailand: By law or by practice?

Introduction to PFM

Participatory Forest Management in this context means involvement of the local community in the management, decision making, utilization and protection of the forest resources. Otherwise, PFM involves different approaches that go by the terms community forestry, joint forest management, social forestry, among others (Anorl, 1992; Hobley, 1996).

The *status quo* of the inhabitants of Upper Mae Pae Watershed, and in particular Ban Khun Pae village where the study was located is that of a shift from forest dependence to dependence on agriculture for both household and cash income (*see figure 2*). In the past, the local people depended on the forest mainly to get new fields for opium cultivation and rotational rice farming (shifting cultivation) but also to collect NTFPs for their own consumption. When asked on the steps that have seen people shift focus from such heavy use of forests, the Ob Luang national park superintendent says that the government policies which were geared towards stopping the hill tribes² from cultivating opium and replacing this with cabbage, red onion and other cash crops played a major role. From an interview with Dr. Sidtinat³, cabbage was a perfect replacement for opium as it does well in the same ecological zones as the opium.

What is *de facto* and what is *de jure*?

It is important at this juncture to clearly state that Ban Khun Pae, is one of many villages located inside Ob Luang national park, i.e. by law, it is under a protected area. However, there is a big difference between what the law states and what is practiced. Ambiguities within laws in Thailand are not a new phenomenon, and studies on access rights by documents this (e.g. Ribot and Peluso, 2003). It is therefore not surprising that even what is *de facto* in Thailand can be twisted. Pedersen gives an amicable example about the RFD in Thailand; "...more importantly, they (RFD officials) accept that they are dealing with people and therefore that the incentive for the people not to violate the law should be in the form of a carrot rather than a stick (Pedersen, 2006). The following analysis deals more in-depth with this.

The national park was created with 3 main objectives:

- To conserve the biodiversity

² There are nine so-called "hill tribes" living in 20 provinces in Northern and Northwestern Thailand. The Karen people are one of them. "Hill tribes" are internationally recognized as indigenous peoples, who are acknowledged as such, by the following criteria (as stated by ILO Convention 169): either because they are descendants of those who lived in the area before colonization; or because they have maintained their own social, economic, cultural and political institutions since colonization and the establishment of new states (IWGIA, 2006; www.iwgia.org).

³ Dr. Sidtinat is a JoMPA representative and one of the Thai professors in the SLUSE programme.

- To preserve and conserve the forest for tourist attractions
- Use the forest for research and education purposes

What is special about Ob Luang national park?

The national park was declared in an area where people had already settled. As Rigg argues, some areas were settled and cultivated *before* the National Reserve Forest Act in 1964. So, in a very real sense, there are farmers who could legitimately claim that *their* land has been encroached by the state through establishment of protected areas (Rigg, 1993).

In Ban Khun Pae, instead of relocating the local people by use of force, the national park superintendent has adopted the policy of co- management with the local communities so that even though by law a national park should have more strict regulations regarding entry and use, this is not the case:

“The local community has been managing the forests since time immemorial, if the practice of co-management is successful by practice in absence of a supportive law, we can change the law later to suit the practices”

Ob Luang NP superintenden.

This research argues that if the community forestry management law is not put down on paper, then the future of the local community is at the mercies of the person in command at that particular point in time. It is a case of balance between *flexibility* and *security* of rights as argued by Lindsay (1999). The current national park superintendent in Ob Luang is considered a “white sheep” among many “black sheep⁴” since he has been supportive of community forestry in areas not allowed by law. In actual terms, he has worked with the director general of national parks, who is empowered to allow for activities in the forests (*box 1*).

Box 1: Section 19 of the natural reserved forest act of 1964

For the purpose of control, supervision, maintenance or improvement of the National Reserved Forests, the Director-General is empowered to order, in writing, the competent officer or officer of the royal forest department to carry out any activity therein.

(Source: National Forest Act of 1964)

The national park superintendent also works closely with JoMPA, which is a pilot project with the aim of integrating people into management of forests. In order to do this, they make use of the third objective of establishment of the national park, which allows the area declared as a national park to be used for research

⁴ Black and white sheep is ambiguous, because it depends on who is looking at it.

and education purposes. It is worth noting the level of importance the national park superintendent attaches to JoMPA:

“The JoMPA project, being a pilot project for the use of PFM in national parks, will tell a lot on what way the decisions regarding PFM will go. However, their goal is to use PFM and develop management strategies suitable for the area, and avoid the use of *guards and guns*”.

This research argues and refers that it is important to give people rights to use the forest resource, but it is even more important to ensure such rights are clearly stipulated and guarded by law (Lindsay, 1999).

Which bundle of rights for the local community?

Access and withdrawal

The current access and withdrawal rights are only *de facto* since they are not recognized by law. “The local community has the right to harvest all products from the utilization zone as long as it’s for their *own consumption*” says the president of the watershed committees. Asked what was the measure of *own consumption*, he said it should not exceed 10 kg’s for medicinal plants and vegetables. This however seemed to be known only by him, since the local community did not give us any limitations when we constantly tried to investigate. In the conservation forest, the villagers can only harvest timber with permission from the watershed committee⁵.

Exclusion

Each village has it’s own particular forest which they use but it is also possible to get special timber for construction from a neighboring village with permission from the village committee. The only concern that was with the lowlanders:

“.....however, if people from the lowland interfered with the way we manage the forest, we shall feel awkward.” *Local women*.

It is however not clear how they would deal with lowlanders coming to harvest forest products or interfering with the way they manage the forests, a possible source of conflict and an issue we could have perhaps done more research on.

Alienation

⁵ Contrasting information on the role of the committees, because the local people said permission was obtained from the village committee.

The people living inside Ob Luang national park have no rights to sell or lease the forest land. They are working with the national park department as “co-managers” but not “co-owners”.

Summary of rights

After careful consideration of the data gathered, we can only confidently classify the local community *authorized users* (Schlager and Ostrom, 1992), since the national park department currently has more power and control over the forest than the community itself. Another possible weakness of their rights is that if the government allocates the forest to a concession or another government body, the community cannot challenge government’s decisions in court. That possibly explains why the national park was declared without consideration of the fact that people had already settled in these areas.

Chapter 4 Participation

What is meant by participation is highly context specific and its effects range from coercion to full control (Hobley, 1996). While PFM in Ban Khun Pae is not a project *per se*, an attempt to classify the typology of participation that the local community has in different activities ends up with a mixture of levels ranging from **participation by consultation**, where people participate by being consulted while external agents define problems and information gathering process, and also control the analysis e.g. in demarcation to **self mobilization**, where people participate by taking initiatives independently of external institutions but they develop contacts with external institutions for resources and technical advice e.g. in fire control.

How is the local community involved in PFM

To understand how the local community is involved in different PFM activities it is important to know where the activities are taking place. This information was furthermore used for the forest inventory (see chapter 7). It was recognised that the forest around Ban Khun Pae is divided into three areas: conservation, utilization and sacred forest. Prior to the fieldwork a list of activities characterizing the practice of PFM was created (see table 1 below). This list was presented to the local community in a focus group discussion.

Table 1: Activities that characterize PFM in Ban Khun Pae

Activities	Areas practiced			Decision-making		
	Farmland ⁶	UF	CF	FC	NCM	Others, specify
Demarcation	X	X	X	X	X	X
Firebreaks	X	X	X	X	X	X
Reforestation	X	X	X	X	X	X
Committee formation	X	X	X	X	X	X
Medicinal plants	X	X	X		X	X
Timber	X	X		X	X	X
Fuel wood collection	X	X	X			

(Source: Focus group discussion)

⁶ Farmland is included, but it was soon realized, that although different PFM activities take place in this area, it is the individual farmer's responsibility and hence not a community activity (though decisions hereof are taking place in community meetings). The report has a focus on the three above mentioned forest areas, because they are being managed and used by the community as a whole.

Table 1 above indicates some of the PFM activities being practiced in Ban Khun Pae. In summary, the shaded regions are interpreted as; *demarcation* is done for all areas and the decision making process involves the local community (NCM), forest committee (FC) and other stakeholders (others). The forest committee (FC) do not make decisions on *medicinal plant collection* and *firewood* can be collected in any forest zone. In almost all the activities outsiders (marked as others on the table) were also involved. These *other* stakeholders were for example government agencies such as the Royal Project, the National Park office, the Watershed office and the TAO. Some NGO's also assisted (see stakeholder analysis for a more in-depth discussion of this).

To get an understanding of the importance of the three forest areas, local understandings of the key terms were obtained. (see box 2). The three areas were furthermore drawn by local villagers on a map of the Ban Khun Pae area.

Box 2: Local understandings of key terms

-Utilization forest (*Pa Chai Soi*): (This we also call *community forest*. National park officials tell us about the rules. We can go and collect products here. No permission is needed.

-Conservation forest ((*Pa Ar Nu Rak*): We can't cut any trees here, although there is the *buffer zone* (called "land in between"), between the conservation and utilization areas. Here we need permission, a signature, from village committee to cut trees. The buffer zone is 10 metres away from the headwater stream. Without permission, we can collect dead wood found on the ground.

-Sacred forest (*Pa Kwam Chua*): We have been practicing our traditions here for many years. It's a holy place, where we used to go and pray. This is not done so much anymore, but it is still a place of worship, as we bury our deceased here.

(Source: semi-structured interviews and focus group discussion)

Participation within the local community

Whereas it was found that there is no defined role between man and woman in the daily collection of forest products in Ban Khun Pae, it was realized from the meetings that it was organized that they are mainly attended by men. Some women came for the meetings but took a low profile where they only talked amongst themselves but could not talk in the midst of the male dominated discussions. The same women in a women only discussion spoke on how they use the forest:

"....we collect a lot of vegetables and medicine for our own use. The most common ones are *kilosa*, *polsa*, *kotila* and *doku*. We don't sell them since there is not enough from the forest for sale. Also the village rules forbid us from doing so."

Kiamakoo, a local woman.

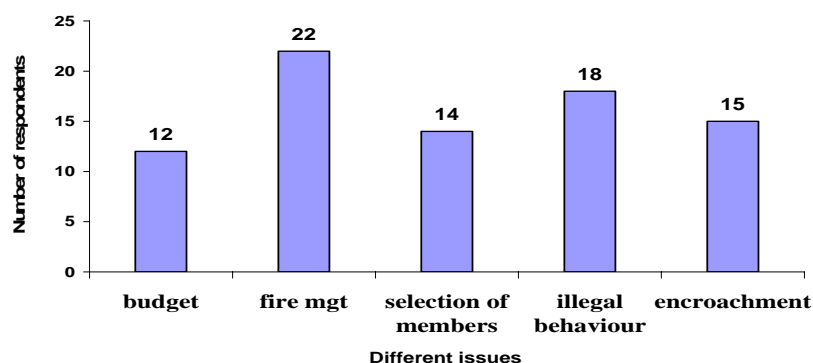
During the men’s focus group discussions, there was a relatively fair distribution of contribution. To them, the way they are involved and the participation in the community was evidenced supported by the following remark:

“.....the forest cover is increasing if we compare it to about 20 years ago, which shows we are conserving it by all means. This would not have been possible were not for every villager’s efforts. We want to conserve it for our future generations. However, our major worry is that the water levels in the streams are still down despite the increase in forest cover...”

From our analysis, the forest cover seems to be important criterion here. A study by former a SLUSE student this year indicated a significant increase in forest cover in the watershed where Ban Khun Pae is located. Further, JoMPA’s main indicator as mentioned by it’s representative to be “no more expansion of agricultural land and/or settlements into the forest”. This aims at maintaining the forest cover and ecology and also, improving it.

The local community is represented by different committees, who overall form the village committee. The committee holds regular meetings with the local community to discuss issues affecting them. An enquiry on the five most discussed issues within the village meetings gave us the following results (figure 3):

Figure 3: Issues discussed during forest committee meeting



(Source: questionnaire. n=37)

PFM and social responsibility

The communal engagement of PFM is thus being carried out during meetings, where decisions are being made. Villagers are working together to protect the forest resource upon which they depend for their daily livelihood. When asked to describe PFM, the explanation was the following:

“Management where everyone is involved, especially the committee. But since the village committee cannot take care of everything, everyone helps” *Villagers in focus group discussion.*

Exchanges of services are taking place when every villager in Ban Khun Pae must e.g. make firebreaks, because in return he/she will obtain security against fires coming into the village (this might be why fire management is most discussed issue-see figure3). It creates a sense of belonging to the local community, saying *we are all in this together*. The social relations within the village can be understood as being sustained by these service exchanges and the obligation to participate in these services. A way of understanding this is with the concept reciprocity⁷. In the case of PFM, *balanced reciprocity* (Sahlins, 1972), where everyone must exchange the same amount to obtain a social balance, must exist to make everyone feel like everyone is contributing equally to the benefit of the community and its forest. Complains about people not participating but still using the forest resource is therefore free riding and is not accepted. A local villager, Bohkha, explained this during an interview (*see box 3*).

Box 3: Interview with Bohkha

I: *When do you make firebreaks?*

B: *Every year, once a year. They announce it in the morning. Everyone is being told to go.*

I: *But what if you can't go that day?*

B: *There's always someone from the household who can go and help.*

I: *But what if no one from the household can go?*

B: *Well, then you must go and tell the village headman your reason and then it's okay. But next time you must go...*

(Source: semi-structured interview. I= interviewer, B= Bohkha)

There is a social responsibility of participating in the PFM activities and it is expected that you can go right away when you are being told to do so. If people do not participate it is being noticed immediately and sooner or later everyone must participate. It is as such a moral responsibility towards your fellow villagers.

⁷ Reciprocity: “Mutual exchange or obligation. More generally, the relation between people in an economic system, the obligations they have towards each other in such a system, or the practices they engage in in relation to one another” (Bernard & Spencer, 2003: 619).

It is thus the service exchanges within PFM which can be said to “reflect and shape the identity of the social actors involved [and] the relationship those actors have with each other” (Carrier 2003:219). It is in fact the *social reasons* (e.g. cooperation) that come before *environmental reasons* (e.g. more trees in forest) when people answered why they were involved with certain PFM activities (*see table 2*).

Table 2: Which PFM activities are you involved in and why?

Reforestation	Firebreak
It is a village project / cooperation 63 %	It is a village project / cooperation 55 %
There will be more trees in the forest 7 %	Protect village and/or forest from fire 25 %
Person is a committee member (duty) 15%	Person is a committee member (duty) 15%
Highlight special days 15%	Outsiders might destroy the forest 5%

Source: questionnaire. n=27

(27 out of the 37 respondents said they are involved with reforestation and firebreak).

Problems with participation?

The table above illustrates a picture of PFM in Ban Khun Pae where everyone knows they must participate although other data seem to show the opposite. The Community Master Plan of Ban Khun Pae from 2002-2007 indicates: “There is a problem about participation in village activity, because the villagers pay little attention and they concentrate about earning their income”. To solve this problem the way forward is to: “Encourage the local participation in village development that everyone should help each other and be cooperative”. Table 2 seems to illustrate very clearly that the local villagers got the message about being more cooperative, since the majority gave this answer as to why they are involved. Although this seems to indicate that the Master Plan has worked, it is still important to be aware of the fact that a local community must never be regarded as a homogenous unity, instead it is important to notice possible internal power structures and individual opinions (Agrawal and Gibson, 1999). Hence it is essential to go more in depth with individual opinions about PFM in Ban Khun Pae (*see box 4*) to get a more complex picture of the current situation and thereby understand different material and non-material motivations of participating in community activities (De Groot in Drijver, 1992).

Box 4: General view about being involved in forest management in Ban Khun Pae

“We should conserve forest area for our children in the future”.

“It is good to have rules to protect our forest”.

“I can’t do the things I used to do. Now everything I do in the forest must be discussed with everyone in the village beforehand, - always discussion before action”.

“The management is good in this village; everyone cooperates and protects forest”.

“It’s moderate management, because some villagers don’t give much cooperation”.

(Source: Questionnaire n=37)

Stakeholder analysis

According to Schmeer, a stakeholder analysis is “a process of systematically gathering and analyzing qualitative information to determine whose interests should be taking into account when developing a program or a research” (1999).

Different stakeholders in Ban Khun Pae

Local community

This is the forest dependent community in Ban Khun Pae, which in practice is the whole village since they all reside in the forest. They have been carrying out some forest protection activities such as fire control even before the advent of the paradigm of participatory management in Thailand. They live with the forest and siphon a lot of benefits from it, hence from our view, they are the major stakeholders.

Village committees

The village has several local groups, which all belong under the village committee. The only exception is the watershed committee, because it was founded later than the others. The former has 49 members in total and the latter has 15 members. The village headman is the chairman of all the groups, including the woman group. The watershed committee controls forest use and management in relation to external factors, whereas the village committee controls the internal factors.

TAO

This is the local authority arm mandated to carry out activities that improve the welfare of the rural communities. According to the interview respondents with the secretary to TAO, the TAO is more concerned with better infrastructure, health care, etc. But they are also mandated to carry out activities that enhance environmental protection.

DoNP

This is a newly created department under the ministry of Natural resources and Environment (MONRE) mandated with management and protection of the National parks declared in 1991.

NGO's: local and national

Their roles are mainly to support the local community in fighting for their rights. They are divided according to the sides they support, either lowland or highland. Examples: IMPECT, HNCC and Thammanart.

JoMPA: Joint Management of protected areas: Works with other NGO's and government bodies involved in management of protected areas. (See box 5)

Box 5: JoMPA

JoMPA can be described as a concept that involves bringing together different stakeholders in participatory management of protected areas in Thailand. It is a brain child of researchers and development partners, particularly supported by DANIDA. At the moment, JoMPA has been able to bring together stakeholders for discussions on contentious issues, including NGO's with different views technically labelled as "left wing" and "right wing"⁸ NGO's, government bodies and the local community.

According to the project's subcomponent description, JoMPA is exempted from the existing legal framework for PA management as well as mandated to experiment with innovative approaches (*ref: JoMPA sub-component description; stated "not for quotation"*). With such an opportunity, we emphasize that the project should be able to work more with the local community for instance in helping them establish systems that can help them prove their sustainable use of the forest, e.g. a community management plan.

An interview with the JoMPA representative, Dr. Sidtinat indicated that the major indicators of the success of the JoMPA project would be "no more expansion into the forest land". This they plan to prove by use of satellite images on land use cover changes.

In terms of forest politics in Thailand, JoMPA works closely with the TAO which has an "elected wing" that is more transparent and reliable and is downward accountable. The appointed wing is upward accountable. Even then, JoMPA is treated as purely research work in the national park area as per the provisions of the third objective in the section 19 of the national park law (*see box 1*).

(Source: Semi-structured interview)

International NGO's: CARE and World vision

Work mainly as consultants with the local community and other stakeholders in the village.

DANIDA

Main role is funding the PFM initiatives in the village through JoMPA and other NGO's.

Decision making

The local community is represented by the village committee when negotiating about different issues with other stakeholders. The nature of the issues discussed varies as shown on figure 3, but all the issues are discussed between the community and the committee in village meetings before the committee meets the external stakeholders. The villagers said that the external stakeholders mostly work as consultants, because they give advice or funds to certain village projects. Due to time constraint, we were able to discuss with the local community on how decisions were made pertaining one of the most crucial processes going on in the village, **demarcation** (*see table 3*).

⁸ One of the major challenges facing JoMPA is working with NGO's with diverging opinion regarding forest management in the protected areas. Accordingly, these varying sides have been labelled as *right wing* (those in support of the lowland communities e.g. Thammanart and perceive themselves as "more environmental conscious" since they view the highlanders as "destroyers of the ecology" and *left wing* (those supporting the highlanders, and would rather have the community integrated in the management of the forests for their livelihoods than evicted) e.g. IMPECT.

Table 3: Stakeholder analysis on demarcation in Ban Khun Pae

	Local community /Village committee	NGO's eg: JoMPA, IMPECT	Royal project	TAO	NP/ RFD
Planning	X				
Deciding	X	X	X		X
Implementing	X	X	X	X	X
Evaluating	X	X	X	X	X

(Source: focus group discussion)

From the table above, the local community viewed themselves as the origin of the demarcation process, in fact, they said that they got advice from their priest on demarcation some 40 years ago. Though we did not find time to do a similar analysis with the other stakeholders mentioned, interview data from these stakeholders shows that:

- The local community perceives themselves as the origin of the demarcation process, as indicated by the planning column
- IMPECT representative agrees that the community had discussed the issue of demarcation even before other stakeholders came in. IMPECT carried out the first demarcation process with the local community without consulting other stakeholders such as National park office and JoMPA
- JoMPA had the resources and the ability to bring all stakeholders together and therefore a second “participatory” demarcation was carried out, which made use of the maps that IMPECT had already produced

Equity

Within the short period we had to collect data and especially on sensitive issues like whether the local community members have an equal voice in management, we can draw some important conclusions:

1. **Leaders:** The forest management decisions are made by village leaders in Ban Khun Pae. The villagers have a chance to air their views in village meetings but the final axe on what is to be adopted lies with the leaders. The villagers do not vote for the decisions.
2. **Unequal contribution, equal share:** There are no limits on how much one should contribute in terms of participation in different activities, although people are expected to participate when asked to (*see discussion on PFM and social responsibility*).
3. **Elite capture** (Ribot, 2002 and Chomitz, 2007): Although there are different committees in the village responsible for different activities, such as health and watershed committee, we realized that

it's almost the same people in the different committees. This was also confirmed by our interview with JoMPA representative:

“....the committees have different names, but it is the same people, the only division among them is that there are those supporting “left wing” NGO’s and those supporting “right wing” NGO’s.”⁹

Another argument for the discussion on elite capture is that for the various focus group discussions we organised, some faces were always there, on the front line and taking control of the discussions. No matter how much we tried to encourage the other people who attended the meetings to talk, some seemed to shy away.

- 4. Top-down versus bottom-up approaches:** Giving local people the incentive to participate in matters that has an affect on their livelihoods, here forest management, gives them a sense of being in control. However, participatory projects often fit into projects already designed by outsiders and local communities do not have much possibility of influencing the process (Mosse, 2001). The JoMPA project has been criticized for still promoting a top-down approach, due to the fact that the local people are not part of the decision-making process (IWGIA, 2006). One of the main questions is whether local participation in resource management is only a means where conservation is the end or is local participation (empowerment) an end in itself (Drijver, 1992)? Despite these arguments, the villagers in Ban Khun Pae say that it is them who are in control of which PFM activities they should conduct, as table 1 illustrates.

Summary on equity: Ideology Vs. practise

We wish to state at this point that we understand that communities are not homogeneous (Agrawal and Gibson, 1999), hence we did not expect Ban Khun Pae to be as such. One of the explanations we got for the committees was that the Thai people are organised in hierarchy, and everybody knows their position in the hierarchy, and respects those above them. The community “trusts” their leaders and will let them decide, because the Thai culture is embedded in that.

Our analysis on equity shows that the local community needs to be empowered to make decisions on utilization and management of the forest and also solving the conflicts. The forest dependent people living

⁹ For right wing and left wing NGO’s, see challenges of JoMPA.

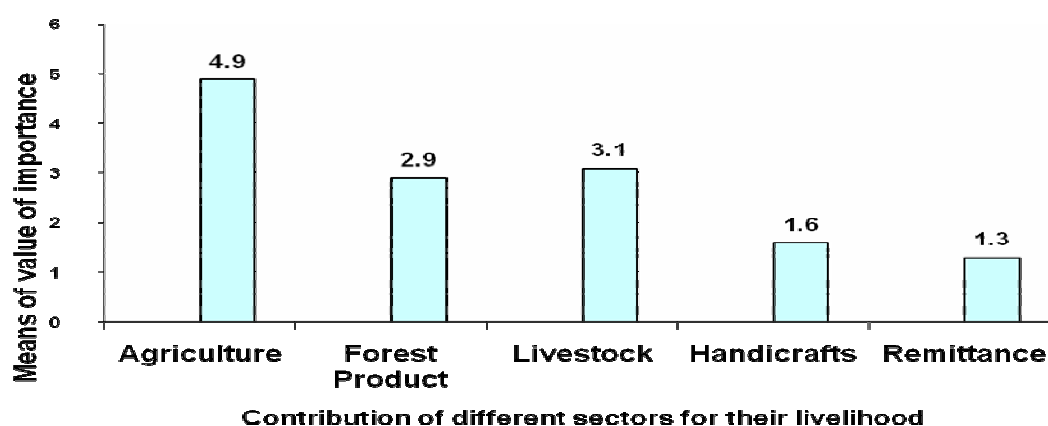
within the forest area should make the decisions regarding the forest they are using and not decisions made in Bangkok on behalf of them. Arguments in favour of decentralized natural resource management have emphasized the need to devolve power to the local communities and this is also needed for Thailand (Johnson and Forsyth, 2002).

Chapter 5 Forest utilization in Ban Khun Pae

People's perception on contribution of different sectors in their livelihood

It is important to understand how people interact with forest on daily basis before discussing the kind of intervention in it. People's perception on forest dependency was analysed with the help of ranking ranging from most to least important (*see figure 4*).

Figure 4: Perceived contribution of different sectors in their livelihood of BKP village



(Source: questionnaires n=37)

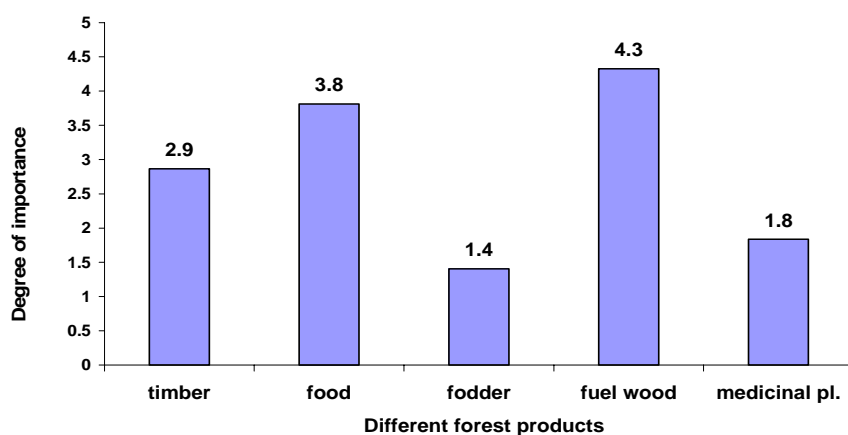
The main source of income in the village was found to be agriculture (cash crop) followed by livestock. Apart from these, other income source activities were in the following order: forest, handicrafts and remittance. Forestry ranked third compared to the other income generating activities. This observation is further supported by data collected through other methods, such as informal talks with local villagers; most of them intend to use the forest mainly in dry season, as water is not available to practise agriculture. Here the forest is used as a safety net.

Furthermore, data from the questionnaire indicates that 86.5% of the households own less than 1,6 ha of land. This might not be enough to sustain their livelihoods from farming, since they are not allowed to extend their farmland and they therefore turn to forest products. This is supported by Sato, whose study shows that the amount of land under cultivation is strongly correlated with income dependency on forests (Sato, 2000).

Contribution of different forest products in the household subsistence

Five major forest products (established through focus group discussions) were ranked in the questionnaires based on the villagers' perceived importance to their livelihood (*see figure 5*). The results showed that firewood is the most important product they collect from the forest. The reason is most likely because, it is used as the only energy source for everyday cooking, because there is no any alternative source. It's also complimented by observations of firewood lots by every house and filled trucks on the roads. It's also triangulated with the activities of the seasonal calendar and focus group discussion information. Earlier study contradicts our findings by indicating that firewood is an important product but not the most (Flaherty *et al.*, 1993).

Figure 5: People's perception on importance of different forest products



(Source: questionnaire, n=37)

The second most important product is food for daily consumption such as vegetables, fruits, mushrooms and aquatic animals. Information was also obtained from the focus group discussion, where everybody agreed that the most important edible NTFP they collect is bamboo shoots while another important non-edible NTFP is firewood.

Timber and medicinal plants ranked third and fourth, respectively. Timber is collected for house construction and maintenance and therefore collected once or twice a year. Medicinal plants are seldom collected. Fodder is the least important product used for their livestock, because most of the cattle are fed on paddy straw and vegetable residues in the dry season and they allow for grazing in the forest during the rainy season.

Surrogate prices of forest products

Forest products are not, as mentioned earlier, collected for sale in Ban Khun Pae¹⁰. In an attempt to estimate the contribution of forest products commonly collected to the subsistence economy, an economic analysis using surrogate prices¹¹ is useful. A summarised result of the contribution is given on table 4 below.

Table 4: Estimated annual contributions of major five forest products to the household economy.

Products	Collected from the forest (year)	Contribution to Household Economy (per year)
Firewood	6 trucks	12000 Baht
Fodder	180 packs	1400 Baht
Vegetables	35% of total consumption	942 Baht
Medicinal Plants	33 bagfuls	3729Baht
Timber(when needed)	1 truck	255 Baht

(Source: informal talks with local people)

From these results, the value of forest products differed from the data on importance of forest products (*figure 5*). The value and the importance of firewood are found the same.

Collection and use of forest products

The local community's forest dependency has changed from farming in the forest to now only collecting products. They rely upon forests and their products¹² for daily subsistence.

Data show that the availability of NTFPs is less compared to the past. People's perceptions on the consumption pattern of forest products have not changed, in the sense that those who consumed food products from the forest in the past are still consuming these products today.

Utilization of forest as grazing land is however increased compared to the past. The reason could be increased population of livestock since people started to raise livestock for farming purposes.

¹⁰ Even if the community sold, it would be difficult to collect such data from them since people will be afraid to reveal the fact because of the fear of rules.

¹¹ Surrogate prices is the use of market prices for close substitute as a proxy measure of value for the un priced good or service being valued(FAO, 1998)

¹² The term forest products include all products from forests including timber, firewood and NTFPs.

The time of NTFP collection depends on the availability of labour and the seasonality of forest products (Arnold, 1995). The main occupation of most of the villagers is agriculture, thus the timing of labour availability can be determined from agricultural activities of seasonal calendar (*appendix2*). Nowadays, some people domesticate some herbals, vegetables and bamboo in their home gardens for daily use, as the amount collected from the forest is decreasing.



Collection of NTFP's

Timber

Villagers cut trees for timber from the utilization forest for their own needs, not for sale. If they do not find enough timber in the utilization area, they can go into the conservation area with permission from the village headman. There is no limit as long as they use the timber for construction of own house. Some of the species collected are *Alstonia scholaris*, *Dalbergia cultrate*, *Semecarpus cochinchinensis*, *Quercus sp* and *Lithocarpus sp*¹³.

Participant observation indicates a gradual change from bamboo house to huge timber houses.

Non timber forest products

Questionnaire results show that almost all the villagers are more or less depended on NTFPs. This is complimented by another study in the same region indicating that NTFPs play a crucial role in local livelihoods for subsistence (Salam *et al.*, 2005). The common NTFPs collected by the village are vegetables, spices and medicines (*see table 5.1, 5.2 and 5.3*).

In addition to plant products, aquatic animals like frogs, tadpoles, crabs, fish, bamboo worms and red ant eggs are also collected as a source of protein. Different kinds of mushrooms are also collected depending on the seasonality (*See appendix2*).

Finally, the forest is used for hunting birds, rats, rabbits and wild pigs.

¹³ Identification of species was done with the help of Gardner *et al.* (2000).

Vegetables and Fruits

In the past, people collected vegetables and fruits daily. They used to collect all the vegetables both during dry and hot season. Nowadays they are collected about twice a month. Mushrooms and fruits are collected during rainy season because of its availability. The reason for the collection from the forest instead of purchase is because forest vegetables and fruits considered as religious, delicious and chemical free products.

Table 5: Some of the commonly harvested forest plants and their uses

5.1. Fruits and Vegetables

Karen name	Scientific name	Use
Khua poo	<i>Piper sp.</i>	Flowers are cooked and eaten as curry.
Puli	<i>Musa sp.</i>	Flowers are cooked and stem is fed to pigs.
Salide	Unknown	Multi purpose: Earlier, fruits were used as soap: Currently, shoots are boiled and eaten as vegetables.
Samuju	<i>Spilanthus sp.</i>	Fruits are eaten in rainy season.
Poprella	Unknown	Young shoots are cooked and eaten.
Kolutu	Unknown	Flowers are used as balloons for small children. Also cooked and eaten.

(Source: focus group discussion and forest walk)

Medicinal plants and spices

Medicinal plants are collected all through the year. According to the village physician, most people are still reluctant to go to the hospital for daily sickness, as they believe the traditional treatment is more effective and safe. Spices such as those listed on table 5.3 are furthermore collected from the forest.

5.2. Medicinal plants

Karen name	Scientific name	Uses
Posa	<i>Zingiber sp.</i>	Young shoots are used as medicine
Grey cola	Unknown	Flower used as medicine for knee and waist ache
Boo ha pae	Unknown	Bark is used as sweeteners, fruit is used as a medicine for cough
No	Unknown	Drink the latex as medicine for malaria fever
Bla blow	Unknown	Cut the stem and drink the sap for curing cough
Min nom nom	Unknown	Bark is used as pain killer

(Source: Focus group discussion and forest walk)

5.3: Spices and other uses

Karen name	Scientific name	Uses
Pu ple-be	Unknown	Chewed with betel leaf to give the desired red colour and flavour
Ter-see-saw	<i>Cinnamon sp.</i>	Bark used as spice for cooking
Krungtedpa	Unknown	Leaves used as spice for cooking

(Source: Focus group discussion and forest walk)

Services

The people of Ban Khun Pae give importance to the sacred forest as a place for ritual activities, although not so much anymore. They used to treat the forest with some food for blessing of good harvest and they had the practice of treating the forest's spirit with food and beverage as a tradition of thanks giving. Although this was in the past, people still cannot collect anything in the sacred forest. Most of the villagers are furthermore afraid to go inside due to traditional Karen believes, which is also discussed by Neef and Schwarzmeier (2001).

Indigenous environmental knowledge

The local knowledge about the sacred forest and the functions of medicinal plants is passed down to next generations by taking their children into the forest. However, according to the Community Master Plan there is the problem of “continuation of traditions, [because] there is lack of attention for learning”. The solution must therefore be to “encourage the young generation to learn their traditions”. But what is then the future of using medicinal plants? Since Ban Khun Pae has a medical centre, does that mean future generations will

only use “western” medicines and not the “traditional” medicines? Already now there is a mix of the two. For example, a woman explained how her daughter was recovering from a cancer-operation using local medicinal plants. But *if* the local villagers start to depend less on medicinal plants, does that then imply a loss of indigenous environmental knowledge? And does that not mean the medicinal plants in the forest are saved? It is furthermore highly relevant in the discussion of the community forestry bill in Thailand, because “groups like the Karen (...) have become icons for the community forestry movements in Thailand. Traditional local practices such as tree ordinations and designation of sacred forests are increasingly used as symbols of local wisdom and instrumentalised in protests against government interventions” (Neef and Schwarzmeier in Neef 2005:17). The local knowledge is here being socially constructed to serve a political purpose and is no longer merely an issue of collecting forest products. Nevertheless, if the young generation in Ban Khun Pae does not want to learn the indigenous environmental knowledge, this knowledge is not necessarily being lost. It might have been transformed by the various social actors in the village, elders as well as youngsters. Furthermore, the Royal Project sometimes consults the local villagers about the recent scientific studies of the use of different medicinal plants. Thereby traditional environmental knowledge is viewed from different angles. Conclusively, this should not imply that knowledge is being lost; instead it illustrates the fact that knowledge is not a fixed category.

Chapter 6 Effects of utilization on the forest resource

Up to this point, the report has mainly focused on socio-economic aspects of PFM. Now, the focus will be on the quantifiable effects on the forest resource due to human activities. Acknowledged so far, villagers collect forest products often and hence the reason for forest inventory. The sampling was carried out in the three forest areas: conservation, utilization and sacred forest. Each of these areas was considered as stratum. The three strata were compared (each one regarded as an independent population) in terms of the estimates as mentioned in the method-section, using ANOVA test at 5% level of significance and in cases when it was significant, pair comparison of the strata regarding each indicator was carried out using LSD test. Secondly, all estimates from each stratum were combined to generate overall estimates for the whole forest in Ban Khun Pae.

Results from forest inventory

As can be seen in the table 6, the basal area, a measure of stand density, is higher in the conservation forest, followed by sacred forest and the utilization forest ranking last. However, the density of the trees, another measure of density follows the reserve order. This is because the conservation forest, apart from having the smallest density of trees it has the biggest trees, illustrated by the higher D_g (29.09 cm), meaning relatively small pressure to the big trees when compared to utilization forest. Indeed, the D_g follows the same order as the basal area.

Table 6: Variables and respective figures used to measure human effects in each stratum

Type of forest/ variable	Basal area (m ² /ha)	Density of trees (ha ⁻¹)	Density of saplings (ha ⁻¹)	Density of seedlings (ha ⁻¹)	Density of stumps (ha ⁻¹)	D_g (cm)	Mean number of species per plot
Utilization forest	19.41	737.50	4400.00	55625.00	256.25	18.19	13.25
Conservation forest	34.35	481.25	7700.00	43750.00	18.75	29.09	8.00
Sacred forest	24.71	637.50	6000.00	34000.00	0.00	22.20	16.00

(Source: forest inventory)

The differences of basal area and density of trees among the three strata were found to be statistical not significant at 5% of significance level ($p = 0.39$) and ($p = 0.22$), respectively. This means that the effect of the human activities on tree density does not differ significantly from stratum to stratum.

The conservation forest is the one with the highest density of saplings, the sacred forest ranked second and the utilization forest ranked last. This could be because the local community is not allowed to cut saplings in the conservation forest, while they are allowed to do so in the utilization forest. The sacred forest is conserved out of villager's traditional belief, so the possible disturbance to the saplings is when clearing the area for burial. However, this activity does not take place everyday and is perhaps why it has more saplings than in the utilization forest. Nevertheless, as in basal areas the differences are not statistically significant considered at 5% of level of significance ($p = 0.50$).

Non-significant differences were also found when comparing the density of seedling in all three strata ($p = 0.73$). It can be seen that the highest density was found in the utilization forest, probably due to the relatively large number and size of gaps. This is because of human activities creating favourable germination conditions (light) hence the establishment of the seedlings. Analogically, the relatively small density of the seedlings in conservation forest may be due to the crown of the big trees that shade the understory vegetation. Also in the sacred forest, big trees could hinder regeneration growth due to shading because it is here that the second biggest trees are found.



Plot demarcation

Illegal logging?

The differences between density of stumps, D_g and the number of species per plot in the three strata were found to be highly significant at level of significance of 5% ($p = 0.0029$), ($p = 0.033$) and ($p = 0.00014$), respectively.

As from the ANOVA test it was found that the differences are significant, pair comparison of the strata was carried out using least significant difference (LSD) test at level of significance of 5% for those variables, as shown in table 7.

Table 7: Comparison between density of stumps for each pair of strata using LSD test

Pair of strata	Difference between mean	LSD5%
UF X CF	237.5*	115.56
UF X SF	256.25*	141.53
CF X SF	18.75	141.53

(Source: forest inventory)

Table 7 shows that the number of stumps per unit area in the utilization forest is significantly different from the number of stumps per unit area in the conservation forest and sacred forest, however non-significative differences were found between the number of stumps per unit area in the conservation forest and sacred forest. The number of stumps in the utilization forest is 256.25 ha⁻¹ and 18.75 ha⁻¹ in conservation forest. The significantly higher number of stumps in the utilization forest than in conservation and sacred forest could be associated with interview data stating, that the villagers are allowed to cut the trees in the utilization forest for timber, house building, etc without any restriction, while in the conservation forest they have to ask for permission to cut any tree, a permission that can be accepted or denied (See chapter 4 on areas where PFM is practiced). In the sacred forest no one cuts the trees, which is why no cut stumps were found.

Table 8: Comparison between D_gs for each pair of strata using LSD test

Pair of strata	Difference between mean	LSD5%
UF X CF	10.90*	7.64
UF X SF	4.01	9.36
CF X SF	6.89	9.36

(Source: forest inventory)

Table 8 indicates that size of trees in the conservation forest (D_g = 29.9 cm) were found also to be significantly higher than in the utilization forest (D_g = 18.19 cm). This is because in the utilization forest all villagers are allowed to cut trees without a restriction and when tree stem is the main product, the larger trees are preferable than the smaller ones, decreasing the D_g.

Table 9: Comparison between species per plot for each pair of strata using LSD test

Pair of strata	Difference between mean	LSD5%
UF X CF	5.25*	1.87
UF X SF	2.75*	2.29
CF X SF	8*	2.29

(Source: forest inventory)

* Significant at 5% level

Usually, the preferable larger trees are from special species, meaning that when the main product from the forest is the tree stem for timber or house construction the exploitation is selective, that is why significantly higher mean number of tree species per plot were found in the sacred forest where there is not exploitation compared to conservation forest and utilization forest. The maximum number of species found in each stratum was 15 in the utilization forest, 8 in conservation forest and 17 in the sacred forest. See table 9 for the figures.

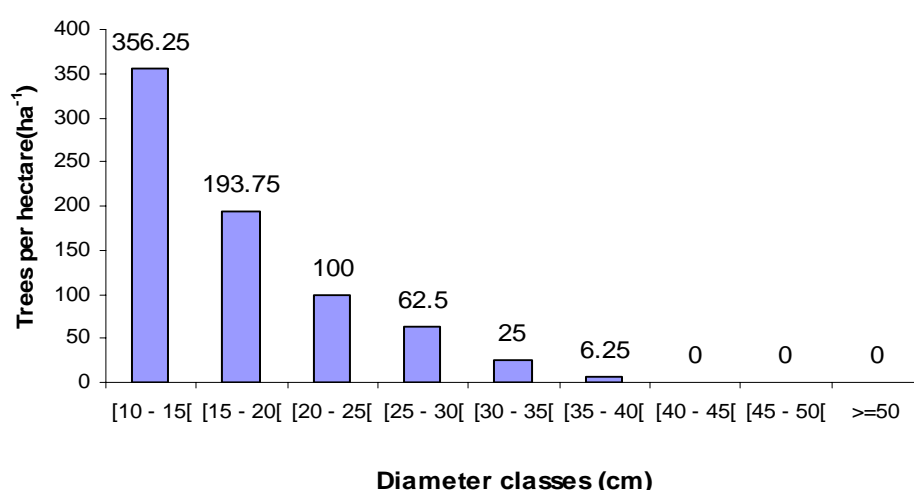
Regarding forest density, nothing can be concluded using the number of trees, because as mentioned by Philip (1983), the number of stems per hectare is a useful description of a forest but alone it does not define stand density, but with age, height or diameter it does reflect a picture of stand density. Furthermore, a forest standing at 500 stems per hectare if young and consisting of small trees may be quite open whereas a forest of 500 mature and big trees per hectare will be very dense or heavily stocked (*ibid.*).

Departing from the same idea, and as the number of trees per hectare were found to be non-significant, but the diameter of the tree with the mean basal area significantly higher in the conservation forest, followed by sacred forest, it can be stated that the forest density is higher in the conservation forest, followed by sacred forest and the utilization forest ranking last. This statement is supported by the basal areas of each stratum, although their differences among those strata were not found to be significant. The last place occupied by utilization forest is explained by the huge number of stumps found per hectare (256.25 ha^{-1}), associated with the villagers' use of the forest, that increase gaps. These gaps lead to the relatively large number of seedling per hectare - although not supported statistically.

Diameter distribution in each stratum

A diameter distribution curve was constructed for each of the three strata, for all tree species¹⁴. The figures 6, 7 and 8 show the diameter distribution in the utilization forest, conservation forest and sacred forest, respectively.

Figure 6: Diameter distribution for utilization forest

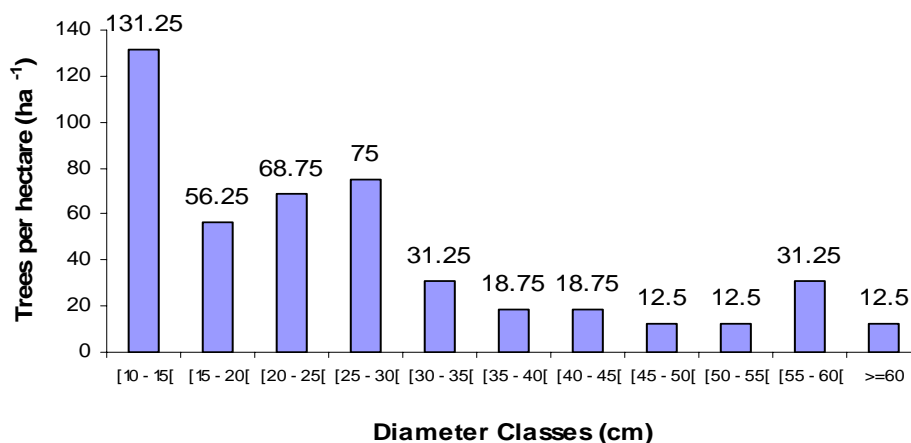


(Source: Forest inventory)

¹⁴ Although aware that one diameter distribution curve for each species would be better detailing and revealing but for the goals of this study a curve for all species is enough.

The curve for utilization forest follows the diameter distribution curve for an natural uneven – aged forest (Husch *et al.*, 2003 and Philip, 1983), the so called inverse j – shaped diameter distribution curve, that shows that each class diameter has fewer trees per unit area than the adjoint, smaller diameter classes. This means that each adjoint diameter class with large number of trees is a potential substitute of the trees that will be exploited, die or transit to the next class for the next diameter class. The lack of trees in the last five diameter classes (*figure 6*) when compared to the conservation forest (*figure 7*) is a clear illustration of exploitation for timber and house construction.

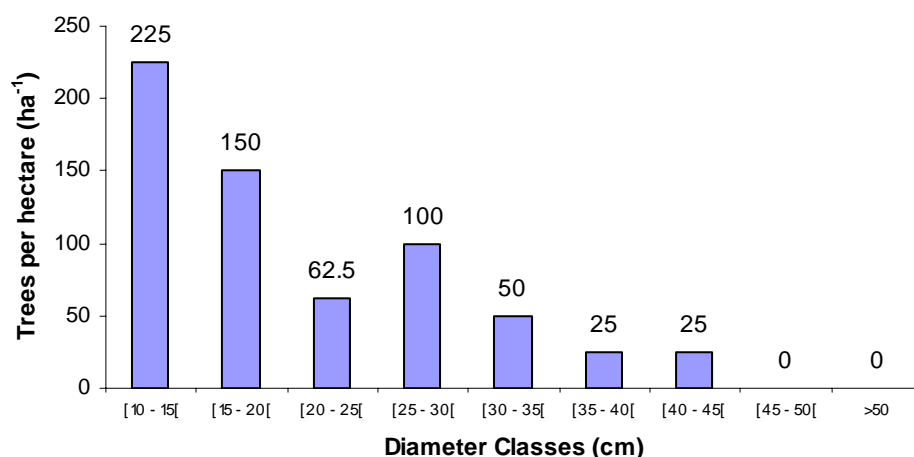
Figure 7: Diameter distribution for conservation forest



(Source: Forest inventory)

The diameter distribution curve for the conservation forest show considerably greater irregularities, it does not even follow the inverse j – shaped diameter distribution, reflecting perturbation that it has been subject to (*figure 7*). Perturbations are clear in the second and third diameter classes. Meaning that these classes will not be able to substitute the trees that will be exploited, transit or die in the following diameter classes. However, there are no diameter classes missing in this forest. This perturbation may be explained by illegal logging although not investigated to support the claim.

Figure 8: Diameter distribution for sacred forest



(Source: Forest inventory)

From the diameter distribution curve of the sacred forest (*figure 8*) it can be seen that there are four diameter classes missing when compared to conservation forest. The curve from sacred forest is more close to the inverse j – shaped diameter distribution. Misrepresentation of trees is only observed in the third diameter classes.

The lack of the larger diameter classes in the utilization forest can increase the pressure in the conservation forest, where can be found large trees that can be used for timber and house construction. Apart from being overexploited, the sacred forest has the potential to recover in the long run, since there are no diameter classes missing.

Combined estimates of all the forest variables

Table 10: Structure of the forest in Ban Khun Pae

Basal area (m ² /ha)	Density of trees (ha ⁻¹)	Density of saplings (ha ⁻¹)	Density of seedlings (ha ⁻¹)	Number of species found	Vertical structure
20	727	4540	55073	29	2 layers

(Source: Forest inventory data)

The figures in table 10 are considerably different from the results of a study by Lamotte *et al.* (1998) done in North-eastern Thailand in a similar vegetation (Dipterocarps forest) where they found basal area of 14.6 m²/ha, 37 species and 992 stem per hectare. These differences found may be due to different methodology used, differences in site, human influences, spatial distribution pattern and stage of development. Nevertheless, in this study the number of trees per hectare is almost equal to that found by Lamotte *et al.*

(1998). High differences are found in number of species and basal area and the number of layers was found to be equal in all strata.

Precision and accuracy of the forest inventory

The results in this study have high sampling error. The highest precision of estimates were found in the sacred forest where the sampling intensity were 4.025%, 7 times higher than in the utilization forest and 156 higher than in the conservation forest. The sampling errors in the conservation and utilization forest were all over 50% for estimative of each parameter. But in the sacred forest the sampling intensity were below 30%. The overall sampling errors were high, over 50% for all estimates of the needed parameters.

The number of sampling plots that would be necessary to have a sampling error of 20%, as recommended by Stellingwerf (1994) when the objective of sampling is not volume of valuable timber estimation were calculated and allocated to each stratum using optimum allocation. This was found to be, thirty seven 20 x 20 m sampling plots distributed as 33: 2: 2, in the conservation, utilization and sacred forest, respectively. The large number of sampling plots needed in the conservation forest is an indicator of the large area and high variability in this forest.

Chapter 7 How does utilization and management affect local people's livelihoods?

As our main research question indicates, the role of forests in people's livelihoods was our main interest. This chapter therefore brings together our general analysis and relates to the livelihood aspects that we observed in the village.

Forests and Livelihoods: The five capitals' approach

Natural capital

Ban Khun Pae is surrounded by large thick forests. However, the agricultural land per household is approximately 0.9 ha which was considered relatively small for a growing population. Forests are also experiencing high fire incidences especially in the dry season, an observation we made and confirmed by a large inter committee meeting seeking to address fire problems which we attended in Chom Thong. The effect of fire on air pollution in northern Thailand is also well evidenced by thick cloud of smoke in the northern capital of Chiang Mai, hence drawing international attention. At this rate, there is an urgent need to address these threats to the natural capital, and PFM has a greater role e.g. in effective fire control in the region, if the big natural capital base is to be prevented from further loss.

Physical capital

The basic infrastructure in Ban Khun Pae includes one health clinic where the villagers can get free treatment and medicine. This could, as mentioned, probably shift the demand of forest related medicinal value to prescription medicine. However, the local community still use the medicinal plants, for reasons described below.

“.....because we are already used to it, we like it and we can take it continuously for our health reasons without side effects..” Kiamakoo, a village woman.

Roads are another important factor we looked at, due to their big role in transportation of forest products, especially firewood. There exists some clear roads to get in and out of the forests, however, the roads are impassable during the wet season, so the village collect enough firewood and ferry it with trucks to consume for the big part of the year.

Social capital

We found the village well endowed with a social capital that is manifested by the various groups and committees that work together within the local community. It is a big milestone to see them so deeply

involved in the management of an area that was declared protected without their consultation and there are clear village rules that guide them to do so. In the stakeholder analysis, we counted eight stakeholders who are working with the local community at various levels. JoMPA was seen to play a vital role in bringing together other NGO's who have experience in community organisation and development.

Human Capital

The local community was found to have a wide array of skills in forest utilization and management. These range from fire control and management to collection of NTFP's and general organization into a community that can be responsible for the forests resource. They use the forest to transfer skills such as weaving (by use of raw material such as leaves and barks from the forest) and preparation of local medicine from medicinal plants. However, as mentioned, the young generation is not interested in learning the "old fashioned skills" and therefore the older generation expressed fear of loss of knowledge with time. Research should therefore step in and document the knowledge.

Financial capital

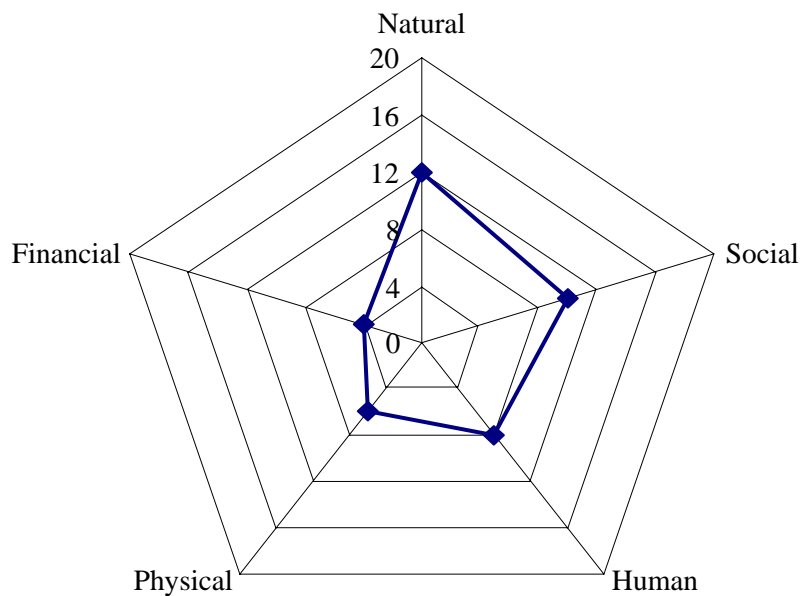
The village is highly dependent on agriculture as a major source of income for their daily lives (*see figure 4*). Our major weakness for the study on financial capital was that we did not investigate whether the local community has access to credits and whether this forms part of the contribution to their livelihoods. Whether agriculture is enough for the households to use and save was also not investigated. We can however link the factors that we were able to investigate that plays a major role in agriculture which is a major source of livelihoods as discussed below. The current relationship between agriculture and forestry is mainly on the supply of water (from watersheds) for irrigation during the dry seasons. Another important factor is the use of organic manure derived from the forest to enhance agricultural production. However, availability of forests has been argued to provide products and services, while cutting the same can also lead to sustainable incomes through agriculture (Chomitz, 2007). Financial capital from forestry is therefore complex.

Through PFM activities, the villagers get waged labour, e.g. in plantation of vetiver grass to control soil erosion, reforestation projects in the hills, etc. Some stakeholders also give annual allocation for forestry activities which buys the villagers lunch during PFM activities e.g. making of firebreaks. The local community also gets money through a fine which goes to the village account.

Summary on five capitals:

The five capitals were then weighted and ranked using the five capital approach and the criteria used by CIFOR (See Appendix4). The approximated pentagon for Ban Khun Pae would appear as shown below:

Figure 9: Estimated "five capital pentagon" for Ban Khun Pae



(Source: Overall analysis of findings)

The analysis above on capitals lacks some important aspects such as an analysis on how the local community is susceptible to natural disasters and how they overcome it although it was done in the field. This is due to the fact that the group member who was responsible for the analysis of this section left prematurely and time was not on our side to communicate with her from Turkey and complete the section as it would be expected.

Conclusions

This report has looked into how PFM is practiced in Ban Khun Pae and how this affects local people's livelihood. The following conclusions draw upon the role of forests to livelihoods already discussed in chapter 7. In addition, the following major points were discussed:

Participatory forest management (PFM) as is practised in Ban Khun Pae is an umbrella of many activities involving both management and utilization aspects. These activities are carried out in three major classifications of forest areas in Ban Khun Pae: conservation, utilization and sacred forest. These classifications are however a mimic since legally, Ban Khun Pae is in a protected area.

On local community perceptions about PFM, it was difficult to draw a clear boundary on whether they are satisfied or not. Some of the reasons cited as positive about the current PFM practices were that the forest cover is now increasing and that they can preserve it for the future generations. On the bad aspects, PFM involved too much bureaucracy and also some NTFP products, e.g. vegetables have decreased from the forest so much that they cannot collect enough for their own consumption.

Our analysis on stakeholders shows that the local community is to a large extent being used to achieve other stakeholders' interests. The community is disempowered by their position as "authorised users" of a resource they cannot claim any rights over legally. They therefore listen to anyone with an offer of helping them, since they have no rights, and the privileges they enjoy now can be insecure without legal documentation and possibilities of challenging the same in a court of law. Nevertheless, they find themselves in control of most PFM activities and see it as a social responsibility.

The local community relies much on the forest for the supply of very important commodities: firewood and timber for construction. The firewood is the most important product collected from the forest. For food production and cash income however, agriculture play a greater role, because the village rules forbid any sale of forest products.

The use of forest for timber, firewood and other NTFP's has had a direct impact on the forest resource. This is supported by the data on forest inventory which shows different forest densities according to where the local community is allowed to access and withdraw forest products. The utilization forest is the most affected by the human activities, due to rights of access and withdrawal (by *de facto*) granted to the local community

Conservation forest showed to be the most perturbed forest. This is an indication of poor management but not density of the forest. High number of species was found in sacred forest, utilization forest and

conservation forest respectively. It is expected that the pressure in the conservation forest will increase due to the lack of larger trees in the utilization forest.

Overall, this study shows that PFM is important for improving local people's livelihood and conservation of forest resources.

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Appendices

Activity sheets

Marie Bæk Iversen

Tuesday 6.3.	The whole group met the village headman and we introduced our project. Worked on the questionnaire. At night, focus group discussion, where the participants made a land use mapping over different forest types/uses.
Wednesday 7.3.	Transect walk with woman from the village. Informal group discussion followed by forest walk with two villagers. Tested the questionnaire on one villager. Reorganised methods. Had super-vision. A former-SLUSE student gave a presentation of his work on land use changes in Ban Khun Pae. After dinner, focus group discussion with committee and non-committee members (men only).
Thursday 8.3.	Focus group discussion in the morning (women only). Typed in data so far and reorganized the questionnaire. Started on the questionnaire. Group meeting.
Friday 9.3.	Conducted questionnaires. Typed in data. Obtained land maps and official documents from village TAO representative.
Saturday 10.3.	Conducted questionnaires. Semi-structured interview with village headman and elder. Organized presentation for Sunday mid-evaluation.
Sunday 11.3.	Typed in data. Prepared all materials for focus group discussion. Presented our work so far for teachers and other students. Focus group discussion at night (women only).
Monday 12.3.	Conducted questionnaires. Arranged FGD at night, but no one showed up, group meeting instead. Then fire broke out at a house in the village and we all helped.
Tuesday 13.3.	Forest walk with women from the village, informal talks about medicinal plants and other NTFPs. Group meeting about what data we were missing.
Wednesday 14.3.	Focus group discussion with men from the village. Three semi-structured interviews: one with a village committee member, one with the local TAO representative and one with a non-committee member. Typed in data.
Thursday 15.3.	Typed in data. Went to village and gave the couple with the burned house our donation-money. Farewell meeting/party at night in the community hall.

Susan Chomba

6 th March	Morning: Travel from Chiang Mai to base camp. Afternoon: Arrival at base camp: Drive around the village Introduce ourselves to the village headman Evening: Focus group discussion on how the village is organised
7 th March	Morning: Transect walk in the sub villages and forest, focus group discussion (Areas where PFM is practised) Afternoon: Questionnaire testing, presentation by a PhD student who had just completed his work on land use changes in our village Evening: Adjusting questionnaire, attend focus group discussion with men only.
8 th March	Morning: Focus group discussion with women only Afternoon: Start questionnaires Evening : Group meeting, Typing data and re adjusting of questionnaire
9 th March	Morning: Travel to Chomthong for interviews Afternoon: Interviews with Ob Luang National park superintendent, TAO office, Agriculture extension officer Evening: Discussion with group members and typing in interview data
10 th March	.Morning: Questionnaires Afternoon: Interview with National park guard, Mr. Kamnoon Evening: Preparation for midterm evaluation
11 th March	Morning: Data compiling and preparing for presentation Afternoon: Midterm evaluation (Presentation Evening: Focus group discussion
12 th March	Morning and afternoon: Forest sampling (Sacred forest) Evening: Fire broke out in the village while we were waiting for the villagers to come for Focus group discussion; we all went to help put off the fire.
13 th March	Morning and afternoon: PRA (NTFP collection with a group of 6 women, we start from the village to the mountain peak, collecting vegetables, medicine and asking questions regarding areas of collection and amounts. Also participant observation on forest activities. Evening: Relaxing with a beer.
14 th March	Morning and afternoon: Focus group discussion and stakeholder analysis Evening: Group meeting and Compiling data
15 th March	Morning: (Group discussion and data compiling :): Afternoon: Visiting a household whose house go burnt up and presenting our donations Evening: Thanksgiving to the villagers in the community hall, characterized by pomp and dance!

Others: Interview with JoMPA, IMPECT in Chiang Mai after base camp.

Thanussa Thuraisingam

Tuesday 6.3.	We arrived in the base camp. In the evening visited our village, done self introduction with village head man and on the same day and we conducted the method of community mapping to know the boundary of different forest and their location.
Wednesday 7.3.	Transect walk and informal talk with village guides from their farms to community forest and then to conservation forest to know the area and vegetation type and to get an idea about selecting the plots for forest inventory. Reorganised methods. Had super-vision. A former-SLUSE student gave a presentation of his work on land use changes in Ban Khun Pae.
Thursday 8.3.	Forest inventory in community forest. We laid out four plots in the same. Collection of data, informal talks with village guides
Friday 9.3.	Forest inventory in conservation forest. We took four plots here too. Collection of data, informal talks with village guides
Saturday 10.3.	Conducted questionnaires, The data entry to computer, preparation for mid term evaluation. Identification of species, their Karen name and scientific name.
Sunday 11.3.	Data entry and after noon mid term evaluation. Focus group discussion with women only to know the information on NTFP collection
Monday 12.3.	Conducted questionnaires. Arranged focus group discussion at night, to know the forest mapping of the area but unfortunately we couldn't because of the sudden outbreak of fire in one of the house of our village.
Tuesday 13.3.	Forest walk with women from the village, informal talks about medicinal plants and other NTFPs. Group meeting about what data we were missing. Then identification of species, their Karen name and scientific name.
Wednesday 14.3.	Focus group discussion with men from the village to do the stake holder analysis. In the afternoon we did seasonal calendar with men and women in the village church.
Thursday 15.3.	Typed in data of questionnaires and then went to the village to give the money to the household who had a fire incidence in their house. Afternoon cleaning of the base camp and in night fare well party in the village community hall.

Tuesday 6.3.	We arrived in the base camp. In the evening gone to our village, done self introduction with village head man and on the same day we conducted community mapping to know the different forest and their location.
Wednesday 7.3.	Transect walk with village guides from their farms to community forest and then to conservation forest to know the area and vegetation and to get an idea about selecting the plots for forest inventory.
Thursday 8.3.	Forest inventory in community forest. We took four plots in the same.
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Saturday 10.3.	The data entry to computer and the preparation for mid term evaluation.
Sunday 11.3.	Data entry and after noon mid term evaluation.
Monday 12.3.	Forest inventory in sacred forest. We took two plots in the same which was near by the village. In the evening we planned mapping of the area but unfortunately we couldn't because of the sudden outbreak of fire in one of the house of our village.
Tuesday 13.3.	The details of 30 questionnaires were entered to the excel sheet for analysis. Then identification of species, their Karen name and scientific name.
Wednesday 14.3.	Focus group discussion with men from the village to do the stake holder analysis. In the afternoon we did seasonal calendar with men and women in the village church.
Thursday 15.3.	Morning went village to give the money to the household who had a fire incidence in their house. Afternoon cleaning of the base camp and in night fare well party in the village community hall.

Tarquinio Magalhaes

Tuesday 6.3.	We arrived in the base camp. In the evening gone to our village, done self introduction with village head man and on the same day we conducted community mapping to know the different forest and their location.
Wednesday 7.3.	Transect walk with village guides from their farms to community forest and then to conservation forest to know the area and vegetation and to get an idea about selecting the plots for forest inventory.
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Thursday 15.3.	Morning went village to give the money to the household who had a fire incidence in their house. Afternoon cleaning of the base camp and in night fare well party in the village community hall.

Synopsis

FOREST MANAGEMENT IN NORTHERN THAILAND-BAN KHUN PAE



Interdisciplinary Land Use and Natural Resource Management (ILUNRM)
SLUSE Field Course

February – April 2006
University of Copenhagen and Roskilde University

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1. Introduction

1.1 Thematic background

Thailand's forest cover has had a drastic change from 53.3% in 1961 to 15% in 2002 due to various factors such as commercial logging, shifting cultivation, dam and road construction, expansion of agricultural land and land resettlement (Puginier, 2002). This has had effects on forest management practises and especially the commercial logging ban of 1989 (Laknavichian, 2001).

The highlands of northern Thailand are a prime example where different management regimes have resulted from changing forest policies (Puginier, 2002). Some policies have favoured participatory methods of forest management such as community forestry (Sutthisrisilapa, 2004). However, the community forest management bill has not been legitimized even though it has been practised by local community and enjoys *de facto* rights (Thorsten Treue, pers. Comm.). Nevertheless, the people's rights of access and withdrawal remain unclear (Sutthisrisilapa, 2004). Knowledge on local people's perceptions on the different kinds of forest management regimes and what impact they have had on their livelihoods is also lacking, therefore our research departs from here. Figure 1 (see below) illustrates the ideas behind our study, and how they interrelate with each other.

De jure and de facto rights

The *de jure* rights are the explicit legal ownership, trade and used rights that determined by the state, which are only consistent with the *de facto* property rights to the extent that they are enforced.

The *de facto* property rights are those which are observed to be actually in operation and hence affect resource allocation individual decisions (Adger, W. N. and Lutrel, C. 2000)

1.2 Local Context

1.2.1 Ban Khun Pae

The research will be carried out in the village of Ban Khun Pae and a small sub-village next to Ban Thon Phung which are situated in the highlands south of Chiang Mai. The villages consist of 108 households and the total population is approximately 420 people. The villages are situated in a densely forested area (SLUSE report, 2007). The ethnicity of the villagers is mostly Karen. In terms of general discourse on the Karen people's connections with forests, they, along with other hill tribes, have long been identified as 'forest eaters' (Gravers in Sato, 2000).

1.2.2 Ob Luang National Park.

This covers an area of 553 sq km and was declared as a national park in 1991. However, in absence of clear physical boundaries of the 'Protected Areas' (PAs), combined with the limitations of public resources to patrol the areas to prevent intruders, the entry to the PAs are more or less open access (Nabangchang, 2003).

2. Overall question

In what ways do current forest management regimes influence local people's livelihoods in the village of Ban Khun Pae?

2.1 Research questions

1. What are the current forest regimes and how do the local people perceive them?
2. To what extent are the local people dependent on the forest resources?
3. What are the effects of the location of Ob Luang National Park boundary to the local people use of the forest resource?
4. How do the local people's activities inside the forest affect the forest resources in the National Park?

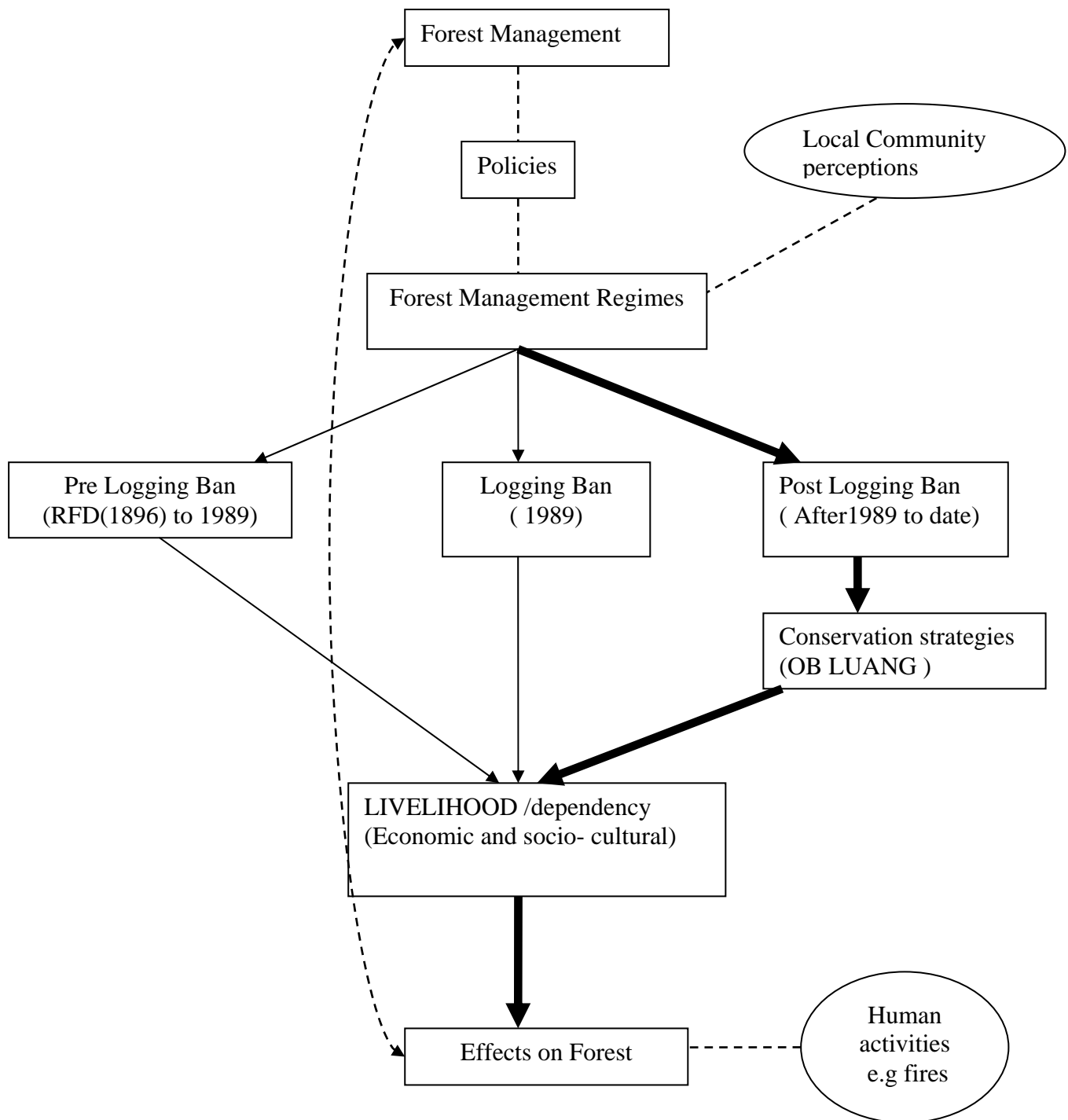


Figure 1: Shows our thematic flow from the title to the main research objectives. The dark arrows indicate the main research ideas while normal arrows other points of consideration during the study which are interrelated with the main idea. Broken arrows indicate Local community's position in the study with regard to forest management.

3. Methods

Methods to be used in this research are a combination of qualitative and quantitative methods. This way, it is going to be possible to use the different strengths in the interdisciplinary of the group. Generally, since an interpreter is going to be used when conducting most of methods, it is important to be aware of his/her personal opinion, which might influence the interpretation. The following is a discussion of the methods planned to use.

3.1 Qualitative methods

PRA-methods

According to Mikkelsen (2005) PRA (Participatory Research Approach) covers many different methods to use in the field and is therefore best understood as a toolbox of methods. It is normally practiced within development projects, although also used by researchers conducting fieldwork. Many of the methods chosen to use in our research have all in recent years been categorized as part of the PRA-toolbox, due to the participatory approach they entail (ibid.). Focus group meetings with local community members will be arranged of 8-10 people each and they will be asked to do the following four methods:

#1 Community History (Time Line)

This is a chronological description of important events which occurred in the community's past and up to the present (Selener, D. *et al* 1999). It is commonly used to depict an aggregate of the various landmark events as perceived by the local people (Mikkelsen, 2005). This method is going to be used to obtain information about whether and how the villagers experienced the different forest management regimes on a local level, hereunder how access and withdrawal rights have changed over time.

#2 Seasonal Activities Calendar

This method helps to identify livelihood tasks and to categorize responsibilities by season, gender and intensity of activity (Selener, *et al.*1999). With this method it is planned to obtain information on the forest activity, in which time of the year and done by whom.

#3 Preference and problem ranking:

These methods facilitate the identification and analysis of preferences and problems identified by the villagers (Selener, *et al.* 1999 & Mikkelsen, 2005). The methods will be used to identify main problems, opportunities and preferences of the community regarding main income generating activities such as farm, non-farm, and forest utilization. A problem ranking will also be made according to the use of the forest resource in relation to access and withdrawal rights.

#4 Social Mapping

This method is a visual method conducted by the community (Mikkelsen, 2005). The purpose is to identify the well-being of the households with the local criteria. This method will be used to identify the level of well-being of the community by using local criteria. Through this method the community will be divided by three sub-groups such as upper class, middle class and poor.

During the implementation of the methods, if it is necessary, the local people will be divided by gender or other criteria.

Transect Walk

The method is a transverse cut of the community in which various technical and production-related aspects can be identified (Selener *et al*, 1999). With this method, the group will walk in the village, in and around the forest to make observations, which can afterwards be clarified in interviews.

Focus Group Discussion

A Focus Group Discussion (FGD) is a way of listening to people and learning from them. It gathers together people from similar backgrounds or experiences to discuss a specific topic of interest for the researcher (Dawson et al., 1992). Conducting a FGD is aided in understanding social roles, attitudes and context within the village. The method will be used because it reveals different perceptions and attitudes towards the research topics. When carrying out a focus group discussion it is needed to be aware of on what criteria participants are being recruited and where the session takes place.

Semi-structured interviews

The semi-structured interview is an interview closer to a conversation, yet still controlled and structured (Mikkelsen, 2005). The data obtained from interviews will be used to triangulate with the data from the questionnaire. This method was chosen because it is important to be aware of how words are culturally perceived and context-specific (Spradley, 1979). Conducting interviews therefore give an opportunity to get data on how the local villagers themselves understand local categories. The respondents will be selected based on a snow balling technique. A sampling technique that involves asking a key informant name other people who should be contacted by the investigator in order to understand some aspect of a situation under study (Carvalho S. et al 1997).

Participant observation

This method has many definitions according to disciplines and traditions. “participant observation is a method in which an observer takes part in the daily activities, rituals, interactions, and events of the people being studied as one of the means of learning the explicit and tacit aspects of their culture” (Dewalt et.al ,1998:260). The limitation of this method could be an argued that mutual trust between people and the

understanding of indigenous categories can only be created over time. Since there are only ten days for field work, this is worth remembering. Moreover, it might also be difficult to separate daily routines from special occasions. Consequently the method can never stand alone, but must be combined with other methods, such as interviews and informal talks, which will be conducted (Dewalt *et.al.*, 1998). Although a more constructed version of the participant observation will be the transect walk .

Secondary data

The use of documents in this research supplements the interviews regarding different understandings of forest management regimes. Hammersley and Atkinson (1995) argue that it is important to view documents as social aspects of the study context. Documents will aid in viewing the difference between ideology and practice. When reading documents it is needed to be aware of e.g. how did negotiations take place, who were involved and who were not involved.

3.2 Quantitative methods

Questionnaire

Household questionnaire will be conducted in order to gather data on all the research questions. It will consist of mostly close-ended questions, although combined with open-ended question to make room for the respondent's personal opinion on certain matters. The sampling design to be applied for household selection is random cluster sampling. The cluster is the household, will be taken into consideration, therefore, two respondents, husband and wife, where they are both present and a husband or wife where one is absent.. So, the sample unit is the cluster (a household) and the sub-sampling units are household heads. The reason of choosing this design is that it is time saving. (Freese, 1984; Husch et al, 2003).

GPS mapping

GPS stands for Global Positioning System. In this research the method will be used for defining the specific area of the village in relation to the boundary of Ob Luang national park. Used in this way the method will be combined with transect walks with local villagers. The purpose of the combination is because the boundary is not physical visible and we will therefore examine if the local villagers' understanding of where the boundary is correlates with the actual official boundary.

Forest Sampling

A small forest sampling following the gradient of human influence will be carried out. The gradient is supposed to decrease from the boundaries to the inner part of the national park. So nine 0.025 ha (10 x 25 m)

temporary sampling plots will be lay down following the gradient. Three of them will be established in the outermost part, three in the intermediate part and the last three in the innermost part of the park. The reason for conducting this survey is to evaluate the effects the local villagers' use of forest products has had on the forest resource. The method will be used to triangulate the interviews and questionnaires. (Husch, *et al.*, 2003)

3.3 Research questions and relevant methods

Research question no. 1 concerns the current forest management regimes and how local people perceive them. The question is thus subdivided into two parts. The first part is about the forest management regimes and the second part about the local people's perception.

To answer the first part of this research question (current forest management regimes) the following data are needed:

- Historical changes/timeline in forest management regimes
- Policies that have influenced the changes
- For whom have the policies been implemented
- Management, access and withdrawal rights – what is *de jure* and what is *de facto*
- Bundle of rights within the community

The following **methods** and **respondents** will be used:

- Semi-structured interviews with key informants (see appendix 5):
Royal Forestry Department (RFD) staff member
NGO representative operating in the area
- Secondary data:
Literature review
Official documents from the RFD
- Focus group meeting with local community members

Both data from focus group meeting and the interviews will be triangulated with the secondary data

To answer the second part (local people's perceptions) we need data on the following:

- Local people's understanding of the regimes
- Historical timeline of forest management
- *de facto* versus *de jure* management

The following **methods** and **respondents** will be used:

- Focus group meeting with local community members including:
community history (time line)
- Semi-structured interviews with local community members (see appendix 5)
- Questionnaire with households

Using these methods, we make sure that many different voices are being heard, since some people might choose not to talk in the focus group, but will do so in an individual interview or in the questionnaire.

Research question no. 2 concerns how the local people depend on the forest products.

To answer this question the following data are needed:

- Forest products collected
- Access and withdrawal rights
- Socio-cultural value of the forest
- Major income sources

- Demography and migration

The following **methods** and **respondents** will be used:

- Questionnaire with households
- Focus group meeting with local villagers including:
Preference and problem ranking
Seasonal calendar
Social mapping
- Participant-observation
- Semi-structured interviews with villagers (see appendix 5)

Research question no. 3 is about the boundary of the Ob Luang National Park and its effects on the local community. To answer this question we need data on the following:

- Boundary position
- Products collected from different areas of the surrounding forest
- Features of the boundary
- Villagers' understanding and experiences on the location of the boundary
- The process of decision-making
- Local involvement before, during and after implementation of the boundary/National Park
- Changes in access and withdrawal rights due to the location of the boundary
- Extraction before and after the boundary
- Official control on the boundary

The following **methods** and **respondents** will be used:

- GPS mapping in combination with transect walk
- Questionnaire
- Focus group discussion with 6-8 local villagers (see appendix 6)
- Semi-structured interviews with local villagers (see appendix 5)
- Participant observation

Research question no. 4 concerns how the local people's activities inside the forest influence the forest resources in the national park. To answer this question the following data are needed:

- Human activities:
 - i. Firewood collection,
 - ii. Extraction in general,
 - iii. Traces of fire
- Effects on forest resources:
 - iv. Smoke,
 - v. Ash or burn areas,
 - vi. Species richness,
 - vii. Density,
 - viii. Tree sizes,
 - ix. Stock of regeneration,
 - x. Number of stumps.

The following **methods** and **respondents** will be used:

- Forest sampling (see appendix 2),
- Questionnaire with households
- Transect walking
- Semi-structured interview (see appendix 5),
RFD staff member
NGO representative in the area
Local community members

4. Utilisation of disciplines

Teams	Names	Background	Main Contribution to the report
Team 1: Economic, socio-cultural and political	Marie Bæk Iversen	Anthropology	Social structures, power relations, cultural perceptions of the environment
	Adalet Budak	Economics	Economic aspects of livelihoods
	Susan Chomba	Forestry	Forest conservation vs utilization, forest policies and management regimes
Team 2: Forest inventory	Tarquinio Magalhaes	Forestry	Forest sampling and statistical analyses
	M. Nishal	Forestry	Forest protection and sampling
	Thanussa Thuraisingam	Biology	Species diversity, identification and utilization

Beside the above disciplines we will be accompanied with the Thai counterparts whose disciplines are yet to be known from the field. We hope they will be more or less our same disciplines and they will also be contributing to our present project especially in a local perspective.

5. Time schedule

ACTIVITIES	DAYS (MARCH)										Working team
	6	7	8	9	10	11	12	13	14	15	
Arrival at the base camp											All
Arrival at Ban Khun Pae and introduce ourselves and our project to villagers											All
Transect walk for observation											All
Choose the plot for forest sampling based on the transect walk											All
Pilot questionnaire survey											All
Forest sampling											Team 2
Focus group meetings with five PRA methods											Team 1
Focus group discussion											Team 1
Conducting semi-structured interviews											All
Conducting questionnaire survey with sample households											All
Participant observation											All
Filling the missed data											All
Evening meetings											All

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5. APPENDICES

Appendix 1: Summary of the methods

Research question	Data required	Methods	Respondents/source of data
What are the current forest management regimes and how do the local people perceive these?	<p>Historical changes;</p> <p>Policies that have influenced the changes;</p> <p>For whom have the policies been implemented;</p> <p>Management, access and withdrawal rights – what is <i>de jure</i> and what is <i>de facto</i>;</p> <p>Bundle of rights within the community;</p> <p>Local people's understanding of the regimes;</p> <p>Historical timeline of forest management;</p> <p>De facto versus de jure management.</p>	<p>Semi-structured interviews with key informants;</p> <p>Secondary data;</p> <p>Focus group meeting with local community members;</p> <p>Focus group discussion with local community members;</p> <p>Semi-structured interviews with local community members;</p> <p>Household questionnaire.</p>	<p>RFD staff member,</p> <p>NGO representative operating in the area;</p> <p>Members of community (Villagers);</p>
To what extent are the local people dependent on the forest resources?	<p>Forest products collected;</p> <p>Access and withdrawal rights;</p> <p>Socio-cultural value of the forest;</p> <p>Major income sources;</p>	<p>Household questionnaire;</p> <p>Focus group meeting with local villagers including: Preference ranking, Seasonal calendar, problem ranking and social mapping.</p> <p>Participant-observation;</p>	<p>Members of community (Villagers);</p>

	Demography and migration	Semi-structured interviews with villagers.	
What are the effects of the location of Ob Luang National Park boundary to the local people use of the forest resource?	<p>Boundary position;</p> <p>Products collected from different areas of the surrounding forest;</p> <p>Features of the boundary;</p> <p>Villagers' understanding and experiences on the location of the boundary;</p> <p>The process of decision-making;</p> <p>Local people's perceptions of the boundary (pros and cons);</p> <p>Local involvement before, during and after implementation of the boundary/National Park;</p> <p>Changes in access and withdrawal rights due to the location of the boundary;</p> <p>Extraction before and after the boundary</p> <p>Official control on the boundary.</p>	<p>GPS Mapping in combination with transect walk;</p> <p>Focus group meeting with local villagers including: Social mapping;</p> <p>Focus group discussion with 6-8 local villagers;</p> <p>Semi-structured interviews with local villagers;</p> <p>Participant observations.</p>	<p>Members of community (Villagers);</p> <p>Forest</p>
How do the local people's activities inside the forest influence the forest resources in the National Park?	<p>Human activities: Firewood collection, extraction in general, traces of fire</p> <p>Effects on forest resources: Smoke, ash or burn areas, species richness, density, tree sizes, stock of regeneration, number of stumps.</p>	<p>Forest sampling;</p> <p>Transect walking;</p> <p>Semi-structured interview with local people, RFD staff member and NGOs</p>	<p>RFD staff member;</p> <p>NGOs;</p> <p>Villagers;</p> <p>Forest.</p>

Appendix 2: Forest sampling design and description

A small forest inventory following the gradient of human influence will be carried out. The gradient is supposed to decrease from the boundaries to the inner part of the park. So, nine 0.025 ha (10 x 25 m) temporary sampling plots will be lay down following the gradient. The sampling design to be applied will be Stratified Random Sampling; the criterion to stratification is the gradient of human influence. As there is not information about size of each stratum, size of the total area and variability of each stratum and of the whole area from the previous studies the allocation of plots to each stratum will not be proportional neither optimal, so, in each stratum will be established three sampling plots. Three plots in the outermost part, three in the intermediate part and the last three in the innermost part of the park. Each sampling plot will be divided in five 0.005 ha (5 x 10 m) subplots. The seedlings and saplings as defined by Husch et al (2003) will be assessed in each second subplot. The sapling and adult trees will be assessed in the entire sampling plots.

While in the field, one day walking through the forest to recognise it and delimited the strata will be necessary. The strata will be delimited while walking towards the core part of the forest by seeing the changes in forest density that is an indicator of human influence. The points where the vegetation density changes to another will be marked with GPS, it will facilitate the establishment of the plots in each stratum, in coming days.

First of all, all three strata will be compared (each one regarded as independent population) so that it can be found if there is any difference in respect to human influence. Using ANOVA and LSD test or t test it will be tested whether these differences are statistical different, in other words, it will be found out whether the human influence to forest resources vary from the boundary to the core part of the forest/park. Secondly, to have an overall view and estimates of human influences to forest resources the three estimates from each stratum will be combined; all tree strata will be considered one population only.

Indicators of the human influence/ data required:

- *Number of trees per hectare (density),*

It is expected that the number of trees per unit of area will increase from the boundaries to the core part of the forest, i.e.: the more closer the people are to the forest the more human influence we have and the more disturbance to the forest, affecting negatively its density.

- *Number of species per hectare (species richness, species diversity),*

Generally, the use of the forest products is selective, i.e.: there are species that are much demanded than others. The closer this species are to the local community the more harvested they are meaning that the lower will be the number of species per unit area. Thus, the number of tree species is expected to increase as the human influence gradient decreases.

- *Number of stumps,*

The number of stumps can also be used as an indicator of human influence, it denotes exploitation. But as tree logging is not allowed in the park, it may not be a good indicator and one can expect to find many stumps in the inner part of the park, because it is where one can log the trees without being encountered by the patrol team, for example.

- *Density of regeneration (coppice, seedlings and saplings)*

The more are human activities in a forest the less likely are the regeneration to survive, because the more is the disturbance, being the regeneration, especially the seedlings the most vulnerable as they are not established yet.

- *Size of the trees (Diameter at breast height)*

In forest exploitation, when tree stem is the main product, the larger trees are preferable than the smaller ones, so that the absence of trees with relatively bigger diameters can be used as indicator of human influence in the area. And it is expected that the closer the forest is to local community the few big trees we will have.

- *Vertical structure (what is the dominant stratum in each sampling plot: canopy stratum, intermediate stratum or understory stratum?)*

When the forest logging or tree cutting is not allowed the local community rely on NTPFs and it affects much the understory and the intermediate strata, so the vertical structure (the lack of understory stratum) can be also used as any indicator of human influence in forest resources.

Appendix 3: Sample booking sheet for forest Sampling

Plot number _____ Latitude _____ Longitude _____ Altitude _____

Trees	Species	DBH
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		

Number of stumps:

Number of coppices:

Number of seedlings:

General observation

Appendix 4: Questionnaire for local community

(Before going to ask the questions, we shall introduce ourselves and purpose of the study)

Name of interviewer _____

Date of interview

Time of interview

Place of interview

Age : < 20 20-29 30-39 40-49 50-59 60-69 >70

Gender : Female () Male ()

Place of birth :

Education : Primary () Secondary () High () Bachelor ()

Occupation :

Size of house hold :

Head of the household:

1- What is your main source of income?

- () Agriculture
- () Sale of forest products
- () Non-farming activities like basketry, carvings etc.
- () Others, *(please specify...*

2- Is there any member of your family work outside the village?

- () Yes
- () No

If yes,

3- Why?

4- Which one of the ethnic groups do you belong?

- () Karen
- () Lua
- () Hmong (Meo)
- () Others, *(please specify...*

5- How is the forest useful to you?

- () Collect forest products
- () Controls erosion
- () Farming
- () Tourism
- () Others *(please specify...*

6- Which forest products do you collect? (If they do not use the forest, pass this question)

Products	How often do you use these products?	How often do you collect these products?	Rank (ask the respondent to rank them in order of importance for him) 1 being most important and 5 least important
Firewood			
Charcoal			
Shifting cultivation (<i>just say farming</i>)			
Fruits			
Medicinal Plants (which ones)			
Sacred Grooves			
Vegetables			
Raw Material			
Recreational Purposes			
Other (please specify)			

1- Extremely important 2- very important 3- important 4-not very important 5-Not important at all. (*define criteria as foot notes*)¹⁵

7- Is there a boundary between the forest and the village?

() Yes () No

a) If yes, what marks it? _____

b) If no, how do people differentiate the forest from the village land?

¹⁵ Extremely important-mainly for house consumption and the family highly depends on it, used on a daily basis
 2 very important- for sale (income generating, not mainly subsistence 3. Important-seasonal collection or used as “safety net” 4. least important- rarely used, may be collected once in a year Not important-Not used by the household, may be important to others.

Appendix 5: Interview guides

The following interview guides will be used for semi-structured interviews. Being aware of how daily observations will affect the questions to be asked, the interview guides are due to be modified while in the field.

Research question no. 1: What are the current forest regimes and how do the local people perceive them?

Forest management regimes →

Semi-structured interview with RFD staff member:

1. How is the forest managed?
2. Could you explain the purpose of the current management systems in this area?
3. How were these current management systems implemented? And why?
4. Is there any local involvement in managing the forests? If yes, in what ways? If no, why not?
5. Could you explain how forest management has changed over time in this region? (before and after the logging ban)
6. What is the role of RFD in forest in this area?
7. Are there rules regarding use or non-use of the forest? If yes, are the local communities aware?
8. Do you think the communities follow the rules?

Forest management regimes →

Semi-structured interview with NGO representative operating in the area:

Besides the questions asked to the RFD staff member the following will be added:

1. What are your main activities in the area?
2. In what ways do you involve local communities?
3. What are some of the issues you find relevant to highlight regarding forest management in Northern Thailand?

Perceptions of forest management regimes →

Semi-structured interviews with local community members:

1. Who manages the forest in this area?
2. How has the management changed over time?
3. In what ways do the management of the forest affect your daily life?
4. Are village members involved in the management of forest? Are you? If yes, in what ways?
5. What is your view regarding forest management in this area?

Research question no. 2: To what extend are the local people dependent on the forest resources?

Semi-structured interviews with local community members:

1. What is the importance of the forest to you?

2. What kind of products do you collect from the forest?
3. Is the collection of forest products divided between household-members? If yes, how and why?
4. What do you do with the collected products? (sale, own consumption, fodder?)
5. Do you only go into the forest to collect forest products or does it serve other purposes, such as recreational, cultural purposes?
6. From which sources do you get your monthly income?
7. In your own opinion, how would you rank these sources, according to their contribution to your monthly income?
8. Can you collect forest products from any part of the forest?
9. Is there any specific season in which you collect more or less forest products? If yes, when and why?
10. Are you giving any royalty to the RFD for collecting? If yes, how do you feel about this?

Research question no. 3: What are the effects of the location of Ob Luang NP boundary to the local people's use of the forest resources?

Semi-structured interviews with local community members:

1. Please tell us about the Ob Luang National Park
2. Do you know why the national park was established?
3. Do you agree with the area being a national park? If not, why?
4. How was the forest managed and conserved before the NP was declared?
5. Has the location of the boundary had an effect on where to collect forest products? If yes, in what ways? If not, why is this so?
6. Have you started collecting forest products in other areas due to the NP?
7. How was the laying out of the boundary of NP done?
8. How do you know where the boundary is?
9. Was anybody from this village involved in the decision making process of the laying out? If yes, who and why were they involved? If no, why do you think this was the case?
10. Has your access to the forest changed because of the declaration of the NP? If yes, in what ways?
11. Are you in contact with park authorities?
12. How often do you see them?
13. Have they told you what you are allowed to do and what not to do within the forest?
14. In your opinion, have they imposing more strictness after the implementation of the NP?
15. Do you find their demands reasonable?
16. Is there anything you would like to add?

Research question no. 4: How do the local people's activities inside the forest affect the forest resources in the National Park?

There is no interview guide for question four, because we shall rely on data collected from the other interviews and the data from forest sampling.

Appendix 6: Focus Group Discussion Guide

- **Background information** (everyone introduces him/herself).
- **What was the reason for establishing the national park?** (should clarify whether all the participants have the same opinion and knowledge about why the project has been implemented.)
- **What is good and what is bad in relation to the location of the boundary of the national park?** (Are there certain areas which have frustrated the villagers? Emphasis is placed on revealing needs, user participation, continued information. How are problems tackled – hereunder also opposition from the villagers?)
- **What are the consequences of the location of the boundary (on their livelihood strategies)?** (This question focuses on the groups mutual experience of the significant effects and consequences of the decision and implementation of the national park. Have social roles and daily work schedules been changed due to this? Is information and documentation left out or intensified?)
- **Do you feel watched carrying out your daily work in the forest?** (This question examines the villagers reliability and level of trust to the official agency (RFD), and also to the daily operating officials, e.g. rangers patrolling in the area and telling them where they can go and collect and where not to go).
- **Should anything be changed in relation to the boundary?** (This question focuses on both the physical and social aspects of the boundary).

Appendices for Final Report

Appendix 1 Activities that characterize PFM in BKP

Activities	Areas practiced			Decision-making		
	Farmland	Utilization forest	Conservation forest	FC	NCM	Others, specify
Demarcation	X	X	X	X	X	X
Firebreaks	X	X	X	X	X	X
Protection (patrolling)		X	X	X	X	X
Check dams	X	X	X	X	X	X
Reforestation	X	X	X	X	X	X
Agro-forestry	few			X	X	X

Rules and regulations	X	X	X	X	X	X
Watershed FM		X	X	X	X	X
Forest fire control	X	X	X	X	X	X
Vetiver grass plantation	X			X	X	X
Committee formation	X	X	X	X	X	X
Medicinal plants	X	X	X		X	X
Bamboo utilization	X		X	X	X	
Tourism						
Handicrafts	X	X	X	X	X	
Food collection	X	X	X	X		X
Sacred forest	X	X	X	X	X	X
Timber	X	X		X	X	X
Fuel wood collection	X	X	X			

Source: Focus Group discussion.

Appendix 2 Seasonal Activities Calendar

[illegible]

Appendix 3 Shadow price calculation

FUEL WOOD:

1 truck: 2 months

6 trucks: 12 months

1 truck: 2.000 kg: 2.000 Baht

6 trucks: 2.000 Baht: 12.000 Baht a year

FODDER:

Cow:

6 months (rainy season) in the forest. 6 months (dry and hot seasons) in the paddy field.

1 Rai paddy field = 100 Baht = 10 packages

5 package = 1 month

5 package x 12 month = 60 packages a year

1 package = 10 Baht

60 packages x 10 Baht = 600 Baht a year

600 Baht / 2 = 300 Baht a year for each cow

300 Baht x 1.5 (average cow number) = 450 Baht a year

Water Buffalo:

6 months (rainy season) in the forest. 6 months (dry and hot seasons) in the paddy field.

1 Rai paddy field = 100 Baht = 10 packages fodder

5 packages = 1 month

5 packages x 12 month = 60 packages a year

1 package = 10 Baht

60 packages x 10 Baht = 600 Baht a year

600 Baht / 2 = 300 Baht a year for each buffalo

300 Baht x 1.7 (average buffalo number) = 450 Baht a year???

Pig:

Pig is used to be a home sterd animal; fodder to feed it is collected from the forest (75 %) and paddy field (25 %).

1 Rai paddy field = 100 Baht = 10 packages of fodder

5 packages = 1 month

5 packages x 12 month = 60 packages a year

1 package = 10 Baht

60 packages x 10 Baht = 600 Baht a year

600 Baht / 3 = 200 x 2 = 400 Baht a year

400 Baht x 1.5 (average pig number) = 500 Baht a year

MEDICINAL PLANTS:

During the focus group discussion, five common diseases treated with medicinal plants obtained from the participants. Afterwards, the health center in the village was visited and an interview held with the doctor. The most common diseases and the treatment costs for each disease were obtained from the doctor.

Fewer : 11 Baht

Cough : 27 Baht

Back : 18 Baht

Knee : 15 Baht

Stomach : 44 Baht

Average price: 115 Baht

Average household number $5.5 \times 6 = 33$ times a year each household visit the doctor

$115 \text{ Baht} \times 33 \text{ times} = 3729 \text{ Baht a year}$

FOOD:

Monthly expenses: 500 Baht – 1.000 Baht. Average: 750 Baht

Daily expenses: $750 / 30 \text{ (day)} = 25 \text{ Baht}$

Daily expenses for vegetable: 5 – 10 Baht. Average: 7.5 Baht

Monthly expenses for food: $7.5 \times 30 = 225 \text{ Baht}$

30-40 % of food comes from the forest. Average: 35 %

$225 \times 100 / 35 = 78.5 \text{ Baht a month}$

$78.5 \times 12 \text{ (month)} = 942 \text{ Baht a year}$

TIMBER

1 truck = a house

1 truck = 55 trees

Labor cost (1 tree) = 5 Baht

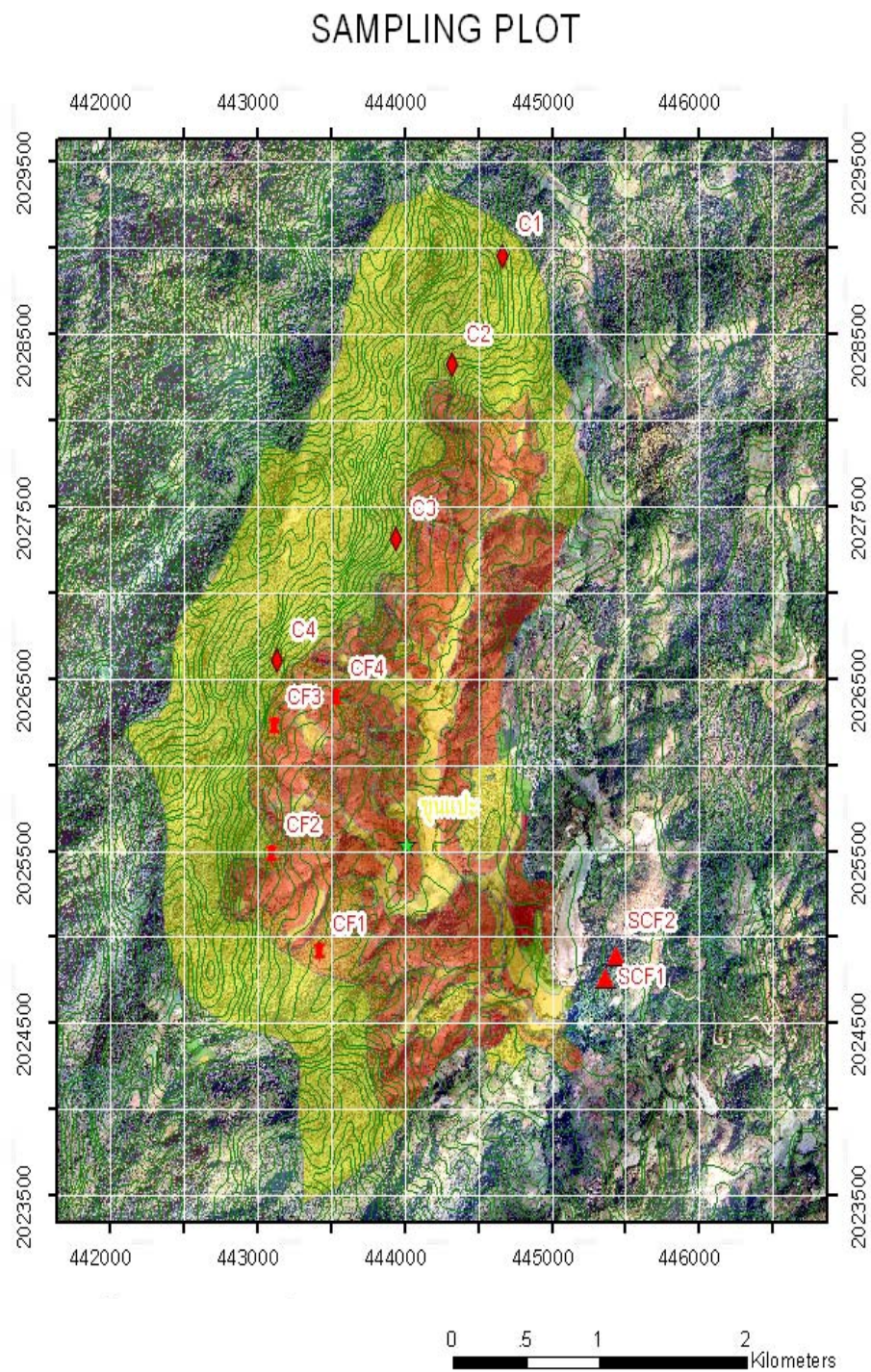
Labor cost (a house) = 275 Baht

Appendix 4 Scoring matrix for Livelihood capital assets

Scoring matrix for Livelihood capital assets (Used to weight capitals & draw pentagon.)					
Ranking	Unsustain-able	Constrained	Sustainable	Progressive	Abundant
Score	0	5	10	15	20
Capital assets					
Financial	Destitute - not enough money for basic essentials	Lack of credit and finance restricts livelihood to subsistence, despite other assets	Sufficient finance to purchase non-essential items given absence of other constraints	Enough finance to overcome restrictions in other capital assets	Rich - sufficient wealth to overcome any shortage in other capital assets
Physical	Isolated - insufficient infra-structure to access necessary resources for survival	Physical isolation and lack of communication restrict livelihoods to subsistence despite other assets	Sufficient infrastructure to improve conditions through trade given absence of other restrictions	Infrastructure sufficiently good to allow alternative livelihood options despite restrictions in some areas	Connected – access to products and services so easy that livelihood opportunities are abundant
Natural	Degraded – Resource failure due to irrevocable degradation of natural resources	Degradation of resource base restricts options to those of subsistence despite other assets	Enough natural resources to allow cash sale or trade given absence of other restrictions	Natural resource surpluses are sufficient to overcome restrictions in other areas	Verdant - natural resources so plentiful that adequate livelihoods are guaranteed
Human	Uneducated – education and skills so limited that opportunities to survive cannot be taken	Lack of education and training restricts options to those of subsistence despite other assets	Enough education and skills to develop non-subsistence opportunities given absence of other restrictions	Skills and education are sufficiently in demand that other livelihood restrictions can be overcome	Educated – skills and training offer more than one livelihood opportunity
Social	Oppressed - institutions persecute or fail to protect livelihoods	Social organisation so weak that it restricts livelihood options despite other assets	Social networks allow the development of organised support structures for non-subsistence activities given absence of other restrictions	Social structures sufficiently strong as to compensate for restrictions in other areas.	Supported – social structures offer varied opportunities for employment and income generation

Source: CIFOR research in Bulungan, East Kalimantan, Indonesia.

Appendix 5 Sampling plot



C- Conservation forest
CF- Community forest
SCF- Sacred forest

Appendix 6 Interview with national park chief

(Chief of Mae tea Mae Tia watershed)

Ob Luang national park covers 3 districts:

- Chomthong
- Hod
- XX

Different laws govern the different land use areas inside the national park. For instance, areas under cultivation are under the land and agriculture laws, while the forested areas are under the national park laws.

The major conflict that arose after the NP law was exercised was the lack of clear boundaries between the agricultural land and the forest land. Land demarcation is now a pilot project and has been going on in three villages: *Ban Khun Pae*, *Hin lek fai* and *Huay ma now*. Now with the boundary demarcation, farmers are not allowed to extend their farms further, and this drew a mixed reaction from our focused group discussions. Some farmers are worried that the farm is too small and their families are growing, while others remain content with the farm size they currently hold as the rest of the land is conserved as forests. It is however a common fear that the farmers do not have land title deeds (documents). (Since under the national park laws, settling or using the forest is forbidden within the national park area, then issuing of title deeds for the villagers would be contradicting the NP laws.

Current challenges in managing the National park

Land use conflict between the low land people and the upland people

Land ownership documents are not available to the farmers

“The law is still a problem, but the practical aspects seem to be working” Kamnoon.

The watershed committee.

This is the major link between the local communities, national park officials and other stakeholders in the practice of PFM. The committee is responsible for negotiating rules and regulations that are followed by the villagers with regard to use of the forests, for example: where the villagers can cut trees, collect firewood and NTFP's and also regarding land, such as the villagers cannot sell or transfer their land to outsiders. The negotiations are done with other stakeholders such as the national park office in forest matters and the land office in land matters. For those who trespass these laws, fines are also passed by the committee. The committee meets at least once per month.

Membership in to the watershed committee:

Every village must have a member representing it in the watershed committee. In most cases, the village headman, who is easy to reach and with some authority will be the automatic member. In Mae Pea watershed, the watershed committee is comprised of 15 members. Since there are 12 villages covered by the watershed, the 12 headmen are members in the watershed committee, the other 3 positions are filled by TAO heads in the villages.

Appendix 7 Interview with National park superintendent

Participatory Forest management in Northern Thailand: By law or by practice?

The *status quo* of the inhabitants of Upper Mae watershed, and in particular Ban Khun Pae village where our study was located is that of a shift from forest dependence to dependence on agriculture for both household and cash income. When asked on the steps that have seen people shift focus from forestry, the Ob Luang national park superintendent says that the **government policies** which were geared towards stopping the hill tribes from cultivating opium and replacing with cabbage, red onion and other cash crops played a major role. From an interview with Dr. Sinidhat, cabbage was a perfect replacement for opium as it does well in the same ecological zones as the opium.

“*Consumerism*” or **capitalism** where market factors act as a pull to the local people towards agriculture which is more attractive due to high returns on land and labor inputs as opposed to forestry. Some of the side effects of agriculture intensification have been land and water pollution due to use of chemical fertilizers and more the need for farmers to extend their cultivated land further in to the forest.

Difference between a national park and a forest reserve: Mainly on the extent of restrictions. The IUCN classifies national park in category 2, which is strict. Confirm with IUCN classification of 1978.

The national park was created with 3 main objectives:

- To conserve the biodiversity
- To preserve and conserve the forest for tourist attractions
- Use the forest for research and education purposes.

What is special about Ob Luang National park?

The national park was declared in an area that people had already settled. Instead of evacuating the local people by use of force, that national park superintendent has adopted the policy of co- management with the local communities so that even though by law a national park should have more strict regulations regarding entry and use, this is not the case.

Conflicts resulting from Establishment of Ob Luang National Park:

“*[Wamengmtia resolution]*”

About 8 years ago, the cabinet committee gave authority to the upland communities (commonly known as the hill tribes) to stay on the uplands. The lowlanders interpreted this as a guarantee to destroy the watershed upland and this led to insurgents, with the lowland people wanting the highland people to be forcefully evicted from the watersheds. [Some of the NGO's who have been involved in community forestry in the area include: Sustainable Development foundation (SDF), IMPEC (a tribal (Karen) NGO, TAMANA (foundation initiated by monks with ecology concepts)

Current challenges in Ob Luang:

Reconciling upstream and downstream communities on use of land and water in a sustainable way without conflicts. Upstream people need land for cultivating while the downstream

people need water, the challenge is to make them come together and find solutions to their own problems.

Ways forward: first, is by making them form committees (watershed committee); *second* is by providing them with solid and accurate data that can be used to influence decision making such as regarding land use changes by research institutions and universities.

Community forest bill:

“The local community has been managing the forests since time immemorial, if the practice of co-management is successful in absence of a supportive law, we can change the law later to suit the practices” *NP superintendent, translated information.*

My argument: If the co management law is not put down on paper, then the future of the local community is at the mercies of the person in command at that particular point in time in terms of PFM. It is important to give people rights to use the forest resource, but it is even more important to ensure such rights are clearly stipulated and guarded by law.

How the government intends to reconcile policy and practice in the management of parks

The JoMPA project, being a pilot project for the use of PFM in national parks, will tell a lot on what way the decisions regarding PFM will go. However, their goal is to use PFM and develop management strategies suitable for the area, and avoid the use of *guards and guns*.

The line of command

It is a characteristic of the Thailand society to be organized in hierarchy and therefore the forestry sector is not an exception.

The forestry sector is organized into 11 classes, with the highest in command being no. 11. The governor is no.10. Director general of national parks (also the chairman of the JOMPA steering committee) All the senior officers in the line of command are appointed by the government. The forest superintendent is ranked no. 5.