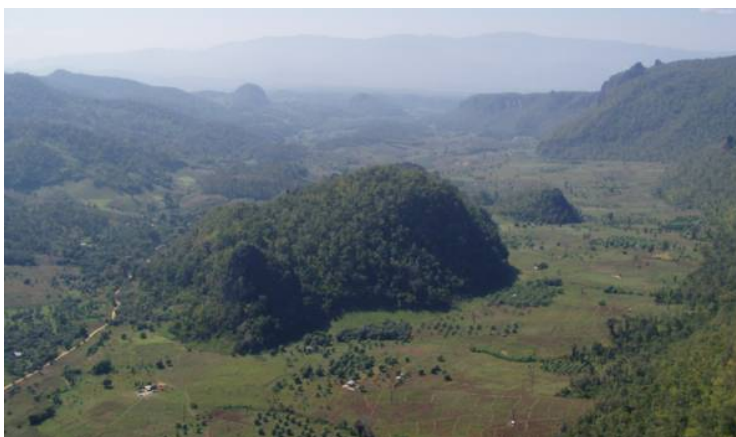


Abstract: The main objective of this research work is to identify the constraining factors that limit the villagers from securing their future livelihood in Ban Huai E-ko. During our 10 days of field work in the area, our research was based on the following methods: Village walks, questionnaires, focus group meetings, interviews, soil samplings and GPS. We found out that many factors are hindering them from developing but the land scarcity proved to be the overwhelming constraint. Population growth, government policies and legislation and topography were identified as the major cause of land scarcity in Ban Huai E-ko. Further research were made towards finding the various ways the villagers have resorted to in order to over come the problem of land scarcity. Further intensification, tourism and migration are the major factors in securing a future livelihood in Ban Huai E-ko. A further intensification of the agricultural system should be done by using methods which do not reduce the natural resources. The constraints to agricultural intensification are lack of citizenship and thereby the lack of tenure ship, lack of knowledge and lack of credit. Lack of credit is a constraint to agricultural intensification, because it is not possible to finance long-term investment in Ban Huai E-ko. It is not possible, because the BAAC and private banks are not represented in the village, and because loans obtained through funds have to be paid back within one year. We found out that migration as an alternative livelihood strategy has many constraints attached to it, for example the level of education, whereas tourism is more or less free of constraints.

The major differences between the Akha and Lisu hill tribes are that the Akhas have less land with SPK and less land per person. Therefore they are more affected by land scarcity.



Picture 1: Ban Huai E-ko with fields.

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We (Anders, Line, Susanne and Celestine) thank you all.

List of abbreviations

ALRO: Agricultural Land Reformation Office

A-zone: Agricultural zone

BAAC: Bank of Agriculture and Agricultural Co-operatives

Bt: Baht

CF: Community Forest

C-zone: Conservation zone

E-zone: Economic zone

GO: Governmental Organisation

GPS: Geographical Positioning System

NFR: National Forest Reserve

NGO: Non-Governmental Organisation

NP: National Park

NPK: Nitrogen, Phosphorous and Potassium

NTFP: Non-Timber Forest Products

OM: Organic Matter

RFD: Royal Forest Department

SPK: Sor Por Kor land certificate

STK: Sor Tor Kor land certificate

TAO: Tambon Administration Office

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1. Introduction

Thailand has since the Second World War followed the classic model for economic development¹ by extracting an economic surplus from agriculture through trade and taxation to create the basis for industrial development. In this way Thailand became a leading economy of agricultural commodities, especially rice. People moved from the plains of central Thailand into the forested areas of the North and Northeast which they cleared for agricultural purposes (Brenner et al., 1999, Buch-Hansen, 2001).

For this and other reasons vast areas of forest has been cleared. Originally Thailand's forests extended over an area of 535.000 km², approximately 60% of the country. In 1995, the official estimation of forest cover was 25% of the country, but it is expected that only 18% of this area had a healthy forest cover (Kinch et al., 2001).

For several centuries the forested areas of North Thailand has been inhabited by hill tribes from Burma and Laos. Migration is still taking place though in smaller scale. When first arriving to Thailand the hill tribe people settled in the forest and cleared part of it for agriculture. The descendents of these people are still living off this land or they have moved to new areas. They are mostly small scale farmers, practicing shifting cultivation, but changes in their surrounding environment have introduced new livelihood strategies. Until recently they lived in the mountains isolated from the rest of Thailand. But the expansion of Thai farmers into the remote rural areas has created population pressure which has forced the hill tribes to move further up into the highlands, clearing new forest. Today hill tribe people have become an integrated part of the Thai economy (Brenner et al., 1999; Isager, 2002).

Since the 1980s focus has been on conservation and resource management of forest. In order to stop the deforestation and to conserve the forest, the government introduced several forest policies and more law enforcement. It restricts people from clearing and using the forest and has resulted in insecure tenure with people often lacking use rights to the land they cultivate. The conservation policies has therefore entailed that the hill tribes

¹ Lewis two-sector model.

have to sustain their livelihood using less land and formally no forest. This has changed the way they use the natural resources to survive (Brenner et al., 1999; Hirsh, 1997).

Land has become scarce due to several reasons, among them increasing population density, government policies and insecure tenure. But also biophysical factors are directly or indirectly related to land scarcity such as the topography.

The hill tribes therefore have to adapt and conform to the environment they live in; that is both the natural environment as well as the social-economic environment that surrounds and affects them. Thus the livelihood strategy of the hill tribes can partly be seen as a result of the constraints they face.

Research

Our research has taken place in Mae Tor Watershed in North Thailand in the village of Ban Huai E-ko. It is inhabited by two different hill tribes sharing the same natural resources. At first sight it is apparent that the village is confined by the nature of topography, as they are surrounded by mountains and high cliff. This creates a situation of land scarcity. But other constraints can also cause or be caused by land scarcity and are related both to the natural and socio-economic environment. These are less obvious and must be investigated so as to fully realise the constraints the villagers live under.

Thus we find it meaningful to look into the issues that constraint the villagers from improving their future livelihood.

Our research question is therefore the following:

1.1 Research question

What constraints the villagers of Ban Huai E-ko from securing their future livelihood under conditions of land scarcity?

The original research question has been modified for certain reasons. It said:

How can the villagers of Ban Huai E-ko secure a future livelihood under conditions of land scarcity?

Firstly this question required looking into solutions, which is not the objective of this

research. The new research question therefore focuses on identifying the *constraints* in securing their future livelihood.

1.2 Limitation

We will not look into to organisations within the village.

1.3 Data needed

In the this chapter we will explain what data we wanted to collect and which issues we wanted to look into, during the fieldwork, in order to answer the research question. When working with the term livelihood very many issues must be considered, issues related to social, economic and natural science. The term 'livelihood' can be used in many ways, but the following definition covers the broad notion of livelihoods understood here: "A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base" (Chambers and Conway, 1992).

Livelihoods are more complex in developing countries than in the industrialized countries, where one main income comes from employment with fixed working hours and a known level of salary. Livelihoods are influenced by a wide range of external forces, both within and outside their locality, that are beyond the control of the household (Cain and McNicoll, 1988).

1.3.1 Access to land

Any factor limiting the access to land can be considered as a constraint of securing a future livelihood in Ban Huai E-ko. Access to land in Thailand is influenced by many factors, which determine if land scarcity exists. On a large scale the governmental departments plays a major role, because they administer the Thai citizenship, which is the first step on the way to get legal right to the land. The governmental departments are also responsible of land classification and tenure status (Royal Forest Department (RFD) etc).

The hill tribes of Ban Huai E-ko do not have the same historical background. It is therefore important to get to know whether the village history and the ethnicity have an impact on the

distribution of land. The level of education is important, in order to get an idea of their job opportunities. Since the natural resources are the fundament on which a society can build, it is important to look into the water consumption and supply, as well as the forest use.

1.3.2 Land use practices

The land use practices are important, when investigating the security of a future livelihood in Ban Huai E-ko, since agriculture is the main source of income. Due to land scarcity, agricultural intensification seems to be one of the ways to secure their livelihood.

The topography of the farmland determines whether the farmland is easy accessible, and it can cause erosion and thereby agricultural degradation.

It is important to understand the cropping system, in order to estimate if the agricultural practice is optimal in the long run. If the agricultural practice is not efficient, the land under cultivation could decline in fertility, and the agricultural output would be insufficient to sustain the households. The soil sampling is used to estimate the fertility of the land under cultivation as a whole, as well as the fertility of each field plot, from where the samples were taken.

The inputs used in the agriculture shows how the farmers invest in their production, and it shows the potentials for the future.

1.3.3 Livelihood strategies and economic conditions

It is important to investigate which livelihood strategies the villagers can turn to, besides agriculture, if access to land is limited. If agriculture is the only livelihood strategy, and no more land is available, the villagers of Ban Huai E-ko will have to depend more on off-farm income, such as seasonal migration and tourism.

Access to credit is necessary to make long term investments in order to intensify the agriculture. The land market reveals if there are any legal possibilities of expanding the agricultural area, and if there is a demand for more land.

1.4 Working teams

During the fieldwork we organised ourselves in working teams, in order to get the data needed. This way we wanted to make sure that all relevant issues were covered.

Working team A was responsible of the topic Access to land

Working team B was responsible of the topic Land use practices

Working team C was responsible of the topic Livelihood strategy and economic conditions.

2. Methods

In the following chapter our methods used during our fieldwork is described with an explanation of the purpose of each method and what we got out of using them.

Our methodological approach was based on the work done by the Danish students before leaving for Thailand. At that time the objective of each working team was expressed in research questions. For the questions under each objective we defined the data needed and the sources these data should be obtained from. On the basis of this we selected the appropriate methods to be used.

In Thailand, though, we did not succeed in using all the methods intended. Consequently we did not do participatory village mapping, for instance, for the simple reason that the villagers already had a map of the village (see appendix A). It also happened that one of the Thai students would do a method alone and for that reason we did not try using the GPS or made a transect walk. Some of this is due to the fact that we did not have a consensus on what each working team were to do in detail. We could have helped the situation if we had made a research table like the above mentioned with objective, questions, data needed and methods to use.

2.1 Secondary data

Before going to on the field trip we reviewed literature so as to gain general knowledge about the situation in Thailand. The Thai students presented geographical facts about Mae Tor Watershed, data on the village e.g. information about the two ethnic groups in the village. The literature and the data will be discussed later in relation to our primary data; our findings from the village.

2.2 Village walks

Two village walks were conducted in order to get a general overview of the village. The first took place in the Lisu part of the village together with one of the two village headman

assistants, which was Lisu. A second walk took place in the Akha part guided by the Akha spokesman.

The walks gave us a general impression of the living conditions, the differences between the tribes, such as different houses, clothing, and living standard.

2.3 Questionnaire

By merging the interview guide prepared by the Danish students and an interview guide the Thai students had from a book, we produced the questionnaire (see appendix B). It was tested with both Akha and Lisu households. After testing the questionnaire, it was shortened and edited to take approximately one hour to conduct. In the first round of interviews we gathered general information, which made us capable of assessing who to interview in-depth.



Picture 2: Interview with Mr. Wichit.

Selecting the respondents

Due to time restraints only 30 of the 93 households in the village were interviewed, using random stratified sampling. We chose to separate the 30 respondents into two strata: Akha and Lisu. The stratified sampling was based on the observations of some distinct differences in e.g. religion, house construction and code of dressing and on the fact that the village was clearly divided into two ethnic parts. In this way we could prevent any possible biases between the two ethnic groups, and investigate if there were any differences in the livelihood between the two groups; we assumed that if differences existed it might lead to different constraints in their lives.

The village headman assistant had provided us with two locally made maps each showing

the village and the fields (see appendix A). Since there were approximately just as many Akha as Lisu households in the village, we selected 15 Akha and 15 Lisu households by counting every third household in each part of the village and mark this on the map. This ensured us an even geographical representation of the households in the village.

Based on the data we have gathered we realise that other strata might have been more relevant than the ones chosen. These are size of agricultural land, citizenship and involvement in tourism, because these issues have a greater impact on the livelihood of the villagers. But for the above mentioned reasons, and due to time pressure and lack of prior knowledge about the village, other kinds of strata were not made. Additional variance between other ways of grouping the villagers would be covered, because our sample size is representative.

We have recognised that the stratification is best made on the basis of a pilot study with specific questions, as it will provide us with the data necessary to make the stratification.

Conducting the interviews

When conducting the interviews we aimed at representing each working team in each interview group, as well as both a Danish and Thai student. We sometimes did not succeed in that, because of time pressure. Then two Thais or two Danish students went alone. Approximately 1/3 of the questionnaires were conducted with only Thai students present. It was an advantage to be one Danish student and one Thai present during the interviews, since no information would be lost during the later translation.

It was an advantage for us if we conducted the interview, as we were able to direct the interview process. Sometimes it was difficult to interfere, when the Thais conducted the interviews.

We ended up not covering exactly every third households because some people were not at home. In this situation the neighbouring house was selected. This could in most cases have been avoided if we had started the interview earlier in the morning or made an appointment the day before. Inconsistency in the maps also created problems, e.g. when houses were missing or situated differently on the map.

Analysis of questionnaires

After conducting the questionnaires we started analysing the results. This was done by plotting all the answers into tables according to issues, e.g. household characteristics, farming system, use of forest, migration and loans/investments. This enabled us to get an overview of the information from each household, and to compare it.

Due to the fact that people had different ways of plotting the answers from the questionnaires into the tables and making the analysis some inconsistency occurred. This may have led to incorrect results and has complicated further analysis.

2.4 Focus group meetings

The tables were used to identify 5 Akha and 5 Lisu key informants to participate in a focus group meeting - one for Akha and one for Lisu. We wanted to interview again to gain more specific information, through discussions.

Each working team had prepared questions on a number of issues that needed to be covered during the focus group meetings and the in-depth interviews. But it was difficult to estimate what more data was needed. If time had permitted us to write down and analyse our findings in the field more useful in-depth data could have been gathered.

During the Akha focus group meeting, a problem suddenly occurred. Some people interrupted the meeting to announce that a village meeting was taking place at the same time. Among the Akhas there was a serious drug problem, which was discussed at this meeting. The villagers were also explained what was the purpose of our stay. Some of the students left for this meeting, while the rest of us continued the focus group meeting. This created a short break but did not have an effect on the result of the meeting.

We wanted the participants to discuss our questions with each other but it never really happened. The reason was that our questions did not encourage to discussion as many of the questions were too precise and demanded a straight answer.

The focus group meeting with the Lisus was carried out without interruption. Here the students managed to create a fluent discussion. One participant showed up a bit later than the others, and after his arrival the other participants did not participate that much.

2.5 In-depth interviews

After the focus group meetings had been carried out, further interviews were made in order to get more information on specific topics.

Since the Lisu focus group meeting was very informative, no in-depths interviews were carried out among the Lisus. Our planning of the in-depth interviews of the Akhas was very poor. We therefore experienced many times that they did not have time to talk with us. We should have made appointments with them beforehand.

2.6 Transect walk

A transect walk was done, in order to get an understanding of the physical features of the village, and a drawing was made. It identifies and analyses the distinct production characteristics of a community, and determines some of its problems and potentials. It includes characteristics such as topography, location of homes, wooden areas, crops, rivers etc. (Selener, Endara and Carvajal, 1999). The Danish students were not aware that a transect walk had been conducted until the end of the field work. Since much of the benefit from doing a transect walk is the work itself our benefit from this was limited.

2.7 Soil sampling

Soil samples were taken from the fields of the participants in the focus group meetings. Our set criteria were to measure the values of the following elements: Nitrogen, phosphorous, potassium (N, P, K), as well as pH, and the organic matter content, in order to investigate the fertility of the area.

The farmlands have varied characteristics, and we tried to take the samples in such a way that the different features of each particular land would be represented. We analysed e.g. farmlands with and without leguminous crops to find out if the legumes had influenced the nutritional content, and on a hilly piece of land we took samples from up slope, mid slope and down slope.

Due to time pressure we did not do this in a systematic way, and this could cause an uneven representation. The samples were taken from the first 20 cm topsoil. After the samples had dried in the shade, the tests were carried out using the NPK soil test kit. Later on the soil were sent to the laboratory of Maejo University, where the samples were tested for organic matter content.

We did not composite the samples, because we wanted to look for specific cause and effect

factors on each piece of land, while at the same time trying to estimate the fertility of farm land in Ban Huai E-ko as a whole.

Unfortunately some soil samples were lost, as well as the descriptions of the plots where these samples were taken. The outcome of the soil samples is thereby heavily reduced, because we can only test for the influence of each varying feature on a small scale.

The manual of the NPK soil test kit is only in Thai language; therefore we do not know which chemicals we used, during the tests.

2.8 Soil profile observation

A soil profile was taken on the land of Mr. Arche Arsong, using the auger. The profile was taken from the depth of 60 cm, and it illustrates the different layers in the upper horizons. This soil profile confirms the results from the soil tests, and in this way the method was useful.

2.9 Mapping of agricultural area using GPS

A GPS survey was carried out; the land with and without Sor Por Kor (SPK) was marked. Local guides showed us the boundaries of the fields and forest, while the positions were plotted into the GPS. This way we could make a map showing the situation of the fields, and whether the physical boundaries coincided with forest classifications of National Park (NP) boundary and National Forest Reserve (NFR). These data are used in the analysis and the discussion.

2.10 Key informants

Interviews with regional RFD and Tambon Administration Organization (TAO) were carried out to get more information about how the authorities affect the villager's life. These meetings were organised by the base camp. A volunteer in IMPECT lived in the village, which was interviewed at several occasions.

2.11 Community meeting

The last evening a community meeting was carried out. Our objectives for doing this were to give the villagers an idea of what we had learned about the village, and to say a proper goodbye to them. We were not successful in starting a discussion; neither did we have the

feeling that the villagers learned something new.

Despite of that the village meeting was a fantastic success.

To start the session one of the Danish students did magic tricks in front of the 70-80 participants, which made everybody laugh. After our presentation the volunteer in IMPECT explained how the organisation fights for the basic human rights of the hill tribe people. In the end of the meeting the Akha women, who had all turned up in their traditional clothes, danced their traditional dance, and invited us to participate. The Danish students did the boogie-woogie (a dance of the western culture) and the meeting ended with the Lisu presenting their traditional dances. Even though we did not do scientific exchange, we did cultural exchange, and everybody had a good time.

To our regret we did not make a village meeting in the beginning of our stay. We did plan to do this, but due to disagreement between the students about the expected outcome of a meeting, it was never carried out. A village meeting would most likely have avoided several problems during our stay, with respect to the Akha focus group meeting and lack of willingness from the villagers to give information especially in the beginning of the interviews.

3. Findings

In this chapter we present the findings from the field trip. They are derived from the raw data we have gathered using the methods mentioned. The findings are presented according to the issues each working teams was responsible for.

We have observed some differences between the two tribes. Only where such differences are significant the tribes are presented separately.

3.1 Working team A - Access to land

3.1.1 Village history and tribes

Ban Huai E-ko was established in 1937, by the Karen hill tribe. In 1957 the Lisu hill tribe settled there, and the Karen, who preferred to move further up the watershed, established the village of Ban Pha Lai. In 1967 the Akha hill tribe came to Ban Huai E-ko and settled next to the Lisu. Therefore the town is divided in an Akha part and a Lisu part (see Appendix A).

The migration to the village is continuous and thus some has settled here 6 years ago. Some came 30 years ago.

Today the whole village is inhabited by 45 Lisu households and 48 Akha households; approximately 600 people. The total number of people in the 30 interviewed households is 110 Akha and 76 Lisu.



Picture 3: Akha woman.

Ban Huai E-ko and Ban Pha Lai are in Mo 16 and is therefore officially considered the same village. The two villages have one headman from Ban Pha Lai and two assistant headmen which are both Lisu. We do not know why there is no Akha headman, but people stated, when asked, that the communities had agreed upon this. The Akha has a spokesman whose function is to inform the Akha people. The communication with the authorities goes via this group of leaders.

The Lisu are Christian with only one person being Buddhist. At Akha 8 households are Buddhist, 6 Christian. Only one is animist.

3.1.2 Education

The children have the possibility of going to school. There is a primary school in Ban Pha Lai and in Chiang Dao. Some of the children go to boarding school.

It is with few exceptions the older generations that has no education. Most people today speak Thai which they learn since primary school. Only the older generation (grandfather/grandmother) or those from the younger generations who haven't been to school don't speak Thai.

%	Not educated	Educated	Primary	High school	Higher than high school
Lisu	56.1	43.9	33.3	10.6	2
Akha	58.1	41.9	20.4	15.1	2
Sum	57.2	42.8	25.8	13.2	4

Table 1: Education of the villagers older than 8 years

The main difference between the two tribes is that three out of four Akha continued their education to high school, whereas only one out of three of the Lisu did the same. Only 2 Lisu and 2 Akha continued studying or study after high school.

3.1.3 Infrastructure

The village is situated along a dirt road, but it is generally in a good condition. The road comes to an end in Ban Pha Lai, the last town in the watershed. An asphalt road stops just 200 meters before the village.

The Lisu part is situated in the valley and the Akha in the valley and on the hill side. Access with a car to the houses situated on the edge of the village is not possible. According to the results from the questionnaire the three households with the smallest land holdings are situated in this area.

There are few roads (dirt tracks) leading to the fields. For most farmers their fields are not near these roads and transport from the fields is difficult.

3.1.4 Water supply and water consumption

Water for household consumption in Ban Huai E-ko is collected from Huai Ton Yang in the Ban Pha Lai area some kilometres away. From reservoirs water is distributed to every household via pipes.

There is a lack of water in the end of the dry season from April to May as the stream runs dry. During water shortage TAO and the Military Unit supply them with water.

3.1.5 Land classification and tenure

40% of the forests in Thailand are classified as national forests reserve (NFR) (for details see appendix C). The NFR is divided into 3 zones: Agricultural zone, Economic zone and Conservation zone (A, E and C-zone) but as it has not yet been implemented, the term NFR is used. The C-zone is strictly for conservation and is classified either as National Park, Wildlife Sanctuary or watershed areas and the E-zone is planned for commercial plantations or reserved for landless farmers (Mingtipol, 2003).

In Thailand all land classified as forest is owned by the state. Consequently it is only possible to apply for usufruct right to the land one cultivates, depending on the classification of the area.

3.1.6 Land classification and tenure status in Ban Huai E-ko

In Ban Huai E-ko the village is classified NFR with the Sri Lana National Park surrounding it (see Appendix A). The boundaries of the park follow the topography (high cliffs) and are therefore a natural limitation to the expansion of agricultural land. The NFR in the area will be classified E-zone after implementation of the zones. For the fields situated in the E-zone it was possible to apply for SPK from the Agricultural Land Reform Office (ALRO) in 1975. It gives usufruct right but cannot be sold or transferred (Mingtipol, 2003). The GPS survey of the two types of land (with and without SPK) shows that forest encroachment is taking place.

The map, which is made by the community (Ban Huai E-ko and Ban Pha Lai) shows the situation of the fields and forests in the area (see appendix A). The yellow part symbolizes the fields without SPK and is situated in the national park. The grey part is fields with SPK, situated in the NFR. The fields are separated into Lisu and Akha parts. The Lisu has fields north and east of the village and a part south of the village. The Akha mainly has fields west of the village and a part south of the village.

There is a big difference between the Akha and the Lisu when it comes to land certificates (see table 2). Almost twice as many plots of the Akha as the Lisu do not have any certificate. 60% of the Akha households have no certificate, whereas the number for the Lisu households is only 26.6%. Of all the Akha households none of them has SPK on all plots, while 40% of the Lisu households have SPK on all their plots. The tenure for the Akha is therefore more insecure than for the Lisu.

	Total number of plots	Plots which has:*		Households where have certificate on:*		
		No certificate	SPK/STK	No plots	1 plot**	All plots
Akha	36 plots	83.3%	16.7%	60%	40%	0%
Lisu	27 plots	48.1%	51.9%	26.6%	33.3%	40%
Total	63 plots	68.3%	31.7%	43.3%	73.3%	20%

Table 2: The table show how many percent of the total amount of plots has certificate or not. It also shows how many % of all the households have no plots, 1 plot or all plots have certificate. *Including rented land, **Households owing only one plot and having SPK are not counted in.

3.1.7 Forest use

The villagers of Ban Huai E-ko have a Community Forest in the NP which is administrated by the National Park Office. It is situated around the village (see Appendix A).

The Community Forest Bill which allows community forestry under certain conditions has not yet been accepted. Therefore the NP Office see the CF in the village as a pilot project that teaches the villagers and makes them able to manage the CF if the Bill is accepted.

Therefore the CF is officially illegal, but still acknowledged. When or if the Bill is accepted the CF will become legal according to the National Park Officer, if they continue to fulfil the conditions set by the authorities.

People use the forest mostly to collect fire wood, cut trees and bamboo for house building and repair (picture of man with bamboo) and to collect NTFP for consumption like bamboo shoots, roots, mushrooms and fruits, while few are hunting (see appendix D for details).

3.1.8 Citizenship and ID card

3 types of ID card exist. Two are so called hill tribe cards: Blue card and Green card with red rim. Before these cards were introduced no kind of ID card for hill tribes existed. The cards were made in order to register and keep track of the hill tribe people.

The Thai ID card is important, because with that they are allowed to migrate out of the

District without asking permission and without citizenship one cannot apply for SPK. And people with a hill tribe card have problems getting a job. With the Thai ID it is easier to get a job since it doesn't show your ethnic identity.

For a hill tribe person who wants to ask for Thai citizenship, they have to show one of the following documents and hill tribe cards:

1. Population survey (1985 - 1987)
2. A register of highland community history (1990 - 1991) with Blue card
3. A register of highland community history following by Master Plan: Green with red rim card (Miyasaya card)

Each person can ask for Thai citizenship at the District Office by using one of the three documents, which will confirm his relation to the village. If he does not have the first one he can show the second and so forth.

	Number of people who have		Number of households where		
	no Thai ID	Thai ID	no one have Thai ID	at least one have Thai ID	all have Thai ID
Akha	22,0%	78,0%	13,3%	86,7%	46,7%
Lisu	26,8%	73,2%	13,3%	86,7%	53,3%
Total	23,9%	76,1%	13,3%	86,7%	50,0%

Table 3: Number of people/household holding a Thai ID card.

In Ban Huai E-ko problems with citizenship only concerns 23.9% of the villagers and only 13.3% of the households do not have any members holding a Thai ID. The last number is important because it is reasonable to assume that one member is enough to apply for SPK or a loan in Bank of Agriculture and Agricultural Cooperation (BAAC).

3.2 Working Team B - Land use practices

3.2.1 Agriculture

Topography

The topography of the farmland is in general hilly, but some places they cultivate on steep

slopes, which makes it difficult to cultivate. Erosion is likely to occur, and we observed the physical consequences of erosion different places in the village, as well as on the farmland.

Agricultural land

All of the farmers stated that the agricultural system is rain fed.

During the Akha focus group it was discussed what the optimal size of households' landholdings is, in order to sustain a family. Depending on the size of the household it ranges from 25 to 30 rai.

	Akha	Lisu
Average number of plots per household	2.4	1.7
Average size of plots	7.4 rai	10.1 rai
Average size of landholding per household	17,5 rai	17.5 rai
Average size of landholding per person	2.35 rai	3.46 rai

Table 4: Landholdings (6.25 rai = 1 ha, 1 rai = 40 m x 40 m).

One farmer among the Akhas rents land for agricultural purposes. These farmers pay 2/3 of the yield as a rent to the landowner. 3 households among the Lisus are renting land in the lowland in order to cultivate paddy rice. Only 7% have bought land in order to cultivate it. Through focus meetings people expressed that they would not sell any land, because this would make it difficult for their children who inherit their land.

Cash crops

63.3% of the interviewed households cultivate maize as a cash crop. Many houses in the village were decorated with advertisements for maize hybrid seeds. The farmers use hybrid seeds in maize production, so they have to buy seeds for every season, else the output will decline. The hybrid seeds used are especially the varieties of 888 and 919 from CP Company and Monsanto, respectively. It is also possible to buy low price hybrid seeds from the neighbouring district.

In most cases maize is cultivated as sub-sequential crop, whereby you can grow other crops, like peanuts or beans, on the same land the same year. Some farmers grow a second round of maize within the same year. The price of the second maize crop will be higher

than the price of the first maize crop, since the supply is low.

56.6% of the households are growing peanuts as a cash crop, and use their own peanut seeds.

26.7% of the households interviewed are growing black bean as cash crops, and 30% cultivates mango also as a cash crop. On much of the cultivated land mango trees are planted on the same plot with other crops, e.g. maize or upland rice. According to Mr. Arkang Mubogo this is done in order to get more cash crops out of the same piece of land.

Agricultural output for consumption

Vegetables are mainly produced for consumption, and not on a large scale. Some are grown around the house, others on the field plots.

26.7% of the villagers cultivate rice, and it is for consumption. The rice planted is upland rice, except from the mentioned paddy rice cultivation in the lowlands. Most of the villagers therefore have to buy their rice. Upland rice is usually intercropped with sunflower and cucumber. When growing upland rice, it is only possible to grow one crop per year, and this is the reason why farmers prefer to grow maize.

Appendix E contains a seasonal cropping calendar.

The livestock farming consists of chicken, pigs and a few ducks. The villagers keep catfish in cement ponds. Other kinds of fish are kept in a natural lake.

3.2.2 Input

Machinery is used for ploughing only, in order to prepare the soil before sowing. 83.3% of the households use tractors. Small tractors are owned by some of the villagers, whereas the heavy ones are rented, the price is 200 Bt/rai if the land has SPK. If the land has no SPK, the price is 400-500 Bt/rai, since it is illegal to cultivate this land. Labour exchange and hired labour are used in agriculture production. Hired labour costs 80 baht per day.

93.3% of the villagers use herbicides. After sowing, when the maize seedlings reach the height of a hand length, the villagers will apply selective herbicides, which only kill the weed. On the Lisu focus group meeting the villagers said that they overdose the herbicide. Protection is available, but not all the farmers used it. Mr. Arkang Mubogo told us that he had symptoms of herbicide poisoning.

In the earlier days, when they did not use herbicide, but removed the weed by hand, the

yield was actually better. But as the wife of Mr. Arkang Mubogo said, it is easier to use the herbicide.



Picture 4: Maize with bug.

Chemical fertilisers are not used. Manure from animals is not used either, because this practice does not belong to the cultural context, and the farmers do not know the benefits of fertilisation with manure. We observed that the pigs are placed in small houses on poles, and that their manure just falls to the ground under the house. The amount of manure from the pigs is not sufficient, even if the villagers wanted to use it for fertilisation. The only way, the villagers contribute to the fertility of the soil is by using leguminous crops, as in sub-sequential cropping together with the maize. The main leguminous crops are peanut, red bean, black bean and soybean.

The crop output fluctuates from year to year, and no trend can be observed. The present farming system of Ban Huai E-ko can be described as a low input farming system, because machinery, pesticides, fertilisers and investments in agriculture are used in small measure.

3.2.3 Agricultural market

There exist several companies that buy maize. The villagers can choose the company themselves and thereby ensure that they get a competitive price for their output.

The company will bring the threshing machine and still pay the market price. This therefore seems like the best for the villagers.

Contract farming exists for peanut production. A local villager represents the company and sells the peanut seeds to the other villagers. A deficit can be paid through next year yield.

This creates a state of dependency to the peanut seller and it can be difficult for the farmer

to estimate the interest rate paid.

In 2001 the price for peanut was high. This encouraged the farmers to produce peanuts in 2002. In the meantime the price for peanuts has dropped.

3.2.4 Yield

Maize yield ranges from 303-1250 kg/rai. Peanut yield ranges between 5-50 tang²/rai. The income from mango varies from 300-3,000 Bt/year. It has been shown that the total income from agriculture range from 6,000-55,500 Bt/household/year. The income per rai is therefore minimum 1,011 Bt/rai/year, maximum 6,875 Bt/rai/year, and on average 2,987 Bt/rai/year.

Farmer	Tribe	Cultivated land (rai)	Maize output kg/rai	Peanut Output tang/rai	Mango income Bt/year	Real income Bt/year	Average income Bt/rai/year
Mr. Malaka	Lisu	4	1.250	50.	-	27,500	6,875
Mr. Uniya	Lisu	42	628	9.5	-	43,000	2,866
Mr. Somsak	Lisu	15	303	18.7	3000	42,500	1,011
Mr. Sripan	Lisu	3	-	40	-	6,000	2,000
Mr. Alaeya	Akha	1.5	666	5	300	12,800	1,347
Mr. Wichit	Akha	18	388	14	-	28,000	1,555
Mr. Arkang	Akha	10	800	50	2500	55,500	5,550
Mr. Artoo	Akha	15	533	13.5	-	38,000	2,533
Mr. Aryae	Akha	10	514	25	-	31,475	3,147

Table 5: Average agricultural output and income from those farmers who informed us about their yield.

These calculations are based on the information from the questionnaires. It was not all the interviewed persons who wanted to share information concerning yield or income with us. Therefore it is only 9 out of the 30 interviewed households that are represented in the next table, which is showing the income of the household deriving from the agricultural output.

² 1 tang = 20 litre

3.2.5 Soil sampling

In this chapter the soil samples will be presented and analysed. The results are analysed by relating them to each farmer. The parameters used when testing the soil samples are described in appendix F.

The table is showing the results from the soil samples taken, from 9 out of the 10 participants in our focus group meetings.

	OM%	Ammonium	Nitrate	Phosphorus	Potassium	pH
Mr. Arche Archong	7.68	Low	Very low	Very low	High	6.5
Mr. Arche Archong	2.97	Very low	Very low	Low	High	7
Mr. Artoo	3.79	Low	Very low	Very high	Low	7
Mr. Artoo – dry soil	2.40	Low	Low	Very high	Low	7.5
Mr. Arkang – maize field	5.05	Low	Very low	Very high	Low	7.5
Mr. Uniya	6.08	Very low	Very low	High	Low	7
Mr. Alepa – maize field	3.47	Very low	Very low	Very low	Low	7
Mr. Alepa – upland rice	2.67	Very low	Very low	Very low	Low	6.5
Mr. Malaka	4.39	Very low	Very low	Medium	Low	7
Mr. Somsak – flat land	2.21	Very low	Very low	High	Low	7
Mr. Somsak – upland field	6.61	Very low	Very low	Very low	Low	7
Mrs. Sripan	5.95		Very low	High	Low	6.5
Mr. Aryae	5.83	Very low	Very low	Low	Low	5.5

Table 6: Soil samples from the farmlands of 9 farmers in Ban Huai E-ko. Unfortunately many of the descriptions of each farmland were lost.

3.2.6 Analysis of the soil samples

Organic matter

The content of organic matter is to be considered as a pool of nutrients, which are not yet released. The decomposition of the organic matter, and thereby the release of soil nutrients are depending on various factors, such as the micro-organism present, temperature, rain fall etc. We consider the content of organic matter as an indicator of soil fertility, assuming the release of nutrients actually takes place more or less continuously. The organic matter content (OM in %) is very high, and this is also supported by the only soil profile that we did. This profile was very black in the topsoil, and red in the deeper horizons. The black colour most likely derives from the organic matter.

The soil samples show a high amount of organic matter, but this content is also varying a lot from sample to sample. This could be due to changes in topography, as well as differences in the treatment of the plant residues after harvesting. Most of the farmers stated that they either burn the plant residues right on the farmland, or pile it together and burn it elsewhere.

Nitrate

The amount of nitrogen, ammonium and nitrate, is low or very low, in all the 9 samples. This could be due to the fact that the samples were taken during the dry season, and after harvest, whereby the crops may have taken up most of the available nitrogen.

Phosphorous

It would be likely to assume that when the organic matter content is high, the level of phosphorous would also be high. It is actually only the case with Mr. Arkang, Mr. Uniya and Mr. Sripan. Otherwise there is no correlation between amount of organic matter and the level of P. The level of P is fluctuating a lot from sample to sample.

Potassium

Unfortunately we do not know if we measured the total K (available, unavailable and slowly available). If we did, it only gives an indication of the reserves and not of what is actually available for the crops. Since the slowly available K originates from the organic matter, it would be likely to assume that there is a correlation between the organic matter content and the level of potassium. This is only the case with Mr. Archong. He is actually the only farmer having a high level of K, as well as a very high level of organic matter, which could be due to the fact that he acquired the farmland in 1995, and it might not have been cultivated before. The low level of K could be a limiting factor to crop production.

3.2.7 Relation between output and soil fertility

The levels of organic matter are very high, regarding that the land has been cultivated for many years. Nitrogen is low, probably because the farmers have harvested recently. The level of phosphorous is fluctuating, and the level of potassium is predominantly low (see appendix G for details).

On the farmlands of four farmers there is a correlation between the organic matter content and the outputs (Mr. Artoo, Mr. Arkang, Mr. Sripan and Mr. Aryae).

On the field of Mr. Uniya the output of maize is high, while the output of peanut is low.

The amount of organic matter is high.

On the fields of Mr. Malaka the output of maize is low, while the organic matter content is high. But his farmer told that erosion occurred on his land.

On the field of Mr. Somsak two soil samples were taken: one showing high organic matter content, and the other showing a low content. But the outputs of both maize and peanut are low.

No information is available, concerning the outputs from two of the farmers (Mr. Achong and Mr. Alepa).

3.3 Working Team C – Livelihood strategy and economic conditions

3.3.1 Tourism

The main occupation of both tribes is farming. Besides that people work as labourer, they migrate and sell souvenirs. Income from tourism is the main off-farm income, as 50% of the households sold souvenirs. This was mainly based on sewing and selling souvenirs. On a good day a souvenir seller made 150-200 Bt. This number should not be understood as an average income from tourism since the field work took place during a tourist season.

Despite this the income from tourism is substantial compared to the income made from agriculture which is 87 Bt/day on average. These amounts are only to be seen as indicators on how important tourism is in the village.

There were no relationship between ethnic belonging and income from tourism as well as relationship between size of landholding and income from tourism.

Another observation was that the available souvenirs in the village and Chiang Mai were very similar to each other all though it was hand made. The souvenir sellers therefore were in unnecessary competition with each other.

The village also had a 'Tourist Centre' in which a restaurant, a small shop and a very small hill tribe museum was based. A guesthouse which was not in use was also situated here.

During our field work we never noticed any tourists buying anything there. The household had no employed in the centre and affected economically thereby only the household that

owned the centre.

Most of the tourists only made a short stop or they trekked through the village on the way to Ban Pha Lai. This village was the final stop for the tourists and made Ban Huai E-ko an unpractical stop for the tourists. The souvenir sellers therefore often walked to Ban Pha Lai, in which the tourists had better time to shop.

One seller expressed a wish to have a souvenir market in the village. In this way the tourists would have easier access to the souvenirs as well as the sellers would avoid running after the tourists most afternoons. Another benefit of creating a souvenir market would be control of the prices of similar goods.



Picture 5: Tourists.

3.3.2 Migration

Only 13% of the villagers had a member who migrated with the purpose to make money, excluding villagers who left to study or to be married outside the village.

Only one household member sends money back to the family. Migration therefore does not seem as a possible solution for the villagers to secure a future livelihood.

3.3.3 Access to credit

In order to intensify their agriculture it is interesting to look into the villagers different formal (banks/funds) and informal (private money lenders) credit institutions. These makes large size agricultural investment possible, such as machinery, irrigation system, land purchases etc.

Short term loans and savings are interesting to look into as they make income spreading possible. Income spreading is important because agriculture is characterised by short periods of income and long periods of expenses (Feder 1988). Unfortunately we did not go into household savings.

The credit institutions that the villagers had access to was mainly the 100,000 Bt fund, the 1 mill. Bt fund and private money lenders. Both funds have been present only a short time in the village.

In average the villagers had loans for 12,200 Bt in credit institutions. They paid in average 13.5% p.a. in interest. In 2001 the inflation rate in Thailand was 2.1% (www.worldbank.org). The general uses of loans are for agricultural purposes, education and consumption, but mainly only for short term investments such as in seed and herbicide. The length of the loans were all one year. In view of the fact that many agricultural inputs e.g. herbicide is used in approximately the same time each year. This system created a state of dependence to the funds, since the same amount is needed each year at the same time to pay back last years loans and to buy new herbicide.

The loans from the 100,000 Bt fund have a 15% p.a. interest rate. There are no restrictions to what the money is used for and loans for consumption is therefore normal. Furthermore are no preventions made against people that take loans only to pass the money to other people to an even higher interest rate.

The loans from the 1 mill. Bt fund have a 10% p.a. interest rate. In this fund restrictions are made to make people invest on a longer term (not for consumption) – especially in agriculture. But still the loan has to be paid back all at one time one year after the loan was taken.

The money in the two funds originates from the government. The profit from the funds stays within the village, and goes to another fund which invests in sports activities, education in community forestry etc.

2-3 private money lenders exist in the village. 27% of the villagers have a loan in one of these. They pay 30-40% p.a. in interest rate. The money lenders only lend to people they know. This ensures the moneylender a knowledge of the borrowers ability to repay, as well

as it enable the moneylender to put pressure on the borrower in a way that formal credit institutions not are able to. This could be social pressure through the village, daily enquiries on repayment or to repay the loan through labour work.

No households had loans in banks and none had any present plans to invest long term in the agriculture. The villagers therefore did not make use of long term credit which is necessary for long term investments.

BAAC and other banks are not active in the village. The farmers gave different reasons to explain why BAAC were not present:

- High interest rates
The BAAC interest rate p.a. is 8-14%, which is a very competitive price compared to the other sources of credit the villagers have.
- Lack of SPK
Holding of SPK is not a requirement to borrow money from BAAC.
(www.baac.or.th)
- Lack of citizen card
Only 13% of the households do not have Thai ID-cards at all.

Neither of the explanations gives sufficient reason that BAAC should not be present in the village. This is most likely due to lack of information in the village about the financial institution.

4. Discussion relating the issues

In this chapter we will discuss our findings and relate them to each other, using our different disciplines.

4.1 Land scarcity

In order to verify our research question, it is nessecary to discuss whether land scarcity is present in Ban Huai E-ko.

Many factors determine whether or not land scarcity exists:

Population growth: In a situation where the population is growing, the natural resources

will be used more intensively, since more people depend on them. This could lead into a decline of the resources. There are two ways of handling this decline; either the land holdings are expanded or the methods used in the natural resource management will be changed in order to intensify the use of the resource (Netting 1993).

Government policy and legislation: Land scarcity is a result of the government policy and legislation, such as laws on citizenship, tenureship and land classification.

Topography: When the land is very hilly, or even steep, it is not easy to access. The topography can therefore limit the land available for agricultural purposes.

Based on the above and due to the fact that each household has 17.5 rai, we assume that land scarcity exists in Ban Huai E-ko. We do not have any precise numbers on the population growth rate in the village, but we assume that it is growing though not rapidly, since most families have 3-5 children.

4.2 Intensification under land scarcity

Many options could be resorted to, in order to overcome land scarcity, depending on the particular context. In the context of Ban Huai E-ko the agriculture is intensified at a low level. The most obvious option is further intensification of the farmland, without deteriorating the natural resources.

Since most of the land has been cultivated during decades, one would expect that the content of organic matter would be low. It is possible that some mistakes were made during the testing in Maejo University. To understand this paradox completely, it would be necessary to do more soil samples as well as more in depths interviews concerning former land use practises.

If we assume that the land is fertile at present, it is still relevant for the farmers to think of maintaining the soil quality, because it will not remain fertile forever.

Even if the villagers did use manure from pigs as fertilisers, it would not be enough to cover the farmland, since the number of pigs is small.

Actually we are surprised that the villagers borrow money to buy herbicides, and not

fertilisers, since weeding can be done by hard manual work.

Many of the farmers expressed that lack of water for irrigation is one of the major problems in the village. Most likely an irrigation system would improve the outputs, and thereby improve the livelihood of the villagers, but such a system is very expensive. The request for irrigation systems is possibly a consequence of land scarcity. If enough land is available the farmers could still get higher outputs without irrigation.

4.3 Access to credit and intensification/investment in agriculture

In order to intensify in agriculture the farmer needs credit to invest. Investment in irrigation systems, machinery and buildings are only profitable in the long perspective. Access to long term credit is therefore necessary. For the villagers in Ban Huai E-ko this would be possible through the government bank BAAC and private banks. The BAAC is not present for uncertain reasons. The private banks are not present in the village, since they demand transferable title deeds as collateral.

Uncertainty of future rights to the land might prevent the farmers from intensifying the agricultural system, but on the other hand long-term investments can prove the farmer's affiliation to the land, and thereby convince the government to issue a title deed. Studies show that when people do not have rights to their land, they do not make long terms investments, such as irrigation systems, tree plantings etc. (Schlager and Ostrom 1992).

But our research shows that the villagers do not embark on long term investments, whether they have SPK or not.

Loans obtained through private money lenders are used for consumption and for agricultural inputs. The loans through the One Million Bt fund are used for short-term agricultural inputs, such as fertilisers and pesticides. The loans through the 100,000 Bt fund are all used for consumption. Since the loans have to be paid back within one year, it is not possible to use these funds for long-term investments. The long-term effect of these funds is therefore doubtful, and is in line with the critics of the funds stating that their main purpose is to boost Thailand's economic growth (pers. comm. Petersen 2003).

4.4 Land scarcity, citizenship and tenure

There are two conditions for getting title deed: Thai citizenship and the proper classification of land.

In 13.3 % of the households none of the family members have Thai ID. These households cannot get SPK on their land. The villagers are not guaranteed SPK even if they are Thai citizens, since land use is illegal in the national park. Only those with Thai citizenship and land in the NFR have the possibility of getting SPK.

In this way lack of Thai citizenship and legal tenure rights lead to land scarcity.

Being a Thai citizen is also vital in regard to other aspects of the villagers live such as migration, work and education, which will be discussed later.

4.5 Tenure and intensification

80 % of the farmers have an insecure tenure to various degrees, since only 0-1 of their plots have SPK. Three times as many Lisu fields, as Akhas, have SPK. This could be due to lack of Thai citizenship, but since 87.7% of the people from both tribes have citizenship, the reason is most likely that the Akha settled later and therefore got the land situated in areas where title deed is not possible to get.

With the insecure tenure we imagine that the farmers do not have an incentive to intensify their agriculture since they do not know if they will keep their land or it will be taken away from them.

We assume that the low level of intensification is due to lack of citizenship and thereby tenure ship, lack of agricultural knowledge and lack of long-term credit.

4.6. Land scarcity and off-farm income

Land scarcity gives the farmers an incentive to look for other income strategies, since they can't rely solely on agriculture. Other means of income are seasonal and permanent migration and tourism. Land scarcity constraints the people from sustaining their livelihood only through agriculture. The main off-farm income is from tourism.

4.6.1 Land scarcity, tenure and migration

Only 13 % of the households have a member who migrated with the purpose of making money, thus migration is not of great importance. This would apparently be due to lack of Thai citizenship, since it is a requirement when applying for a job and when traveling outside the district. This is not the only explanation, since only 24% of the population in the village does not have Thai ID. A more likely factor is the low educational level prevailing in the village, which makes it difficult for them to get a well paid stable job.

There are multiple factors explaining why migration does not seem as a possible solution for the villagers to secure a future livelihood.

4.6.2 Land scarcity and tourism

Tourism is important since it contributes considerably to household's income. Apparently there are fewer constraints attached to it. 50% of the households are selling souvenirs. On a good day a souvenir seller made 150-200 Bt. This number should not be understood as an average yearly income from tourism since we were there during one of the tourist seasons. Despite this the income from tourism is substantial compared to the income made from agriculture, which is 87 Bt/day on average. These amounts indicate how important tourism is in the village.

4.6.3 Land scarcity and market for land

There are several explanations to the lack of a market for land in the village. First of all SPK is not a transferable title deed, and this makes official selling and buying of land impossible, though unofficial selling and buying of land without title deed is taking place. It is only done in a small scale, because the price of land is too high, due to the demographic pressure on the scarce land. Furthermore there are often other incentives to hold land than just to use it as a productive asset. Land is used as legacy to future generations, it provides social status as well as collateral (Bardhan 1999). Thus the price for land may be above the capitalised value of the agricultural income, even for the more productive farmer. If the villagers had transferable title deeds, we would assume that there would be a market for land, but still on a small scale, due to the above mentioned reasons.

Due to land scarcity there is no legal way of expanding their agricultural land. The lack of a

market for land prevents the allocation of land to be optimal³, because it is difficult for the high productive farmer to increase his agricultural income through legal expansions. With low household savings and imperfect credit markets, the more efficient small farmer may thus be incapable of affording the going market price of land. The comparative advantages are therefore not being fully exploited.

4.7 Land scarcity and tribal origin

The tribal origin is related to land scarcity, primarily because the tribes are situated differently in relation to the NP and the NFR. Secondly the size of the land is almost the same for the two tribes, but since the Akha are more people per household than the Lisu, the Akha therefore have less land available. According to the cultural practises the parents give a part of the land to their sons. When the population density is continuously growing, the land will be divided into smaller pieces, which will not be feasible in the long run.

4.8 Tenure and forest use

The classification of the forest is apparently a constraint to the villager's legal use of the forest. But with the CF the use of the forest has now been accepted, though in a restricted area and under certain rules. The CF though should be seen as a benefit, given that it is an alternative to illegal use of the forest, where they risk to be arrested or pay a large fine. But since the status of the CF is insecure no one knows what will happen when the Community Forest Bill is implemented. If the villagers had a secure tenure on the forest it would be an incentive to use the forest more sustainable since it would be for their own benefit (Buch-Hansen 2001, Brenner 2003).

Whether the area is big enough we do not know. The size needed is related to the dependency of the forest product. We did observe people cutting trees in the national park area and saw people carrying bamboo stems to their homes. This could indicate that the size of the CF does not cover their needs.

³ An optimal allocation is not necessarily an even distribution of land.

5. Conclusion

The choice of livelihood strategy depends on what the villagers are capable of, which resources they have available, and the activities required for making a living.

At present the major livelihood strategies in Ban Huai E-ko are agricultural production for consumption and for sale, the use of forest, obtaining loans, tourism and migration out of the village. The livelihood strategy is determined and limited by the constraints the villagers face.

The main constraint, which limits the villagers from securing and improving their future livelihood, is land scarcity.

The most important factors to land scarcity are population growth, government policies and legislation (laws on citizenship, tenureship, land classification) and topography.

In Ban Huai E-ko, farming is the main occupation. The farming system could be described as somewhere between subsistence and commercial farming. At present fertilisation is not a part of the agricultural practise. Though the soil samples indicate high organic matter content, this is most likely to decline due to the fact that the land has been cultivated over decades. The most obvious option of securing the future livelihood is to intensify the agricultural system. But intensification is limited by the lack of citizenship and thereby tenure ship, the lack of agricultural knowledge and the lack of long-term credit.

In order to get tenure ship for land, a farmer has to be a Thai citizen and the land has to be situated outside the national park.

Long-term investments can not be obtained in Ban Huai E-ko, because:

- The BAAC and the private banks are not present in the village.
- The loans obtained through the One Million Bt fund and the 100,000 Bt fund have to be paid back within one year. Most long-term investments benefits after at least a couple of years.

The alternatives to intensification are off-farm activities, such as tourism and seasonal/permanent migration.

Fifty percent of the households have one or more family member involved in selling souvenirs, and thereby contributing to the income.

Migration is not of great importance, because the migrated family member in most cases does not support the family in the village financially.

We assumed that we would identify differences between Akha and Lisu hill tribes. Actually the livelihood strategies and constraints are very similar. The biggest difference is that the Akha hill tribe has less land available per person, than the Lisu hill tribe.



Picture 6: Village meeting, group photo.



Picture 7: The future of Ban Huai E-ko.

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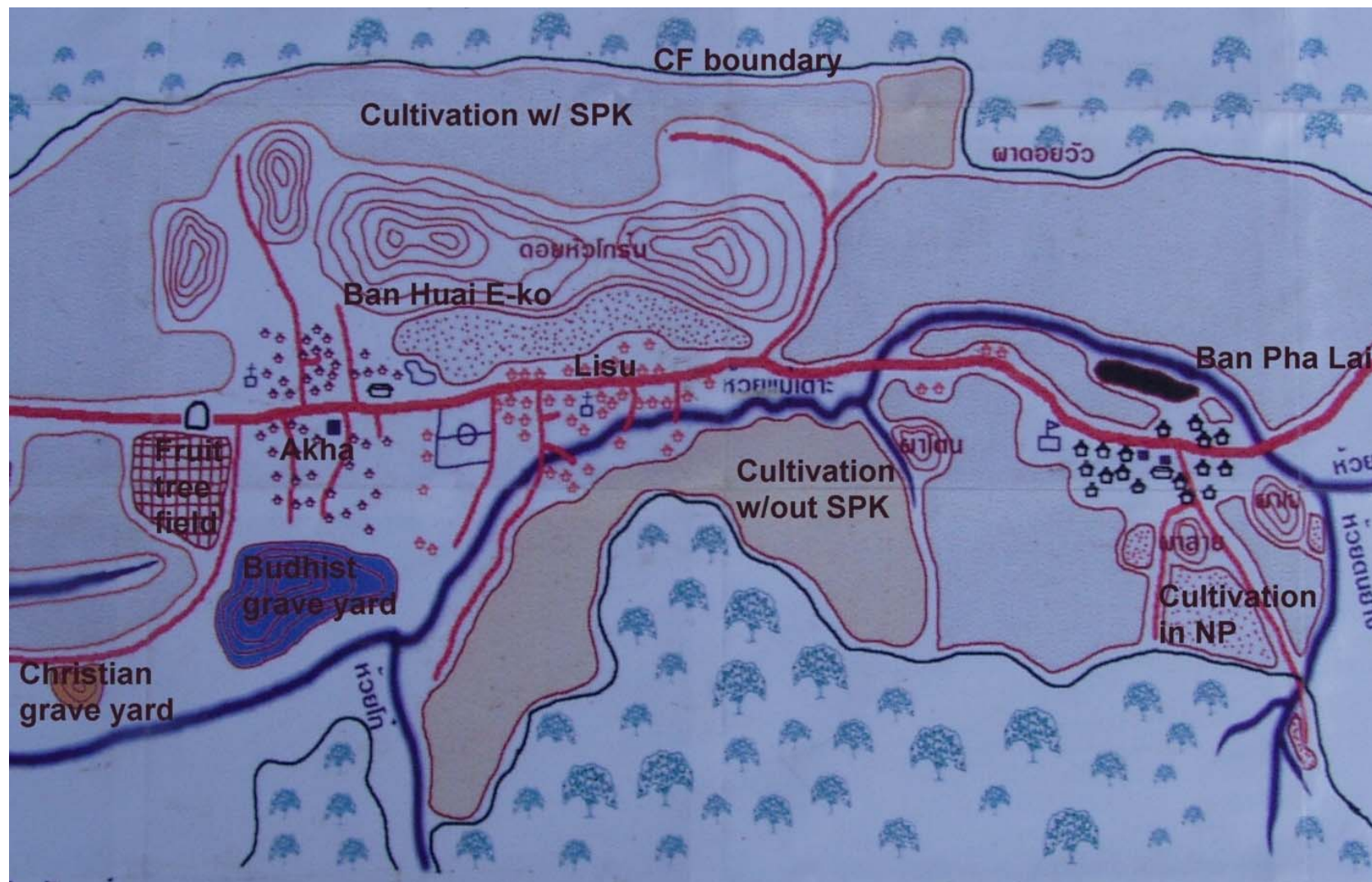
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7. Appendices

Appendix A: Village map



Appendix B: Questionnaire

Questionnaire : Location 2 Ban Huai E-ko (21/01/03)

Address บ้านเลขที่ :

Date วัน :

Time เวลา :

Interview group กลุ่มสัมภาษณ์ :

General questions to household characteristics

1. Name of interviewed:

ชื่อและนามสกุล

2. Gender

Male

Female

เพศ

ชาย

หญิง

3. How many years have the household lived here?

เป็นระยะนานเท่าใดแล้วที่ครอบครัวท่านพักอยู่ในพื้นที่นี้?

3.1 Where did your household come from ?

มาจากไหน.....

--	--	--	--	--	--	--	--	--

5. Migration รายได้จากการทำงานนอกพื้นที่

5.1 Have any household member left the village? มีสมาชิกในครัวเรือนที่ย้ายออกไปจากหมู่บ้านหรือไม่

5.2 Why did they leave? ทำไมถึงย้ายไป

Land use การใช้ที่ดิน

#	Size (rai) ขนาด (ไร่)	Where (map) สถานที่ตั้ง	Crop พืชที่ปลูก	Output(Kilo/baht/year) ปริมาณผลผลิตทั้งหมด (ก.ก./บ./ปี)	What is the output for? ผลผลิตเอาไปทำอะไร	Crop system ระบบการปลูก	Certificate ชนิดเอกสารสิทธิ์	Time of acquirement ได้ที่ดินมาเมื่อไหร่	Renting/ ownership ที่ดินเป็น ที่เช่า/ เจ้าของ	Costs if renting ราคาที่ดินถ้าเช่า	Contract farming เกษตรกร พันธะสัญญา (Yes/No)	Normal,more or less output ผลผลิตเมื่อเทียบกับปีก่อน ๆ
7												

6. How your total yield have improved or decreased in the recent five past year?

ในระยะ 5 ปีที่ผ่านมาผลผลิตทั้งหมดของเกษตรกรเป็นอย่างไร

7.

7.1 Do you use any fertilizers?

ท่านใช้ปุ๋ยหรือไม่

7.2 Do you use any pesticides?

ท่านใช้สารกำจัดศัตรูพืชหรือไม่

Do you use any machinery?

ท่านใช้เครื่องทุ่นแรงหรือไม่

8. Livestock ปศุสัตว์

Type of animals ชนิดสัตว์	Purpose of keeping animals จุดประสงค์การเลี้ยง	How and where are they kept เลี้ยงอย่างไรและเลี้ยงที่ไหน
1.		

2.		
3.		
4.		
5.		

9. Forest (ป่าไม้)

Type of forest ชนิดของป่า	Use of forest การใช้ป่า	For what purpose do you use the products of the different types of forest? ท่านมีวัตถุประสงค์อะไรบ้างในการใช้ผลผลิตจากป่าแต่ละประเภท

9.1 Do you have any rules or principles for using the different types of forest?

ท่านมีการตั้งกฎกติกาในการเข้าใช้พื้นที่ป่าแต่ละประเภทหรือไม่

9.2. Do you do anything to prevent forest fire? มีการป้องกันไฟป่าหรือไม่

10. Off-farm income รายได้นอกภาคการเกษตร

Tourism การท่องเที่ยว

10.1. Do you have any income from tourism? ท่านมีรายได้จากการท่องเที่ยวหรือไม่

10.2. Do you have any other income sources ? (e.g. from the government) ท่านมีรายได้อื่นๆ อีกไหม เช่นจากทางรัฐ

11. Financial issues ด้านการเงิน

Access to credit in general การเข้าถึงเงินสินเชื่อ

11.1. Where do you have access to credit? ท่านสามารถกู้ยืมจากแหล่งใดได้บ้าง

11.2 Do you have access to group collateral? ท่านมีบุคคลหรือทรัพย์สินในการค้ำประกันหรือไม่

Loans Taken การกู้ยืม

11.3 Have you taken any loans? ท่านมีการกู้ยืมหรือไม่

11.4. If yes, who did you borrow from? ถ้ายืม ท่านยืมมาจากใคร

11.5 How much money was borrowed? ท่านกู้ยืมเงินมาเท่าไร

11.6. What are the conditions for the loan (interest rate, length, payment)? เงื่อนไขในการกู้ยืมเงิน (อัตราดอกเบี้ย ระยะเวลาการกู้ จำนวนเงินคืน)

11.7. What do you need the borrowed money for? ท่านใช้เงินที่ยืมมาเพื่ออะไร

11.8. What did the household offer as collateral for this loan? ครอบครัวท่านใช้หลักทรัพย์อะไรในการค้ำประกันในการกู้

Assets ประโยชน์ต่าง ๆ

11.9. Have you ever bought any land? ท่านเคยซื้อที่ดินไหม

11.10 Have you ever sold any land? ท่านเคยขายที่ดินไหม

11.11. When? เมื่อไหร่

Investments การลงทุน

26. Do you have any specific plans on investing in anything? คุณมีแผนการที่เฉพาะเจาะจงในการลงทุนเรื่องอะไรบ้าง

27. Do you have plans investing in agriculture? มีแผนการลงทุนด้านการเกษตรบ้างไหม

28. Do you have plans investing in tourism? มีแผนการลงทุนในด้านการท่องเที่ยวบ้างไหม

29. Do you have plans investing more in education of your household? มีแผนการลงทุนสำหรับการศึกษาของครัวเรือนหรือไหม

30. How do you plan to finance these things? คุณมีแผนในการลงทุนในเรื่องที่กล่าวมาอย่างไรบ้าง

Risks ความเสี่ยงต่าง ๆ

31. Comparing the last 5 years, which was the worst year for the household? โดยเปรียบเทียบระยะเวลา 5 ปีที่ผ่านมาปีไหนเป็นปีที่ครัวเรือนต่ำที่สุด

32. Why? เพราะอะไร

33. Did the household receive help in the form of money or goods in that year?

ครอบครัวท่านได้รับความช่วยเหลือทางด้านเงินหรือสิ่งของ

34. Does the household hold any kind of insurance? แล้วครัวเรือนนี้มีการประกันภัยอะไรบ้างหรือไม่

35. Do you play the lottery and gamble? มีการเล่นหวย หรือการพนันหรือไม่

Organizations องค์กรต่าง ๆ

36. Participation and Membership of the groups and organizations

การเข้าร่วมกลุ่มและองค์กรและความเป็นสมาชิก

Name of groups and organizations ชื่อกลุ่มและองค์กร	Who ใคร	Position ตำแหน่งในกลุ่มและองค์กร
1. Leaders Group (Tao, Headman , Assistant, etc) กลุ่มผู้นำชุมชน (อบต. ผู้ใหญ่บ้าน ผู้ช่วย เป็นต้น)		
2. Religion group กลุ่มศาสนา		
3. Women's group กลุ่มสตรี		
4. Agriculture group กลุ่มเกษตรกร		
5. Healthcare volunteer group กลุ่มอาสาสมัครสาธารณสุข (อสม.)		
6. Forest protection volunteer group กลุ่มอาสาสมัครรักษาป่า		
7. RFD		

สำนักงานป่าไม้		
8. IMPECT Organization องค์กร IMPECT		
9. Others (Specify) อื่น ๆ โปรดระบุ.....		
10. Others (Specify) อื่น ๆ โปรดระบุ.....		

37.

Name of groups and organization ชื่อกลุ่มและองค์กร	How much support do you derive from them? มีการช่วยเหลือของกลุ่ม/ องค์กรต่าง ๆ อย่างไร				What are the activities of the group? กิจกรรมอะไรบ้าง
	A lot มาก	Fair ปานกลาง	Less น้อย	None ไม่มี	
1. Leaders Group (Tao, Headman , Assistant, etc) กลุ่มผู้นำชุมชน (อบต. ผู้ใหญ่บ้าน ผู้ช่วย เป็นต้น)					

2. Religion group กลุ่มศาสนา					
3. Women's group กลุ่มสตรี					
4. Agriculture group กลุ่มเกษตรกร					
5. Healthcare volunteer group กลุ่มอาสาสมัครสาธารณสุข (อสม.)					
6. Forest protection volunteer group กลุ่มอาสาสมัครรักษาป่า					
7. RFD สำนักงานป่าไม้					
8. IMPECT Organization องค์กร IMPECT					
9. Others (Specify) อื่น ๆ โปรดระบุ.....					
10. Others (Specify) อื่น ๆ โปรดระบุ.....					

38. What are the three major problems for you in the village?

ท่านคิดว่าอะไรคือปัญหาหลักของหมู่บ้าน โปรดระบุมา 3 ปัญหา

Appendix C: Land classification and tenure status

Thailand has a long history of forest policies. One decisive policy is the Cabinet Resolution of 1985 on Thailand's National Forestry Policy. It is the blueprint for later forestry policy by the government and states the aim of a forest cover of 40% of the country, where 15% is designated economic forest and 25% protected forest. This area is called National Forest Reserve (NFR).

The NFR constitute 48% of the total land area and are under the administration of the Royal Forest Department. Of this area probably one third can be designated forest in a real sense, since a lot of it is covered by secondary forest, agriculture, plantations or no forest at all (Brenner et al., 1999; Ewers, 2000) (see chart 1).

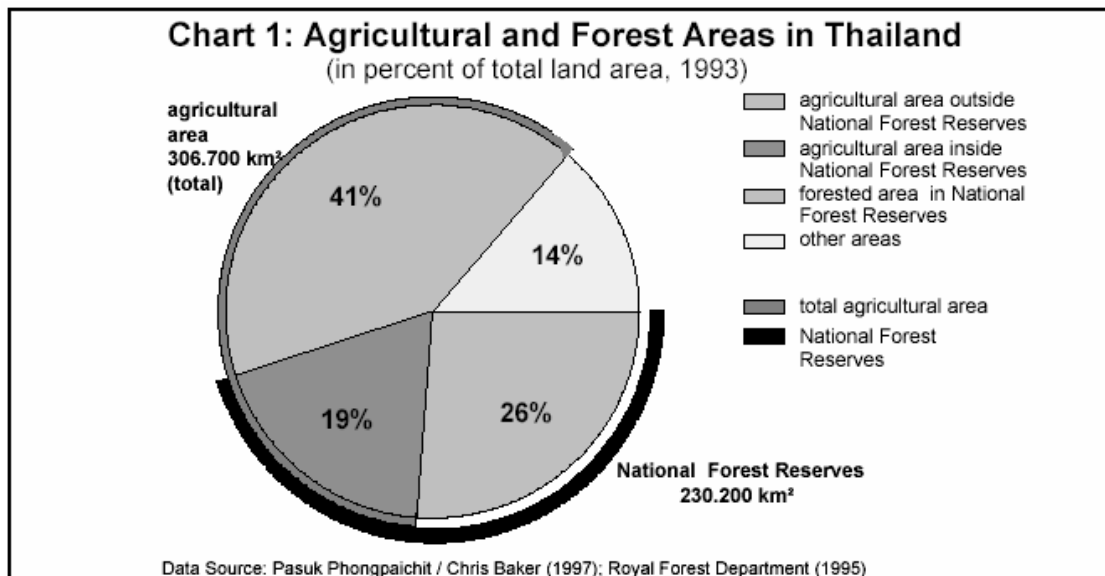


Chart 1: 48% of total land is NFR area (black). Only 26% of the total land is NFR with forest (grey).

Appendix D: Establishment and rules of a CF

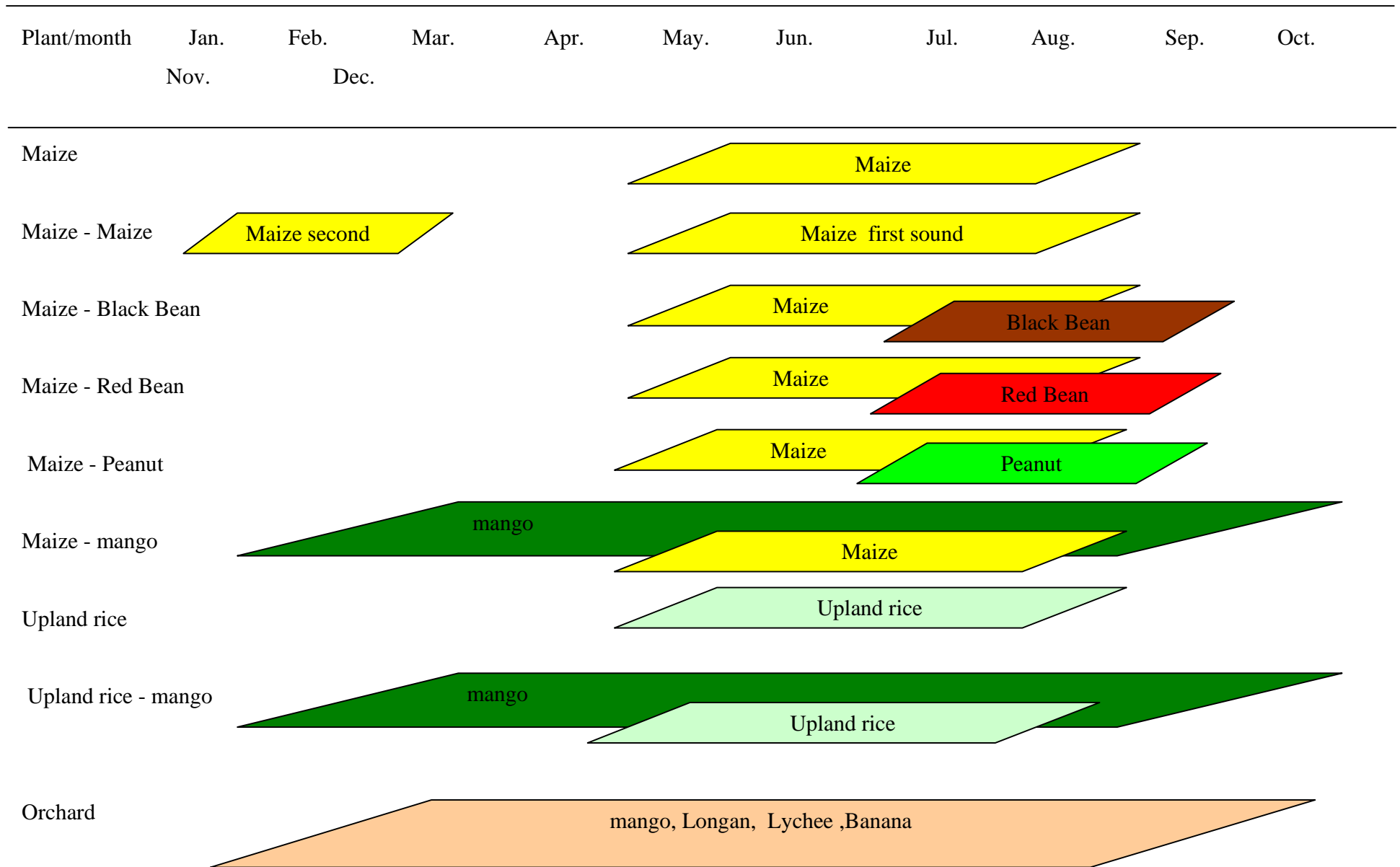
The establishment and the rules of the CF are made in co-operation between the villagers, the NP office and the local NGO.

Rules

The CF is divided in two zones: Utility zone and conservation zone. In the conservation zone no activities are allowed. In the utility zone the villagers can collect NTFP and hunt e.g. wild pig and birds, but not species under danger of extinction. It is also possible to cut trees, but only for building and repairing houses, not for business purposes. It must be allowed by the Community Forest Committee of the village. This committee consists of both villagers and a NP or RFD officer. The rules are set by the NP Office in corporation with the local NGO.

Most people know these rules, but if they obey them we cannot tell. We did see some people cutting trees in the NP area and the GPS survey of the two the agricultural land shows that forest encroachment is taking place as some land is situated in the NP (the hatched area).

Appendix E : Crop calendar



Appendix F: Parameters used in the testing of soil samples

Organic matter

The organic matter content of a soil in an untouched forest is normally around 10%, and of a soil under cultivation is normally around 1% (Neergaard, 2003 pers. comm.).

The number of years that the field has been cultivated plays a role in relation to the content of organic matter. Most of the organic matter will be removed during the harvest, when a piece of land is cultivated, and the organic matter content will decrease, unless some kind of fertilization will take place. If the plant residues are left on the fields after harvesting, or even incorporated into the soil, the organic matter will increase.

Nitrogen – ammonium and nitrate

The growth of a plant is often more limited by deficiencies of nitrogen than of any other nutrient. A plant takes up nitrogen almost entirely as the nitrate anion NO^3 and as the ammonium cation NH^4 , and these compounds are very mobile in soil.

The decomposition of organic matter, and therefore a part of the nitrogen supply is related to the microbial activity, which again depends of the soil temperature, soil moisture and the presence of food for the microbes. The amount of available nitrogen is most likely low during dry season, and at a maximum with the beginning of the wet season, since nitrogen absorption appears to be closely related to movement of water in the soil (Ahm P.M. 1993: Tropical soils and fertiliser use. Longman Scientific and Technical).

Phosphorus

Most of the total phosphorous in the soil is almost insoluble, because it is either bound into the organic matter or combined with other elements, particularly iron, aluminium and calcium. The phosphate anion is relatively immobile, which means that the phosphate ions do not move very far away from their origin, and that the plant depends on a good root system to be able to locate these ions. But with high organic matter content and a good rate of decomposition, the release of phosphate ions should be adequate for crop production soil (Ahm P.M. 1993: Tropical soils and fertiliser use. Longman Scientific and Technical).

Potassium

Potassium originates from the chemically weathering of minerals. The available potassium is held by the soil colloids and in a soluble form. The unavailable potassium is bound in a non-soluble compound in un-weathered minerals. The slowly available K is found in the organic fraction of the soil, and it will

be released when the organic compounds are mineralised soil (Ahm P.M. 1993: Tropical soils and fertiliser use. Longman Scientific and Technical).

Appendix G: Relation between output and soil fertility

The results of the soil samples are related to the outputs from each farmland. Unfortunately it is not possible to take the cropping system of each farmland into account, since a lot of information concerning the place, where the samples were taken, is missing. When we use the term per year, we mean that it is the present year. The data originates from the questionnaires and the soil sampling.

Mr. Arche Archong, Akha hill tribe:

His land was acquired in 1995. The output is constant in terms of quantity. The farmer remarked that he had a bad soil quality, but according to the soil sampling his soil has the highest content of organic matter of all the samples analysed, which indicates high soil fertility. Unfortunately we do not have specific information about the output per crop.

Mr. Artoo Wuiyue, Akha hill tribe:

According to the soil samples the organic matter content is 3.79%, in a general sense this value is high, but comparatively it is low. The output of maize and peanut are moderate, when comparing the crop outputs in table 5. The moderate output could be a consequence of moderate soil organic matter content.

The overall yield is improving every year.

Mr. Arkang Mubogo, Akha hill tribe:

The outputs of maize and peanut are high, just like the organic matter content is high (5.05%). The high outputs could be due to high soil fertility.

Mr. Uniya Suepa, Lisu hill tribe:

The output of maize is high, while the output of peanut is low. The organic matter content is high (6.08%). The output is stable.

Mr. Alepa Saiya, Lisu hill tribe:

Unfortunately we do not have information concerning the actual output.

The family is renting part of their farmland. The overall yield has decreased, but the yield of rice has improved.

Mr. Malaka Saebah, Lisu hill tribe:

The farmer mentioned that the soil quality on this plot was low, due to erosion, but according to the samples the organic matter content is relatively high (4.39), and the land gives the highest average income (Bt/rai/year). The total output of the yields is improving, though fluctuations occur in some year.

Mr. Somsak Ngurpa, Lisu hill tribe:

Two samples were taken from the farmlands of Mr. Somsak: One sample on the flat land down slope, and one sample from the upland field, up slope. The results of these samples show that the organic matter is much lower on the flat land. But on the other hand the level of P is high down slope, and the level of P is low up slope. One would expect that the organic matter would be higher down slope than up slope, due to erosion. Therefore it is difficult to conclude anything from these samples

Mr. Somsak has the lowest average income (Bt/rai/year), but he also has the lowest amount of organic matter (OM= 2.21). Unfortunately we do not know exactly which field is located where. The output of maize is increasing, whereas the output of mango is decreasing.

Mr Sripan Somsak, Lisu hill tribe:

He can not estimate the trend of the yield. The output is high, and so is the organic matter content.

Mr. Aryae Chue Mauko, Akha hill tribe:

The overall trend of the yield is not good. The output on the average, and so is the organic matter content.