

## **Understanding poverty in Ban Khlong Bong Phattana, Nakhon Ratchasima Province, Thailand**



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**April 2007**

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## **Abbreviations**

TAO Tambon Administrative Organization

PRA Participatory Rural Appraisal

NGO Non Governmental Organization

SPK04-01 Sor Por Kor 04-01

PBT-5 Por Bor Tor 5

ppm Parts per million

SPSS Statistical Package for Social Sciences

ALRO Agricultural Land Reform Office

DLA Department of Land and Agriculture

## **Abstract**

Poverty is a big bottle neck to development especially in developing nations. Thailand has undergone progressive economic development in the urban sectors, while the rural areas, the Nakhon Rachasima province among others are still facing underdevelopment. Our study area, Ban Khlong Bong Phattana is situated in this province in the North Eastern Thailand and the objective of this report is to investigate and understand the situation of poverty in this village.

Understanding poverty can be a complex and relative process varying in different contexts; however, to analyze and assess poverty we approach the concept using the villagers' perspectives. Agricultural insecurity, landlessness, debt and social factors will be explored in depth in this report through quantitative and qualitative methodologies. These factors are described by the villagers themselves as contributors to poverty, but besides from contributing to poverty they can also be viewed as consequences of it. This is the main point as poverty and the various indicators related to it thus are interlinked and interdependent.

**Key words:** poverty, Ban Khlong Bong Phattana, land tenure, debt, environmental risks, illiteracy

## **1. Introduction:**

The purpose of the research carried out in Ban Khlong Bong Phattana was to understand the poverty of this area. This includes understanding poverty as a concept, the livelihood of the villagers within the community and the factors interconnected with poverty.

Thailand has over the last 50 years gone through a rapid development with industrialization and globalization. The agricultural sector accounted for 2/5 of Thailand's GDP in the 70s, but today this is down to less than 1/5. Today, the industrial sector contributes just as much as the agricultural (Chakriya Bowman 2004), though Thailand still stays the main exporter of rice and cassava. A large number of the population is still concentrated in the rural areas, contributing to agriculture and the agricultural area makes up around 40-50% of the total land area. People are struggling to compete with the industry, which is hard, mainly because the rural areas are the poorest in Thailand. Almost nine out of ten poor live in villages, and more than half of all the poor in Thailand live in rural Northeast (Thailand Northeast Economic Development Report, 2005). Furthermore we find that within the rural areas the North Eastern Region is one of the poorest. People in this area got a total amount of 31,351 Baht or about US\$ 784 in 2004 (National report 2006 and Chakriya Bowman 2004).

The study area Ban khlong Bong Phattana is a small village in the North Eastern Thailand, more specifically the Nakhon Rachasima province (see fig 1). It was founded 40 years ago and was split in two in 2001 because of growth in population and now consists of 55 inhabited households, most of them doing agriculture<sup>1</sup>.

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<sup>1</sup> Information obtained from the village headman (March, the 9th).

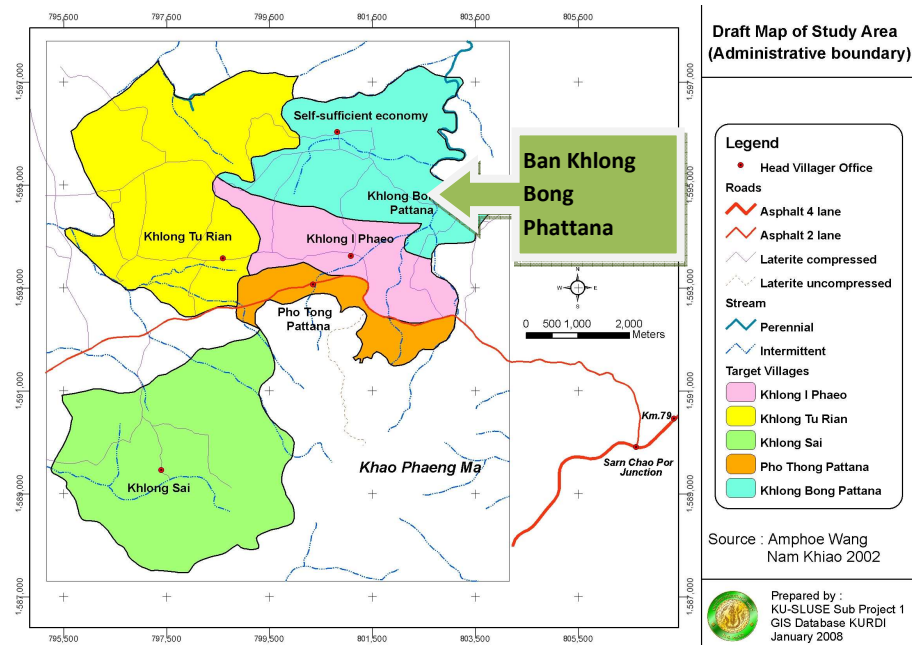


Fig.1) Map of administration boundary of the study area

We found it interesting to investigate the actual situation in the rural areas focusing on the poverty which we assumed must be a constraint to the livelihoods and the development in the small villages a. The main constraints being explored in the report are the environmental risks, landlessness and debt as factors interconnected with poverty. In addition, we will also look into the social implications of poverty. First of all, the attempt to understand poverty has demanded a certain methodological approach which will be explained later. Furthermore, the data acquired through the methods will be analyzed according to the main objective; understanding poverty. Correlations and interdependency between the relevant causes and effects of poverty will be shown as well as an insight into the actual strategies used by people to cope with poverty.

## 2. Methods

### 2.1 The outcome of the methods used:

Our basic research activities consisted of a combination of complementary field techniques such as observing, listening and asking questions, which at the same time are a trade –off between the

qualitative and quantitative approaches (Babbie 2000). The methods were selected to achieve an understanding of the factors related to poverty in Ban Khlong Bong Phattana.

Poverty is very broad and relative, so the best thing we could do in order to get a clear meaning of this concept related to our village, was to actually live in the area of study and explored the local perception of poverty and the factors related to it. To obtain a contextual understanding of poverty we decided to let the villagers themselves define it through a wealth ranking PRA exercise. This turned out to be a profitable method, as the villagers were quite aware of their own perception of poverty and could easily give us names and locations of each villager. We were pleased to find out that people spoke quite freely about their own wealth status. Otherwise wealth ranking could have failed, as poverty is can be a sensitive issue.

In order to understand the poverty in Ban Khlong Bong Phattana, we looked at the criteria and factors mentioned by the villagers in the PRA exercises: wealth ranking, problem ranking, community history and focus group discussion on poverty. The villagers concentrated mainly on crop productivity, land insecurity, debt and low level of education as aspects of poverty.

The questionnaires were used to collect quantitative data about landownership, crop productivity, inputs, off-farm work, education and loans that were later analyzed through statistical software, SPSS. The results were used as indicators of agricultural insecurity, landlessness, wealth status and debt and later cross-checked and supplemented with data from interviews and PRA exercises. At the same time, they represent the basis for finding correlations among the different aspects related to poverty. For the questionnaire survey, our sampling design was simple random sampling and when calculating the size of our sample, we used the formula for small population :

$$N = \frac{Z^2 (0.25)N}{Z^2 (0.25) + (N-1)Cp^2}, \text{ where :}$$

$Z\alpha$  = Z score for various levels of confidence  
 $Cp$  = confidence interval in terms of proportion  
 $N$  = population size  
 (Rea, L.M. et al. 1997)

We chose our informants for the interviews and participants for PRA exercises from the respondents of the questionnaires, this way saving time and covering all ranges of categories that



we needed: landowners and landless, wealthy and poor, well educated and less educated, persons with different levels of debt and villagers that work on their own land or somebody else's land. Having respondents with all these different backgrounds was very useful for our PRA exercises, because each issue was discussed always from different points of view.

The PRA exercises were beneficial for the villagers, as they gave them the opportunity to interact with each other and become aware of their most urgent problems: debt, landlessness, low quality of soil, high costs of inputs and low level of education. These problems were identified during problem ranking and focus group discussion

The in-depth interviews gave us the individual perception of poverty and, in addition, depicted the villagers' livelihood strategies as alternatives to their current situations facing low crop productivity, landlessness, debt and low level of education.



We conducted interviews with key informants in order to triangulate some of the data and some of our sources of information, also to collect data that we could not obtain through the questionnaires. Our key informants were chosen in a convenient way. Our driver, with whom we spent every day, was picked as key informant as he lived the village and knew all inhabitants. The village headman was used as an expert informant as he also knew every villager as well as

the history of the village, official rules and laws and the development in the village. He also served as an important buffer between us and the villagers, as he could make arrangements for our interviews. We chose our last key informant, a TAO member who apparently took pleasure in accompanying us to interviews, because of his position in the village and knowledge about local authorities.

Through informal conversation with the villagers and in particular the TAO member and the driver, we acquired information about the daily life and general situation of the village, information that we did not get through the interviews.

Using purposive sampling, we took soil samples from 5 maize fields and 5 cassava fields, to obtain representative data about level of nutrients in the soil and thereby soil fertility. The soil analysis results indicated a low level of nutrients in the soil<sup>2</sup>, and therefore we conducted interviews with the same farmers, investigating correlations between low soil quality and poverty. We collected data about the inputs they use, crop productivity, income from selling crops, debt and livelihood strategies. Based on the information acquired, we could relate the condition of the soil to costs of inputs, crop productivity, debt, landownership and poverty.

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<sup>2</sup> For description of the procedure see appendice



## **2.2 Problems encountered**

Unavailability of the villagers was one of our main problems as we could not carry out all of the interviews planned. It turned out that many villagers were looking for work during the dry season and therefore spent most of their time outside the village. Due to this we had to reschedule the whole time line regarding our field activities, but it also made us realize the need of adjusting to the field and being flexible. Besides from being a constraint to our work, it gave us important information about the villagers. The unavailability of the villagers was an indicator of the low income from agriculture especially in the dry season. Furthermore, we experienced unwillingness from the villagers to participate in our research (that is, being interviewed or meeting with us) more than once. The villagers simply did not wish for us to come as often as we did.

The language barrier made us lose the exact sense of words and might have biased our results. When a translator is used, it is always important to keep in mind that the information not only is being translated, but also interpreted. Furthermore, some information has probably been lost through translation, which is a fact we have had to take into consideration and dealt with. We did

additional interviews to obtain missing information and confirmed our data with our key informants.

Participant observation on the field was not feasible, because March is in the dry season and most farmers were just waiting for the rain to come.

## **3. Results**

### **3.1 Environmental risks and agricultural insecurity**

To understand the level of poverty in Bon Khlong Bong Pattana village, assessment and analysis of all encompassing factors related to poverty are very relevant. Hence, by applying different methods, it was found that the villagers' principal economy is based on agriculture, especially crop production. However, as it will have discussed in the preceding sections, the environmental risks are the major sources of agricultural insecurity due to low crop productivity or failure in cultivating crops.

#### **3.1.1 Crop production**

The main occupation in Ban Khlong Bon Phattana is crop production as it was mentioned in the interview with the village head man and the community history. According to Mr Pornpiroon, thirty years ago, the villagers grew mainly field crops like rice, castor oil, maize, cotton and cassava despite primarily maize and cassava now. Likewise, the community history PRA exercise has depicted that at the establishment of the village there were only five people whose livelihood mainly centered on the production of maize and rice.

The questionnaire survey analysis shows that currently the villagers rely mainly on maize and cassava with 48, 7% and 28,2% arable land coverage respectively.

Further on, we will explain how crop productivity is constrained by environmental risks like deforestation, drought, flooding, poor soil quality all contributing to agricultural insecurity for most of the farmers, which impacts on their welfare.

### **3.1.2 Deforestation and drought**

Thailand is among many countries in Asia that are faced with the destruction of forest lands. The social Science Association of Thailand (1991) noted that the Thai government in 1964 resolved that 40 percent of the country should be kept as forests. But by the 1980s, the actual forest remaining was around half of this proportion. The motivation for agricultural expansion in the forest area was to meet the export demand of the country (Phongpachit et al. 1998).

The study area, Ban Khlong Bong Phattana, is a village with little forest coverage. This is substantiated from the village observation and interviews. Mr. Wischiam, a 50 year old villager, made a remark that thirty years ago the village was covered with forest. As also shown in fig. 2, in our village there is less forest than in the neighbouring villages due to the fast expansion of arable land.

As a result of the degradation of forest, the area is encountering the loss of environmental balance and therefore drought, flooding and soil erosion occur. These lead to bad soil quality, diminished cultivated area and ultimately low crop productivity and have direct consequences on the villagers' livelihoods as they obtain little outputs from their land and less income.



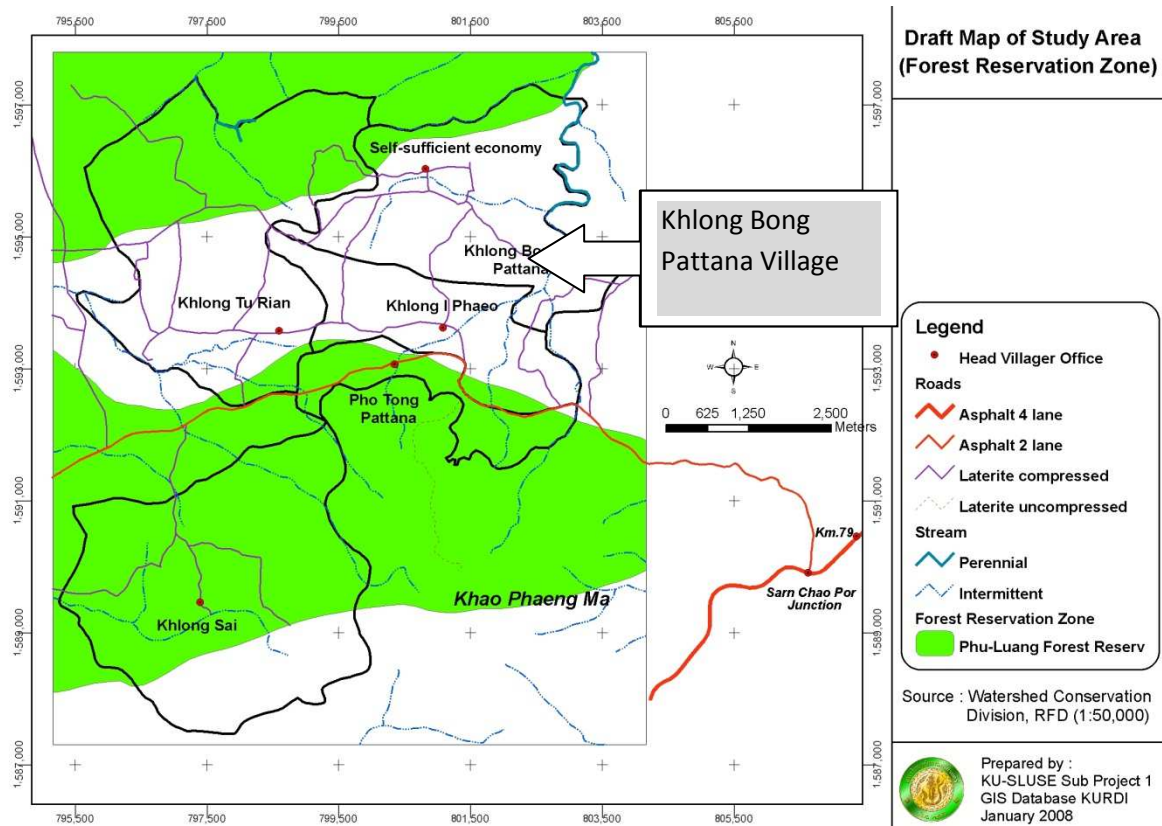


Fig.2) Forest reservation zone of the study area

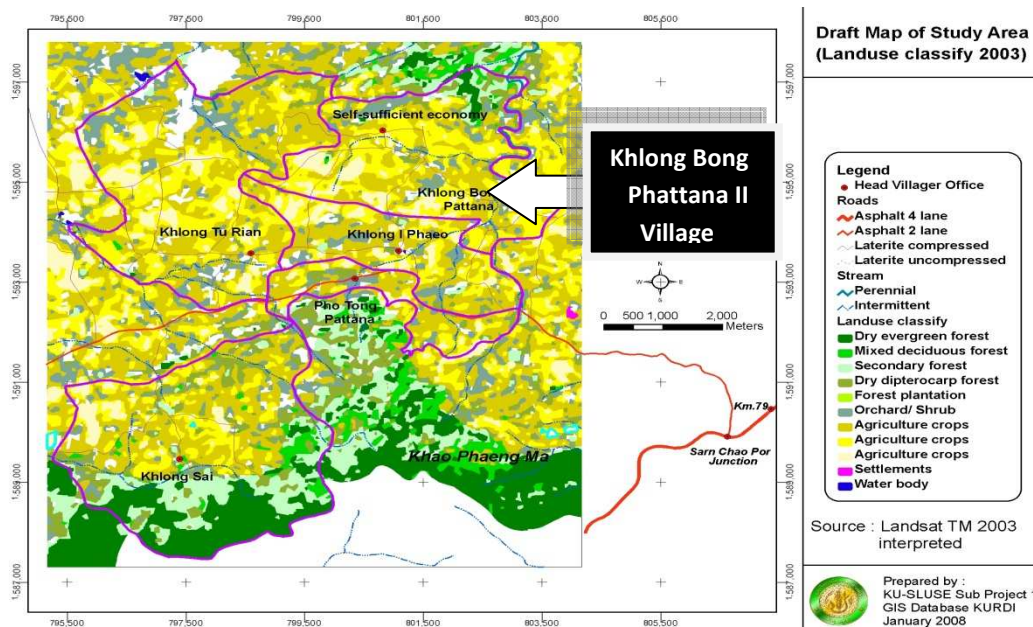


Fig. 3) Map of land use classification

According to Mr. Pornpiroon, the head man of the village, and Mrs. Jaroon Nowing, a village woman, due to the deteriorated forest status, drought has become a very prevalent crop productivity constraint in Ban Khlong Bong Phattana. The climatic changes in the area have resulted in the changing pattern of the cropping system, and migration to the towns in search of work as an alternative to agriculture. The villagers have tried to adjust the growing period to climatic conditions by cultivating maize and cassava two times a year in order to obtain yield for sale.

Clearly, drought is negatively influencing crop production by creating agricultural insecurity. The low crop productivity impacts on the well being of the villagers because they do not have yield for sale and therefore do not make profit.

The accessibility of water is another limiting factor for crop productivity and at the same time illustrative for the general level of poverty in the area of study, as it will be further explained. The Northeastern region has less irrigation than other regions as irrigation is also more expensive there (Thailand Northeast Economic Development Report 2005).

There are ponds in the village, but in order to be able to use the water from them, an electric pump is needed, which is unaffordable for the majority of the villagers. As Mr Narin Chinnawan, the village TAO officer explained, only five persons can afford such a pump for taking out water and using it for agriculture.

### **3.1.3 Low soil productivity**

Deforestation has other destructive effects like floods, soil erosion and low soil quality, all lowering the crop production. From the six in-depth interviewed farmers, 100 percent burn their land intentionally and 66.7 percent never rotate their crops, monocropping having important effects on soil depletion. All of the interviewed explained that they are ploughing their land along the slope rather than against the slope to avoid tractor accidents, this way aggravating soil erosion. All these cumulative problems are adding up to the poor forest status of the area leading to low soil fertility. Since soil fertility is a primary factor for high crop productivity, the deteriorated soil has a significant impact on lowering the yield, which further deprives them of the most important source of income, namely from selling their crops on the market.

The soil analysis results support the data from the interviews, showing that generally the nitrogen and the potassium content in most of the fields are in a bad condition: 100 % of all cassava and 80% of the maize sampled fields (see fig. 1 and 2, and table 1 appedix). The information was triangulated through problem ranking, where the low quality of the soil was mentioned as one of the severe problems in the village (table 1).

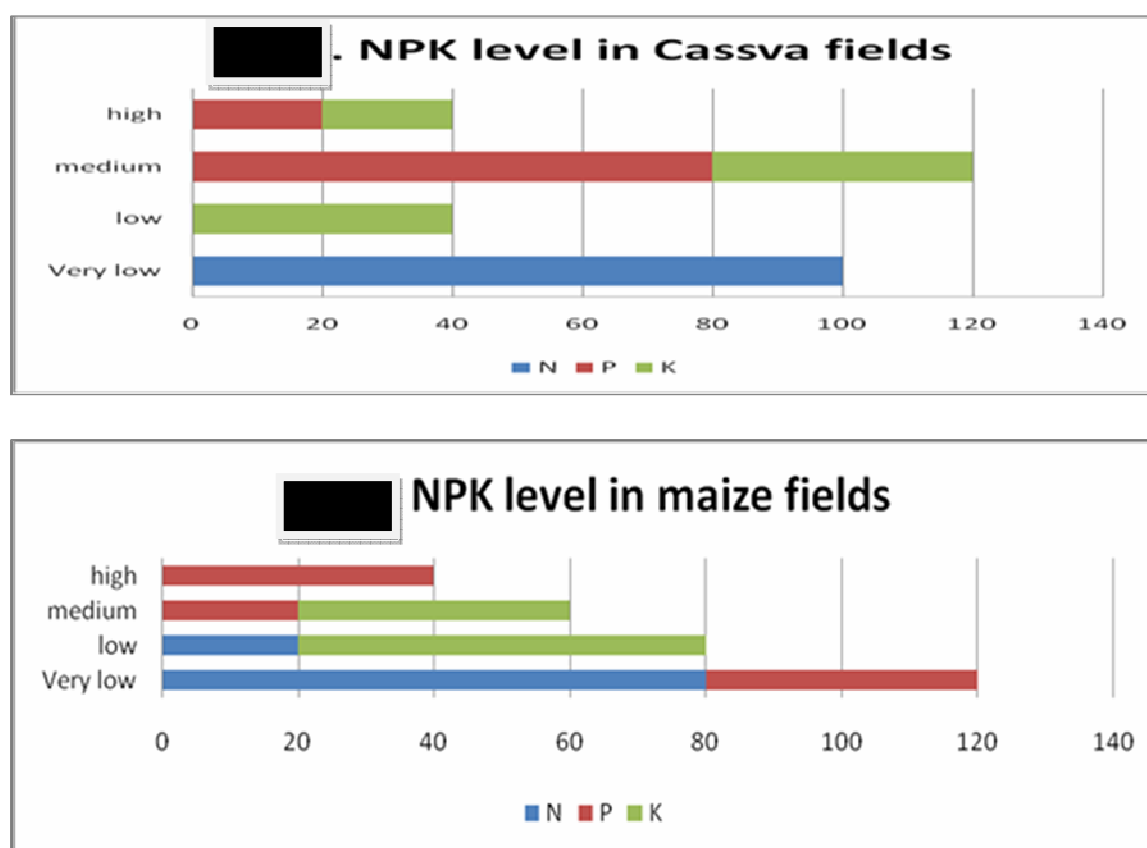


Fig. 4 & 5) NPK levels in cassava and Maize fields.

List of villagers major Problems identified	Severity
Debt	1
Landlessness	2
High cost of inputs	3
Poor soil quality	4
Low level of education	5

Table 1 Villagers Problem Ranking PRA exercise (1 most severe, and 5 least severe)



The above mentioned environmental risks make the use of fertilizers imperative, but as seen from the problem ranking (see table above) and interviews, it is a bottle neck in our village to buy fertilizers. The same statement has come up during informal conversation with Professor Dr. Piya Duangpatra, Senior Soil Scientist in Kasetsart University, Thailand and one member of the SLUSE Advisory Board. He said that *"the price of fertilizer is becoming an extreme and irritating issue to the rural poor crop growers in Thailand"*.

As a result, application of the recommended amount of fertilizer will be either minimized or totally abandoned particularly by the poor farmers. Likewise, the questionnaire survey has revealed that only 5,1% use fertilizer while 43,6% of the villagers do not use fertilizer at all as they can not afford it. Giving up the use of chemical fertilizer increases the agricultural insecurity through crop failure. Among the interviewed farmers, one of the cassava producers has never applied any fertilizer and therefore his yield was significantly low (see table in the appendix).

Occasional flooding caused by deforestation considerably reduces the size of arable land for crop production. Some of the interviewed villagers talked about flooding as restricting the amount of their yield because they can only use a small area for crop cultivation.

Many interviewed farmers who failed in agriculture due to the above described factors tended to switch from agriculture to salaried jobs in town or at least try to send their children to town as they then would be able to send remittances back to their families as they get employed.

Also, as stated in focus group discussion on poverty, some of the landowners in the village prefer to rent their land to others and cash the monthly rent instead of losing the yield.

The interrelated environmental risks (deforestation, drought, flooding, soil erosion and low soil quality) discussed above are the central predicaments of agricultural insecurity which presently is worsening and shaking most of the villagers' welfare. However, some of the farmers in the village struggle to cope with these problems. In the preceding chapters, we will show how environmental risks and agricultural insecurity have an impact on debt, social factors and ultimately on poverty.

### **3.2 Definition of Poverty:**

To understand the poverty situation it is necessary to define this broad concept. The United Nation's definition of extreme poverty is based on the amount of money one has, being people who lives for less than 2\$ a day (UN Works). Additionally, the UN raise the awareness that poverty is a state including several factors. They describe poverty as "*a human condition characterized by the sustained or chronic deprivation of the resources, capabilities, choices, security and power necessary for the enjoyment of an adequate standard of living and other civil, cultural, economic, political and social rights*" (UN 2001). Even though this is an unquestionable definition we feel that an understanding of poverty demands an inside view and a definition from the people who it concerns.

We found it important to apply a holistic approach using the villagers *own* definition of poverty as the defining factor. The resources, choices, security and power as mentioned in the UN definition must be explained in depth. This way we avoid implementing a too general definition of poverty that the villagers might not be able to identify themselves with. Furthermore, we find it more legitimate to draw conclusions about the poverty situation based on peoples own perceptions of their lives since they are the ones actually living under these circumstances.

Through a wealth-ranking PRA exercise 9 villagers were asked to define the wealth categories in the village as well as the criteria attached to the categories. Furthermore, the villagers were asked to attach each category to the houses on a village map in order for us to know who and how many people fitted into the categories (see fig.6):

Sufficient/Rich	Medium	Poor
<ul style="list-style-type: none"> <li>• Own land</li> <li>• Own tractor</li> <li>• Have car</li> <li>• Have Motorbike</li> <li>• Permanent strong, good house</li> <li>• Have a lot of money to put aside for savings</li> <li>• Children get education</li> <li>• Have production to sell by themselves</li> <li>• May have debts, but make enough money to cover it</li> <li>• Income, more than expenditure</li> </ul>	<ul style="list-style-type: none"> <li>• Have own land, but not much</li> <li>• Have enough food</li> <li>• Little amount of money to put aside for savings</li> <li>• Borrow money to invest</li> <li>• Children get education</li> <li>• More permanent and strong house than poor people</li> <li>• Investor buys production</li> <li>• Have motorbike</li> <li>• Some have car</li> </ul>	<ul style="list-style-type: none"> <li>• No land</li> <li>• House of bad quality - not permanent</li> <li>• Day by day labour</li> <li>• Rent land</li> <li>• Debt all the time</li> <li>• No education for children</li> <li>• No credit</li> <li>• No cattle</li> <li>• Expenditure, more than income</li> </ul>

Well-being criterias

Fig 6

As shown in the wealth-ranking, the categories defined by the villagers are sufficient/rich, medium and poor. There are 11 people defined as poor in the village, 27 defined as medium and 7 as rich. The criteria were not based on income as such, but rather on the things you can afford, have invested in or have managed to achieve such as education, debt and landownership. The last one is major in separating the rich from the poor because this was a sign of independency and that people can afford to invest in their land. To be defined as “rich” they had to be landowners (this means owning land with SPK4-01), not be troubled by a lot of debt and be able to afford education for their children. The poor were defined as landless or owning a very little amount of land and usually they were in a lot of debt. Other criteria mentioned were education, the size of the house or owning a car. Summing up the factors separating the rich from the poor, the poverty was a matter of not being self-sufficient and only living on a day by day basis. Many of the villagers told us through semi-structured interviews that poverty is basically when their

expenditures are higher than their income making them unable to invest in the future of their families.

### **3.3 Land Tenure:**

#### **3.3.1 The Land Tenure System in Thailand:**

Having access to land in the rural communities in Thailand is essential when it comes to security in income as well as family safety nets. Land is fundamental to the well being and livelihoods of people in the rural communities, because it ensures income generation for the current generations as well as for the future generations (Leonard et al. 2006). The SPK4-01 is the most secure land holding (ALRO) because it gives the owner official rights to his land, gives better advantages when it comes to taking loans and it cannot be sold to others legally, but only transferred through inheritance. This means that a person holding land with SPK4-01 should not be able to lose his land. The PBT-5 is the less secure of the two because it is only an official tax receipt that gives the owner the right to use a certain amount of land and it is emitted by DLA. This is just temporal and can be taken away from you if you fail to pay the tax (Duangpatra 2008).

As mentioned, the land tenure system in Thailand is quite complex and is characterized by the fact that theory and praxis do not always correlate. In 1984 all people holding land and people employed on land were given official ownership with the SPK4-01. It was done because the land up until this period had been public and mostly was held with a less secure document or not held with any title at all. The titling program was supposed to lead to better production, create security and improve the opportunities to invest in land and thereby alleviate poverty in the long term (Bowman 2004). While the purpose of the SPK4-01 was to ensure security through landownership for the poor, many people have found themselves forced to sell their land illegally because of debt.

### 3.3.2 Landownership

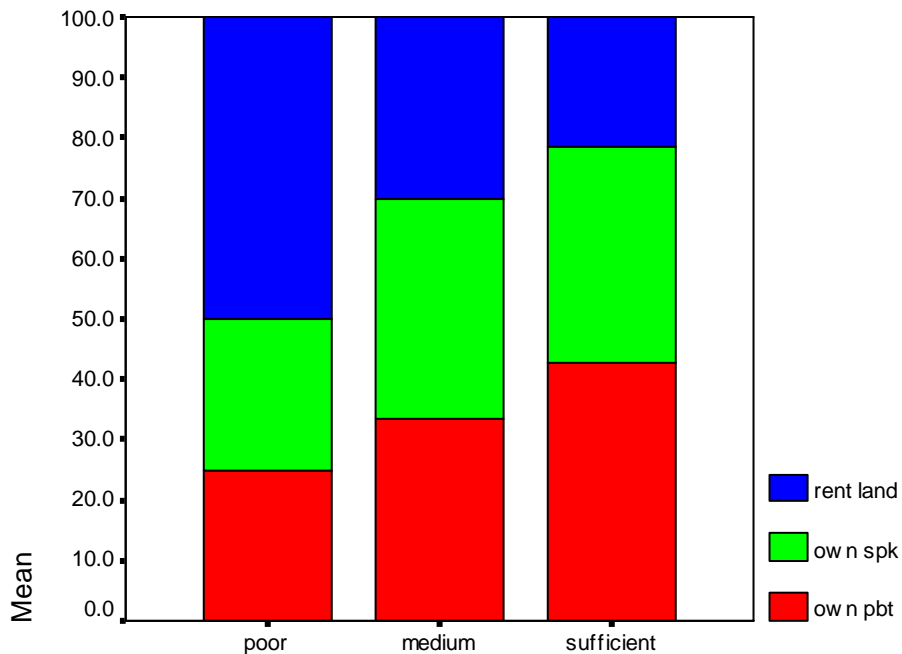


Fig.7 Landownership and wealth

The graph has been tested significant with the Mann-Whitney ( $P < 0.05$ ) and shows the clear correlation between the wealth status of the villagers and the most common way of landholding within each group. In average, there are more land renters within the poor and more land owners within the rich. This fact confirms the statements from villagers and the wealth-ranking which show that landownership is one of the fundamental factors to the economy and the well-being of the people. As we were told in interviews, this was partly because of the lack of security that the poor people experience as will be explained in the following.

### 3.3.3 Insecurity in landownership:

As mentioned in the article “Land Tenure Issues in Economic Development”, the lack of security in land leads to less investment both from the owners and from outside investors (Dale 1997). Feder et. al. claim that insecurity in landownership often causes uncertainty concerning the outcome of investments in things such as inputs and equipment and most often it diminishes the incentives to invest. The consequences of this are lower capital caused by low productivity which in the end inhibits the farmer to invest and instead prefers only living by current consumption (Feder et. al. 1988). Lack of investments seemed also to be the case in Ban Khlong

Bong Phattana, but the incentives to invest did not seem to be lacking. Many of the villagers expressed an urge to invest in their land, but did not have the money for it and often felt that they were bound to the middleman. In this sense Feder et. al make a point, because in Ban Khlong Bong Phattana, the landless who rent land from middlemen do not feel a strong need to invest if they cannot invest properly due to lack of capital.

Renting land as many of the poor do, most often locks them to a middleman who can decide how they should pay the rent. Mrs. Upin, a village woman classified as poor (see wealth ranking) informed us that the feeling of insecurity is rooted in the dependence on the middleman from whom she rents land.

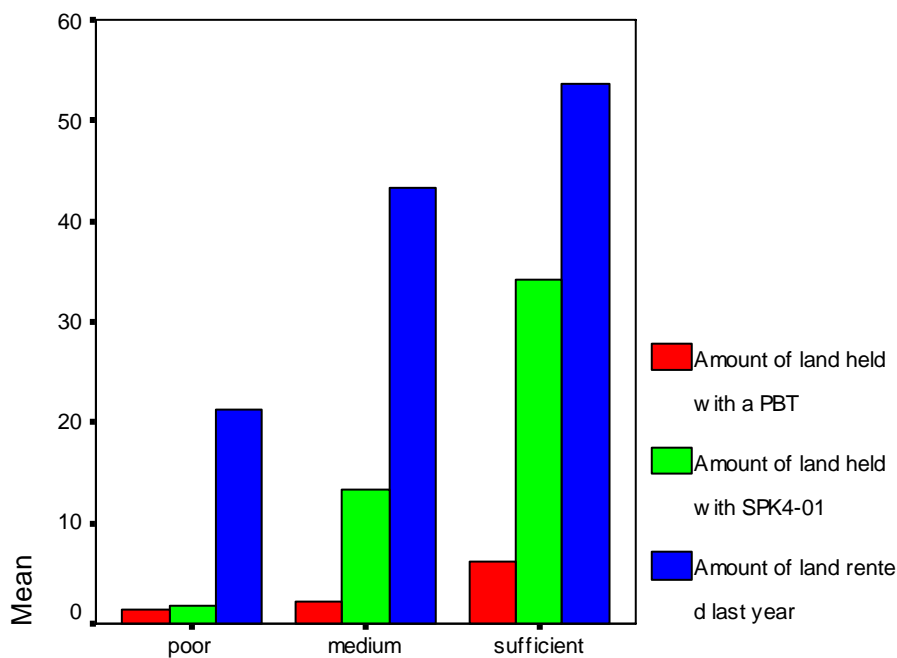


Fig. 8 Amount of land held and wealth

Not only were there less poor people owning land with the SPK4-01, but they also own a significantly less amount of land (T-test:  $P < 0.05$ ). As shown in the graph, the poor villagers rent far more land than they own whereas the sufficient/rich own and rent an almost equal amount of land and they own more than 15 times as much land as the poor. This is also an indicator of the wealthy people being able to create growth and sustainable farming. At least they have acquired more land which they might have bought or they have managed to maintain sustainability so that

they did not have to sell any of their land as the poor. Even though more poor people in average rent land, they have a less amount of land than the rich. As explained in the Thailand Northeast Economic Development Report

*“Lack of income and high income volatility prevents farmers from increasing the size of landholdings via renting”* (Thailand Northeast Economic Development Report 2005).

Thus, the land size is fundamental to the possibilities of increasing income and creating growth. As Alain Janvry writes, it has been observed that landowners with a little amount of land sometimes have a lower income than landless who do off-farm work. Access to land therefore might not be the only criteria for getting out of poverty if the land can not be made profitable (Janvry 2001). The poor are prevented from creating growth as they have no other choice but to rent land and the dependency on the middlemen makes it difficult to increase their income and thereby rent more land.

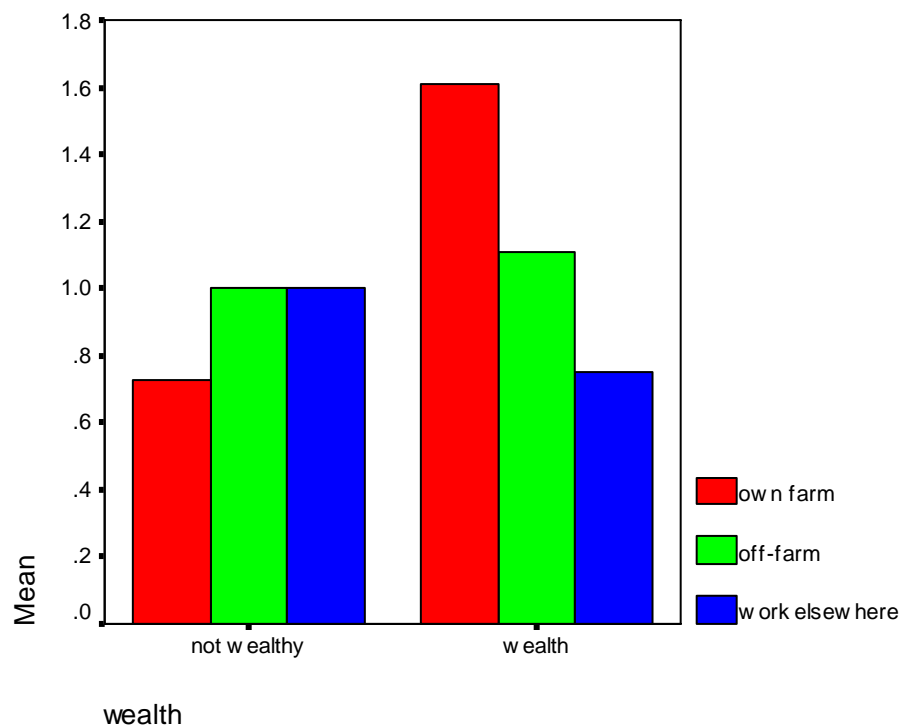


Fig. 9) Relation between wealth and work

The graph above shows the difference between the wealthy and the poor people as far as the time spent on-farm, off-farm and elsewhere (outside the village). It should be mentioned that the category “wealth” includes “medium” and “sufficient” respondents from the questionnaires and it was significant (Mann Whitney test, P value < 0.05) for own-farm and elsewhere work, but not for off-farm work.

Even though the graph is not significant for the not wealthy, we can notice that a majority of the wealthy people from Ban Khlong Bong Phattana work on their own farms and if we include just the bar showing the not wealthy working on own farm, this shows that a minority of them work on their own farms. This fact has a direct effect on their income. The more they work their own land, the higher yield they get and the more they can sell on the market. For poor villagers it is just the opposite: they do not work or work very little on their own land, either because they do not have any or because time and money constrain them. These are all reasons why the poor are compelled to look for supplementary sources of income and therefore work on somebody else’s land or outside the village.

This is the situation for many people in Northeast Thailand and often the off-farm work only leaves “little or nothing [...] left over from the daily labor after the most urgent food and consumption needs are covered” (Thailand Northeast Economic Development Report 2005).

Through semi-structured interviews and follow up questions to the questionnaires we found out that the villagers holding land with the SPK4-01 had more advantages due to independence and goodwill with the banks. They often expressed that they felt more secure and could take more loans. This way some of them had also invested in tractors and could afford fertilizer making their productivity higher. An example of the positive consequences of landownership is Mrs. Somsri who acquired land through marriage. This has meant a somewhat stable economy where the family can sell all of their yields to the official market price without being dependant on a middleman. Furthermore they make enough money to send their oldest daughter to university, a livelihood strategy that could create an even brighter future if the daughter finds a good job in a bigger city and can send remittances back to the family.

As explained, land ownership is fundamental to the livelihoods of the villagers. It is one of the determining factors separating the rich from the poor and has great consequences to the



possibilities of the villagers in shaping their own lives as far as self-sufficiency and independency goes. However, landownership is not a guarantee to the well being of the villagers. It is also related to the environmental risks (deforestation, drought, soil erosion, flooding and bad soil quality), as well as agricultural insecurity. We are aware that even landowners must cope with the environmental risks which often are unforeseen. This can also create insecurity as what happened to a landowning villager who, due to flood, lost 1/3 of his land.

Still, landlessness creates insecurity and diminishes the incentives to invest and also the possibilities of growth in productivity. The land ownership situation is thus tightly linked to the economical situation of the villagers and the debt which will be explained in the following section.

### **3.4 Debt and economics**

In this chapter, we will refer to debt as an indicator of poverty and as a way of explaining it.

Debt consists of loans, and in our area of study loans are related with land insecurity, wealth status and agricultural insecurity, all these factors being ultimately related to poverty. The relation between debt and land insecurity is reciprocal. Borrowers that cannot cover their loans have to give away their land to the lenders, this way becoming landless. The other way around is that landless villagers are the ones that need to borrow money, because they do not own land from which they could obtain any income from. The problem is they cannot borrow money from the bank, the main condition in order to receive the loan being landownership and they have to borrow from local merchants for higher interest compared to the one they would pay for a bank loan.

Regarding relation of loans with wealth status, it is interesting to see from the SPSS analysis that the total loan of the wealthy villagers is twice as much as for poor, but when we calculated the total loan ratio per rai, it came out just the opposite: the loans of the poor are much higher.

wealth status	TOTALOAN	RATIO
poor	Mean 67272.727	19128.233
	3	3
	N 11	10
medium	Std. Deviation 190574.96	55159.539
	74	7
	Mean 58404.809	5994.5565
sufficient	5	
	N 21	21
	Std. Deviation 114320.09	17512.013
Total	73	5
	Mean 133928.57	705.3994
	14	
	N 7	7
	Std. Deviation 217139.82	763.0637
	22	
	Mean 74461.564	8476.4688
	1	
	N 39	38
	Std. Deviation 157129.26	30846.947
	65	6

Fig. 10) Wealth and loans in total and per rai.

The rational behind this relations is the division between the total amount borrowed and the size of the area owned by each category, which in the case of sufficient villagers can be very large, while when it comes to the poor the size of land is small or non-existing. The poor are thus more in debt in relative terms even though it appears the opposite, as they have less debt in absolute terms. These two relations show the distinction between the poor and the better off as far as their income. The better off can obtain more output from their land due to the fact they have a larger cultivated area than the poor and therefore can get more income. Even though the poor borrow a less amount of money, they might not have sufficient land and hence outputs to invest the loans and profit from them. This could be an indicator of the poor not investing their money or simply investing it badly. A sign of the tendencies concerning the use of money was explained to us by the village headman. It is simply necessary to own motorcycles or cars because the village is so isolated and the only way to the market is by these vehicles. Even the poorest in the village own a motorcycle, as he stated.

When related to agricultural insecurity, debt is defined as borrowing inputs from local merchants and further on, we will explain why this happens. As depicted in the chapter about environmental

risks, drought, soil erosion and flood lead to low crop productivity in this village, making it difficult for the farmers to rely on any outcome of their field at the end of the season. The direct impact of losing the yield is low income, as the farmer will have little or nothing to sell on the market. Therefore, in order to make sure they will obtain output from their land, the villagers have to invest in inputs, but as it was described earlier, there is currently little accessibility for inputs because of their high costs. Thus, the only alternative for those who cannot afford inputs (seeds, fertilizer and fuel) is to borrow them from local merchants. How do they cover these loans? After they harvest, they have to sell their yield to the lender, who will keep the amount of money that covers the value of the borrowed inputs, and little money will be returned to the farmers. Wealthy people, on the other hand, do not have this problem, because they can afford the necessary inputs for their crops.

By cumulating the high cost of inputs and rent with landownership, we found out that it is easier for landowners to deal with agricultural insecurity. This is because they can spend a bigger amount of money on inputs in order to maintain or increase their yield compared to the landless villagers who rent land from others and have to pay the monthly rent on top of the money needed for inputs. As a consequence, the ones who rent land invest less in inputs and at the end of the season will have a low yield and a low income. We have compared in the table below the expenditures on inputs and rent with the revenues from selling crops of landowners and renters. What came out is that the net profit of landowners is bigger than the one of the renters, because they do not have to pay rent for land, investing all the money in inputs. We need to specify that the figures from the column “expenditures” include the rent only for the renter, the figures for the landowners including only the cost of inputs.

Number	Landowner/Renter	Expenditures (inputs+rent)	Income from selling yield	Profit (expenditures-income)
1.	Renter	437.600	560.000	122.400
2.	Owner	163.975	403.200	239.225
3.	owner	55.953	521.700	465.747

Tabel no. 2) Comparison of land owner and renters regarding profit

As a summary of the above mentioned correlations, we present below a self-explanatory diagram.

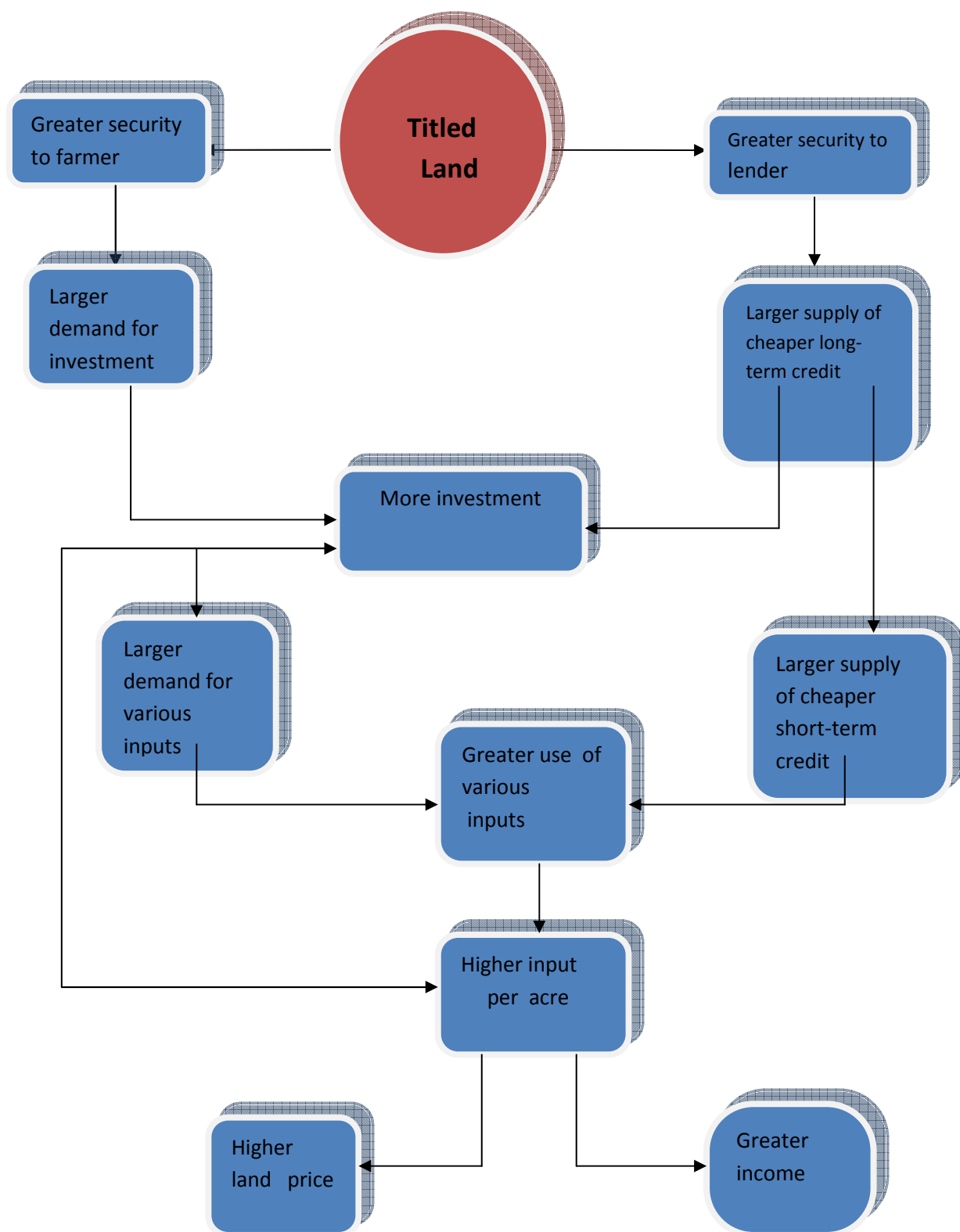


Fig.11) Security of Landownership and farm productivity (Source: Feder et al. 1988).

The above chart illustrates how land security prevents agricultural insecurity by increased investments in inputs on the one hand and financial security by giving you the right to take loans

on the other hand. Both enhance the income, because of increased amount of inputs used for crop production.

In this chapter we tried to show to the reader that debt, landownership, agricultural insecurity and poverty are interdependent in a complex way: the poor borrow money, but can also lose their land because of it. The poor villagers are moreover the ones who do not have land and have to rent land. In order to obtain yield from that land, they need inputs due to high environmental risks. Most likely they cannot afford the inputs because of the high costs, a reason why they have to borrow it from local merchants, this way gaining hardly anything from the yield. All these expenditures keep the poor villagers in a stagnant condition of poverty with few alternatives.

## **3.5 Social Factors and Strategies**

### **3.5.1 Education:**

We found it essential to look at education as this human capital is tightly related to the social resources of the villagers and income enhancing possibilities through employment (Van der Berg 2002). Poverty is not only a matter of low income, but is also manifested through powerlessness and social exclusion, both consequences of the lack of education among other things. Lack of education can lead to social exclusion as illiterate people find themselves unable to participate in society by working and furthermore they are excluded from institutional decision making (Green 2006).

Through the questionnaires we acquired information about the highest level of education within each household mainly to investigate whether or not the education level correlated with the wealth status provided to us through the wealth-ranking. This correlation is shown in the following graph.

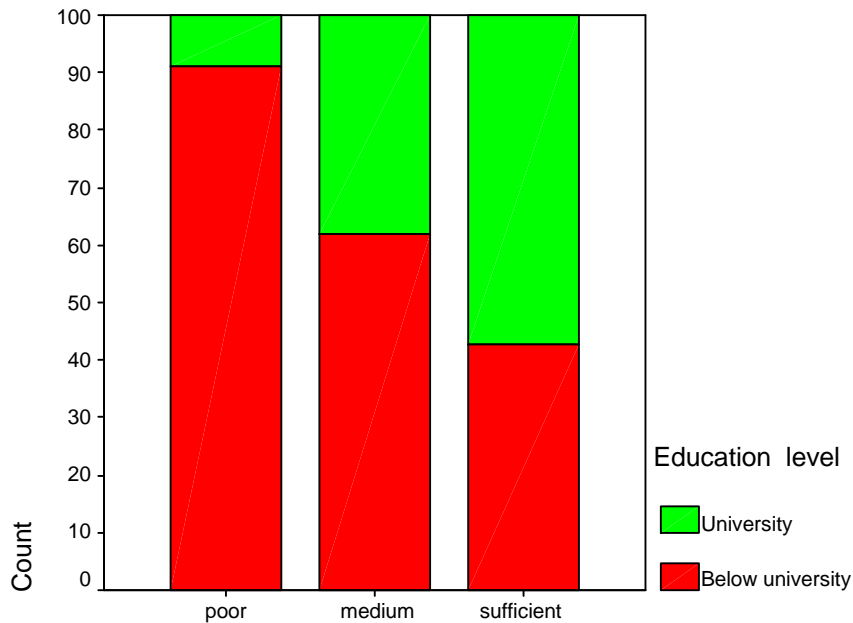


Fig. 12) Education level and wealth

We mention that within the category “below university” we merged illiterate, primary, secondary, high school.

It became evident as shown in the graph above, that the medium and the sufficient made up the majority of the villagers actually affording university level of education and that within the poor only a few had afforded to send a family member to the university.

Not only through the wealth ranking, but also in the interviews it became clear that education is seen as an essential factor when it comes to securing your future. Several of the villagers expressed a wish to invest in their children’s future by giving them the highest education level possible. They explained that this would be a way of securing not only their children’s future, but also a possibility of bettering their own lives if the children could get good jobs in the cities they would be able to send back remittances to the family and support their parents when they no longer can work on the fields.

This tendency towards education as a way out of poverty and hence migration became clear as we discovered that almost 20 of the households in the village were not inhabited due to migration. The headman informed us that some of the villagers from the empty households come back 3 months a year to take care of their fields in the farming season, but that several lived

permanently in the cities. The migration seems to be an important strategy out of poverty, but it also raises the question whether labored work in the cities is becoming a replacement for agriculture? As a poor village woman expressed, agriculture was certainly not the way of improving her livelihood. We also experienced that both rich and poor attempted to prioritize education and thus the possibility of getting good work in the cities as the first and most essential way of getting out of poverty. An example of this is Mr. Swai Sukthong, a 57 year old poor farmer whose three sons are now attending school (two in high school and one in primary school). The cost of the education is sponsored partly by the Catholic Christian Aid NGO and the incomes from his other son's part time work. Though, this attitude towards education as a strategy out of poverty could also enhance the social capital of the people as one poor village woman expressed. Mrs. Upin mentioned that education is a way of empowering people as it would give them knowledge and skills to "fight" the middlemen legitimately. It would also make it easier to organize themselves in order to raise awareness of the poverty to the government.

### **3.5.2 Tendencies of Collaboration and Migration:**

Michael Parnwell writes that power shifts in Thailand, marketization and modernity have had a great impact on the social cohesiveness in villages in the north eastern Thailand. The reasons are the high dependence on the market, bad environmental conditions worsening the outputs and the growth of poverty in the rural areas. These factors have led to migration and hence split up families and communities that in the past functioned as collateral units helping each other out during bad times. The poverty makes people live on a day to day basis concentrating on own basic needs before the needs of the neighbour (Parnwell 2005). In Ban Khlong Bong Phattana the lack of collaboration as far as helping out with work and sharing resources was also a fact mainly because of the lack of resources and a sharp division between the extremely rich and the poor. The villagers mainly took care of their farms in the families or were out looking for jobs in the cities.

When we arrived in the village we did not observe any specific social structure, but it later turned out that the things we could not observe were partly caused by a division between the villagers because the few extremely rich villagers refused to participate in our research and did not want to speak with us. We therefore never met with these villagers and did not see them participate in the few social gatherings taking place in the village while we were there. The division between the



rich and the poor villagers became even clearer through an interview with one of the poorest women in the village. She informed us that all the villagers except for the really rich ones exchange fruits and vegetables when needed. This is possible because most of the villagers own home gardens where they grow fruit trees and vegetables for own consumption, and the reciprocal exchange makes sure that most villagers get a varied selection of food. This example shows that in spite of the lack of capital resources collaboration is not completely missing in the village, but only the poorest share the few assets they have left over. The rich do not participate. The interviewed woman explained to us that the poor did not wish to include them in the reciprocal relationship because the rich did not wish to share their wealth and therefore did not deserve to be part of this. This is one of the strategies used to cope with poverty, a consequence of the poverty and the division between the resources of rich and poor. It appears that a sort of connectedness is felt within the poor and the medium that motivate them to share whatever little amount of food they have.

## **4. Discussion:**

### **4.1 Livelihood Assets - Interrelatedness:**

The main factors defining the poverty situation were defined by the villagers themselves as being, landlessness, debt and lack of education. Additionally, we found migration to be a significant consequence of poverty as well as the outside environmental constraints and the consequences of these were linked to all of the above mentioned factors. We found in the village that these factors are far from independent from one another. On the contrary, they are highly interrelated and make the study of poverty quite complex. We will now discuss the relation between these factors and the way of viewing poverty in the village.

The different factors can be explained through the livelihood assets which are classified as natural, physical, financial and social capital.

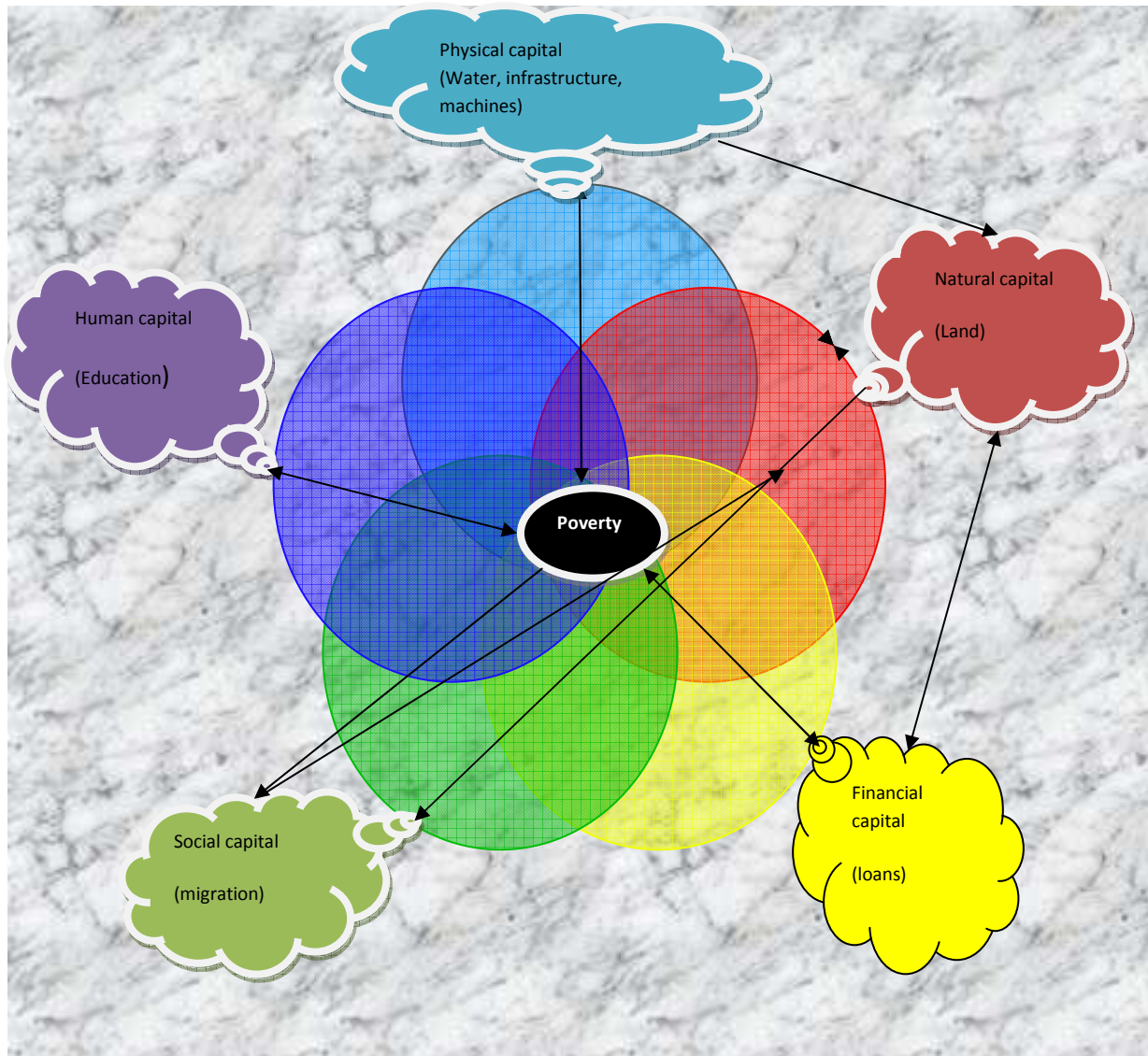


Fig 13) Livelihood assets interdependence

In Ban Khlong Bong Phattana, education, as a part of human capital, strongly relates to the financial capital. Due to the costs of education, especially a high education level, poor people do not afford to send their children in town to the university. People see education as an escape from poverty, imagining that being better education can give better jobs and give them skills to take better care of their land and their families.

Without education it is difficult to achieve a good income. Lack of education can thus be reproducing poverty and vice versa.

Land, as a single component of natural capital in the area of study, is at the same time in a straight forward relation with financial capital. In order to receive loans from the bank, the borrower must be a land owner. On the other hand, the ones who do not own land must borrow money from local merchants and if they do not pay it back, they have to sell their land to the lender. All in all, the lack of money means no investment in land, and no investment in land means less income. There is also a link between natural capital and physical capital in the case of Ban Khlong Bong Phattana in the sense that agricultural machines are used to work the land, means of transport to take the yield to the market.

Physical capital (agricultural machines, infrastructure, means of transport, water) is linked with natural capital as described above and moreover with the financial capital of the villagers, because many villagers use the money from loans to buy motorcycles or even cars. Means of transport are present in every household in order to access the market to buy inputs, sell outputs or look for off-farm work. A special correlation between physical capital and financial capital refers to inaccessibility of the water from the existent ponds due to high price of pumping it out. As a result, the majority of the villagers cannot afford to irrigate their land, which reflects on low crop productivity and on their income in general. An important role plays infrastructure in the livelihood assets, because a good infrastructure makes possible the access to market and to town.

Financial capital has as important components loans as they are can help secure a farmer's future or lead him into more poverty. This all depends on the natural and physical capital, as these influence the possibilities of investing their loans.

Social capital is represented in our village through by social relations and migration. The social relations reflect all of the capitals as they are consequences of the wealth division caused by the above mentioned factors. Furthermore it might intensify the social status and the poverty of the villagers as they choose to collaborate only among themselves. Migration is a result of landlessness or failure in agriculture due to expenses needed, both meaning insecurity of livelihood. Villagers think that if they have a permanent job, they will feel more secure than doing farming.

It is a difficult process understanding the link between the factors and the discussion has shown how a logical order in the relationship between the factors cannot be accounted for. Most of the factors are thus both causes and effects of poverty. Therefore the order in which we have presented our results should not be seen as an indicator of a sequential logic between the factors one leading to the other. Besides from the livelihood assets discussed above and how they interrelate we wish to look further into some of the consequences and likewise reproducing factors of poverty in the village. This will be done through a discussion of the strategies used for coping with poverty.

#### **4.2 Livelihood Strategies – Coping With Poverty:**

Poverty is often presented as a state in which people are just passive victims of governmental policies or economic circumstances, unable to do much about their situation. A closer look into coping or livelihood strategies points towards another way of viewing poor people, namely as active agents who are able to deal with poverty in certain ways. As soon as coping strategies are observed we must accept that people, through own action have an ability to affect their lives. The outcome of the action might not always be positive, but the point made here is that poverty does not determine the lives of the poor. Snel et. al. explain how a distinction between survival strategies and social mobility strategies must be made as the outcome most often is quite different. Survival strategies only take into account the current needs, to make ends meet so to speak, whereas social mobility strategies are attempts to ensure a better future for example through education (Snel et al. 2001). We will here discuss both types of strategies in the case of Ban Khlong Bong Phattana.

In the village we accounted for the fact that people are highly affected by the poverty, but we also witnessed and heard of several strategies for coping with the situation. Education might be seen as one of the better ones as it can create long term security and is not just an alternative with current results. As mentioned some of the villagers, both poor and rich have invested in their children's future by sending them to school. This is also a way of securing the future of the entire family as remittances can be sent home to the family and preceding generations will be more likely to get education as well. This strategy though requires certain resources money is a necessity to carry it out.

The reciprocal exchange of food between all of the villagers except for the really rich ones is an example of both a survival strategy and a social mobility strategy. In it self will not improve the future for anyone, but only covers the basic needs of the villagers, but it also ensures that people, if they continue to exchange food, will not lack food. Snel et al. explain that reciprocal relationships in informal social networks, as we have seen between the poor in the village, are very important for the poor to make ends meet. Though, it is also often seen that the groups with a lower socioeconomic status are part of smaller social networks than the ones with a higher socioeconomic status (ibid. 2001). This could be related to education, as the rich with higher education are more integrated in the urban societies and have better possibilities of expanding their networks. The limitation in having small social networks could also prevent the poor from getting any further than where they are presently as they do not expand their relations.

The debt or simply just the lack of money cause people to turn to immediate survival strategies such as selling their land. As we mentioned earlier, landlessness creates greater land insecurity and can diminish the chances of growth and profit. Thus this livelihood strategy is not secure on a long term basis, but often only leads people into more debt and forced to look for other survival strategies. This situation was quite common in the village and the lack of resources and capital has made many people work in the cities while living in the village or migrate completely and look for other opportunities than farming. Even the poor villagers are taking action to escape poverty through education, but this implies, in most of the cases, that the children would have to leave agriculture as the good money is made in the cities.

All the strategies are related to the different constraints and differ as they also depend on the situations of the families and the resources available. But common for them all is that they demonstrate the action that the villagers take in order to improve their situation. Weather or not they are successful is not relevant, but the fact that the different strategies are products of the factors related to poverty as we have accounted for and the fact that the strategies all either cause, are being caused or both by poverty, helps us understand the effect of poverty in this specific village.

## 5. Conclusion:

We will in the conclusion not try to suggest which factors related to poverty are the most important ones in Ban Khlong Bong Phattana. Agricultural insecurity, landlessness, debt and low level of education are all determinants of one another. Agricultural insecurity as we explained walks hand in hand with environmental risks, lack of income and low investments. Even though the causes and consequences of poverty are interrelated and create an almost static state of poverty, we found that certain livelihood strategies are being used deliberately to escape or change their current situation. We accounted for both survival strategies and social mobility strategies as they were directly linked to the poverty in Ban Khlong Bong Phattana. They were moreover used differently and had different implications on the lives of the villagers. A high awareness of the necessary means was clear as for example the importance of education as an investment in social assets instead of physical. A strategy that seems more secure than investing in agriculture. The immediate survival strategies were often seen where only current needs would be covered such as through selling land, but this would often maintain the poverty or even worsen it. We hope that by approaching poverty from a holistic angle and showing the complexity of the concept we have at least come closer to an understanding of poverty, not as a general concept, but as linked to the village and the villagers within it.

## 6. Perspectives:

As the purpose of this report has been to assess for poverty, or to understand poverty in Ban Khlong Bong Phattana, we are also aware that we make poverty the “object” of our attention. Maia Green writes that this “*abstracts poverty from people and obscures the social processes that make certain people subject to its effects*” (Green 2006). Still we feel that by including both rich and poor we investigate poverty from several perspectives. All social processes are naturally not included, but we feel that by looking into the ways people cope with poverty we attempt to give a picture of the social aspects related to the poverty. Furthermore the approach of looking for specific factor and indicators to understand poverty can give the idea that we try to find some common factors explaining poverty in general. This is not the idea, even though we solely by measuring poverty and looking for the poor send the message that poverty is defined in a certain

way. We are therefore aware that other factors could have been explored and that we, by looking only at poverty might have overseen some factors. However we find it an advantage having used the villagers own definition of poverty as this has prevented us from discursively representing poverty using predetermined definitions.

## **7. Acknowledgements**

First we would like to thank the village members as this research would not have been the same without their support and collaboration. Especially we owe our 3 key informants a thanks for giving us their priceless time and hospitality to gather all the information we have required.

Secondly we would like to thank our Thai counterparts for their earnest participation in our fieldwork and for easing the facilitation of the field activities that have made this project become more feasible and practical.

We owe our interpreters a great thanks as they were always cheerful and helpful sacrificing their spare time whenever necessary. Hence, we forward our sincere appreciation to them.

We also feel grateful to Quentin Gausset, Morten Christiansen, Professor Pya and Dr. Puntip, staff of the University of Copenhagen, Denmark and Kasesart University, Thailand for their academic advice and guidance whenever it was needed.

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## **9. Appendices**

### **Appendice 1- Synopsis**

# **Interdisciplinary Land Use and Natural Resources Management (ILUNRM/SLUSE)**

## **Understanding poverty in Ban Khlong Bong Phattana, Nakhon Ratchasima Province, Thailand**

**Research Synopsis Submitted to the Course Instructors:**

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## **Introduction:**

In Thailand the rural societies are the poorest with little or no land. Furthermore the North eastern region is one of the poorest in Thailand and many places are suffering from soils of poor quality (Leonard and Ayutthaya 2003).

Ban Khlong Bong Phattana, Nakhon Rachasima is situated in the north eastern region of Thailand and the situation of the people is characterised by poverty, unequal distribution of land and debt problems. The government has intended to alleviate poverty by implementing the 1 million baht project where all villages in Thailand have been offered loans, including Ban Khlong Bong Phattana, Nakhon Rachasima with the purpose of improving investment in land, cultivation and crop productivity, but if villagers are not able to pay the money back in time the loan will be obtained from informal moneylenders with higher interests and the debt will be harder to pay off (ibid). People are then often forced to sell their land and the consequences that we know of so far are tendencies to find off-farm work out side the village and/or work for other farmers on their land (Gausset 2006). The environmental deficiencies, problems related to land tenure and the credit system are all factors which supposedly influence and are influenced by the poverty and the thereby related livelihood strategies.

The following research question has been formulated with the intention of capturing the ecological, economical and social factors contributing to peoples' livelihood strategies concerning poverty. The combination of a national implemented land tenure system and the lack of both natural and social resources must be highly influential in the choice or need for specific livelihood strategies and we wish to explore how and why the villagers choose to run their daily lives as they do and what the consequences of their strategies might be.

*Key words: poverty, crop and soil productivity, land tenure, credit, debt, off-farm activities*

## **Main objective:**

To understand the correlation between poverty and livelihood strategies in Ban Khlong Phattana

### **Specific Objectives:**

1. To investigate the livelihood strategies related to crop productivity in the village and how they influence the level of poverty
2. To explore the correlation between land tenure system and livelihood strategies and how it affects poverty in the village
3. To understand the local impacts of credit system on livelihood strategies and vice versa
4. To investigate how poverty affects the social structure and connectedness in the village and vice versa

### **Research Questions:**

- 1.1. What is the level of crop productivity?
- 1.2. How is the situation of soil productivity?
- 1.3. What are the local environmental constraints?
- 1.4. How do villagers deal with low crop and soil productivity?
  
- 2.1. What is the situation of current land ownership in the village?
- 2.2. How do the villagers cope with land division in the area of study?
- 2.3. Who are the most vulnerable as far as land division goes and why?
  
- 3.1. How and why do villagers get access to credit?
- 3.2. How do people use their loans?
- 3.3. What is the impact of credit on debt in the village?

- 4.1. What is the social structure in the village?
- 4.2. What are the social networks in the village and how do they work?
- 4.3. How do off-farm activities affect the social relations among villagers?

## METHODOLOGY

Working questions/issues	Data needed	Methodology	Source of information
<b><i>Crop and soil productivity</i></b>  1.1. How are the levels of crop productivity?  1.2. How is the situation of soil productivity?  1.3. What are the local environmental constraints?  1.4. How do villagers deal with low crop and soil productivity?  Natural capital  Human capital	1.1.a) Size of cultivated area  1.1.b) Cropping systems  1.1.c) Crop productivity/rai  1.1.d) Inputs (type, accessibility, price, amount)  1.2.a) Soil fertility  1.2.b) Soil erosion  1.2.c) soil salinity  1.3.a) drought  1.3.b) rainfall  1.3.c) weeds and pests  1.4.a) strategies for improving crop and soil productivity	Transect walk and GPS measurements (1.1.a, 1.1.b)  Farming calendar (1.1.b, 1.3.a, 1.3.b)  Problem ranking (1.2.a, 1.2.b, 1.3.a, 1.3.b), community mapping (1.1.b, 1.2.b)  Interviews with key informants (1.1.b, 1.2.b, 1.3.a, 1.4.a)  Household questionnaire (1.1.a, 1.1.c, 1.1.d)  Soil sampling and analysis (1.2.a, 1.2.c)  Informal conversation and observation (all)  Meteorological data (1.3.a, 1.3.b.)	Farmers  Headman of the village  Sampled households  Extension officers  Literature

<p><b><i>Land tenure system</i></b></p> <p>2.1. What is the situation of current land ownership in the village?</p> <p>2.2. How do the villagers cope with land division in the area of study?</p> <p>2.3 Who are the most vulnerable as far as land division goes? Why?</p> <p>Physical capital</p> <p>Financial capital</p> <p>Human capital</p> <p>Social capital</p>	<p>2.1.a)type of titles/certificates</p> <p>2.1.b)gender aggregation</p> <p>2.1.c)how much</p> <p>2.1.d)who rents land?</p> <p>2.1.e)who buys land?</p> <p>2.1.f)who sells land?</p> <p>2.1.g) cases of losing land</p> <p>2.2.a)why do people rent land?</p> <p>2.2.b)why do people buy land?</p> <p>2.2.c)why do people sell land?</p> <p>2.2.d)what do the landless people do for living?</p> <p>2.3 a) how much do the renters earn?</p> <p>2.3 b) how much do the sellers earn?</p> <p>2.3 c) how much do the owners earn?</p> <p>2.3 d)gender aggregation</p> <p>2.3 e)education</p> <p>2.3.f)social network</p>	<p>Transect walk and GPS measurements(2.1.c)</p> <p>Problem ranking , (2.1.b,2.1.d, 2.1.f,2.2.a,2.2.c,2.2.d,2.3.d), community mapping (2.1.c,2.1.d,2.1.e,2.1.f)</p> <p>Interviews with key informants (2.1.g,,2.2.a, 2.2.b, 2.2.c, 2.2.d)</p> <p>Household questionnaire (2.1.a, 2.1.b, 2.1.c, 2.1.d, 2.1.e, 2.1.f, 2.2.d)</p> <p>Informal conversation and observation (all)</p> <p>Focus group discussion (2.1.b,2.1.d,2.1.f,2.2.a,2.2.b,2.2.c,2.2.d,2.3.d)</p>	<p>Villagers (land owners, landless, renters, lenders)</p> <p>Sampled households</p> <p>Extension officer</p> <p>Literature</p>
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<p><b><i>Credit</i></b></p> <p>3.1 How and why do villagers get access to credit?</p> <p>3.2 How do people use their loans?</p> <p>3.3 Which is the impact of credit on debt in the village?</p> <p>Financial capital</p>	<p>3.1.a) Rules for getting credit</p> <p>3.1.b) Who gets credit</p> <p>3.2.a) investments</p> <p>3.3.a) who is in debt and why</p> <p>3.3.b) implications of not repaying the loan</p>	<p>Household questionnaire (3.1.a,3.1.b,3.2.a)</p> <p>Interviews with key informants (all)</p> <p>Informal conversation (all)</p>	<p>Villagers</p> <p>Extension officer</p> <p>Literature</p>
<p><b><i>Social relations/networks</i></b></p> <p>4.1. What is the social structure in the village?</p> <p>4.2. What are the social networks in the village and how do they work?</p> <p>4.3. How do off-farm activities affect the social relations among villagers?</p> <p>Social capital</p>	<p>4.1.a)status(age, gender, wealth, education), who lives where</p> <p>4.2.a)organized groups of farmers</p> <p>4.2.b)collaboration among households and reasons for collaboration</p> <p>4.3.a) type of off-farm activities and reason for choice</p> <p>4.3.b)who, how long</p> <p>4.3.c)income from off-farm activities</p> <p>4.3.d)relation of off-farm workers with the rest of the villagers</p>	<p>Household questionnaires (4.1 a, 4.3.a, 4.3.b, 4.3.c.)</p> <p>Interviews with key informants (4.2.a, 4.2.b, 4.3.d.)</p> <p>PRA –wealth ranking( 4.1.a.) , community mapping (4.2.b)</p> <p>Focus group discussion (4.2.a, 4.2.b, 4.3 d.)</p> <p>Informal conversation and observation (all)</p>	<p>Villagers</p> <p>Literature</p>



Transect walk will be used to notice differences among households, the different cropping systems, the infrastructure of the village, to get a rough picture of households assets, the situation of soil erosion.

After we get some information about crops and land tenure from questionnaires, we will do GPS measurements for cross-checking the size of cultivated area and owned land for some of the households randomly sampled.

The farming calendar, a PRA tool based on villagers' participation, will give us useful information about types of crops and systems of cropping, seasonality, rainfall frequency, occurrence of drought, severity of weeds and pests, data needed in order to answer our questions related to crop and soil productivity.

We will use problem ranking, another PRA tool, to find out information about soil fertility (if it is low), soil erosion, occurrence and duration of drought, amount of rainfall, as important constraints of crop and soil productivity. Other type of information that we hope to obtain through this method is gender implication concerning land ownership (only daughters inherit land), why people rent land, why people sell land. At the same time, we intend to use problem ranking to discover reasons for choosing off-farm activities, data which are necessary for investigating the poverty effects on social structure and relations in the village. This tool will help us check if the problems we thought about are real and, at the same time, will allow the villagers to contribute defining the problems they have, because it is based on their own formulations of the problems.

Focus group discussion will be done with maximum 8 villagers. We will concentrate on social relations and networks, off-farm activities, gender aggregation correlated to landownership. The focus group discussion will be used to observe internal relations and interaction that might not be showing in the every day life, and furthermore to get a variety of opinions on certain topics at the same time.

Community mapping In order to obtain first hand information of the area use and information of land tenure and to identify current agricultural problems and relations among households, a group of villagers would be asked to draw a map according to their own perspective of these aspects.

Wealth ranking will be very useful in showing social stratification based on villagers' perceptions about poverty and wellbeing. A range of different levels, from poor to rich, will be defined and explained to the villagers. Afterwards they will be asked to include themselves in one of the categories described.

Interviews with key informants will be carried out to obtain essential information regarding the village and problems we are interested to know about and other related aspects which might come into light. First of all, we will conduct an interview with the headman of the village and later we will choose a few more (around 4) key informants. We also need to have an interview with the extension officer in the area, from which we will get precise information about the extent of soil erosion, soil fertility, crop productivity, inputs, and strategies for improving soil and crop productivity, cases of losing land, reasons for selling, renting land and alternatives for the landless people. We will also get useful clarifying information about the correlation between land ownership, livelihood strategies and its impact on poverty, as well as data about the credit system, its accessibility for villagers and to what extent does this affect debt in the village. Another category of information that we wish to get through this method is about social networks and off-farm activities that some villagers chose to do.

Household questionnaires are meant to supply us with relevant information for all our concerns and can furthermore give us a clue as to which informants we should choose to obtain further information. They will be carried out in all the households (55) from the village if possible, for a complete picture of the area of study. If we realize it will not be possible to cover all the households during our fieldwork, we thought about an alternative: random sampling of 25 households.

Soil sampling and analysis will be relevant for showing the soil fertility. Our first concern will be to carry a pilot sampling from a few different fields and analyze them to see which nutrients are deficient (we intend to look at N,P,K,pH and Na).Afterwards, the sampling will aim land belonging to poor and rich villagers, in order to show the correlation between soil productivity and welfare. The analysis will be done in the field, using the existent soil kits

We already have some meteorological data from Sakaerach Environmental Research Station Nakhorn Ratchasima province (Basic information, 2006) regarding monthly average rainfall and the evaporation amount, but we will try to get more about occurrence of drought when we arrive in Bangkok.

Individual informal conversations is needed, because no appointment is required and in addition we might discover relevant pieces of information that we did not think about or talk about sensitive issues like losing land, debt, income, social differences. It will also allow triangulation of collected data and ensure reliability of information obtained through group activities.

Literature review. We did literature review in Copenhagen, to have a starting point for our assumptions and research questions. This will also help us checking and comparing our findings and methodology with previous research. If there will be time in Bangkok, we will ask our counterparts about relevant literature.

## SAMPLING METHODS:

An appropriate method of sampling for the start of our field work could be non-probability sampling, by interviewing the headman of the village and ask him to advice us how to identify other key informants in the village (snow-ball sampling).

A random sampling of around 25 households will be done, in case we realize we cannot cover all the house holds in the village (55).

## Time schedule

Farming calendar					T										
Activities															
Problem ranking															
Days															
Semi-structured interviews regarding crop and soil productivity	5.03	6.03.	7.03.	8.03.	9.03.	10.03.	11.03.	12.03.	13.03	14.03.	15.03.	16.03.	17.03.	18.03	19.03
Meeting That students and discuss synopsis	all	all													
Pilot survey of the Semi-structured questionnaires and interviews regarding statistical data about land tenure and credit climate			all				T+E	All		T+N					
Community mapping															
Meet the headman and introduce ourselves to the villagers				all				E							
Semi-structured interviews regarding social networks									T+E	T+E					
Transect walk in the village & GPS measurements					N+E										
Follow up interview with headman									N						
Interview with headman of village about crop and soil productivity.					T									All	
Interview with extension officer						N									
Follow up interview regarding land tenure															All
Household and credit questionnaires					N+E	N									
Follow up interview regarding social						E+T							All		
Community history															

networks															
Focus group discussion											All				
Soil sampling and analysis					N						N				
Participant observation with off-farm workers											T	E			
Participant observation with farmers in the field											E	N			
Midterm evaluation								All							
Informal conversation and observation	All	All	All	All	All	All	All	All	All	All	All	All	All	All	All
Analyzing data from the field and comparing it with material from Thai students	All	All	All	All	All	All	All	All	All	All	All	All	All	All	All

**Appendice : List including field activities**

<b>Date</b>	<b>data gathered from</b>	<b>Responsible persons</b>	<b>Remark</b>
8, 9 and 17/3/2008	Three interviews with key informants	Elena, Tina	
9, 10, 11/3/2008	Questionnaire survey with thirty nine farmers	Elena, Tina, Nathnael	
10-11/3/2008	Community history (with nine villagers)	Elena, Tina	
	Community mapping(with 5 villagers)	Elena, Tina	
	Wealth ranking (with nine villagers)	Elena, Tina	
	Problem ranking (with eight villagers)	Elena, Tina	
9&11/3/2008	Ten farmers soil sampling and analysis	Elena, Nathnael	9 <sup>th</sup> -sampling, 11 <sup>th</sup> -soil analysis
10/03/2008	Focus group discussion on poverty (with eight villagers)	Elena, Tina	
13-15,17/3/2008	Six semi- structured interviews	Elena, Tina	
16/3/2008	In-depth (unstructured ) interviews with six cassava and maize growers	Nathnael	
	Informal conversation with one expert, driver and TAO of the village	Elena, Tina, Nathnael	daily

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## Appendix

### **Interview Guide with village head man**

#### **General**

Name of interviewee\_\_\_\_\_

Name of interviewer\_\_\_\_\_

Date and time\_\_\_\_\_

When did you start to head this village?

When and how was the village established?

#### **Crop and soil productivity**

How do you describe crop production of the village in the past and present?

-major crops, why do they cultivate them?

-average crop productivity per rais per year in the past and present, why?

-Subsistence (self consumption) VS commercial (for sale) in the past & present, if there is a change, why?

What are the major crop production constraints/problems happening in the village so far?

When (frequency)?

-drought

-pests (insects, diseases and weeds)

What was the situation of soil in the past compared to the present situation?

#### **Land tenure and demarcation**

How was the land ownership situation in the village in the past?

How does the land ownership situation affect the crop production in the village?



How do people get titles for land? What is the general effect of having land on the livelihood of the villagers?

**Social factors and welfare**

Are there, or has there been any conflicts or disputes in the village?

How did you solve those conflicts in the village?

What are the major social groupings in this village? What are the purposes of the social groupings?

Are there any NGO-activities going on in the village? What are the purposes and effects of the NGO-activities?

What are the off-farm activities in the village? How do the off-farm activities affect the village?

How do you describe the living standard (livelihood level) of this village compared with the neighbouring ones? Is it poor, medium or rich? If this is the case what are your criteria to make such differences among the villages?

Finally, how would you describe the village's potential and constraints (strong and weak side) in general?

## **Interview guide for extension officer**

Name interviewee

Name of interviewer

Date and time

### **Crop productivity:**

Which are the main cropping systems in the village and why?

Which are the inputs the people use and their price?

What is the situation of soil erosion in the village?

How does drought affect the yields?

What are the strategies applied in the village for improving crop and soil productivity?

### **Social:**

What are the organized groupings in the village?

Are there any NGO activities going on in the village? What are they?

### **Credit:**

What are the rules for getting credit?

What happens if people do not pay back their loans in time?

Are there many people that do not pay back their loans in time?

**Questionnaire:**

(The questions in red are added by group 3)

Village:

Number of questionnaire:

Name of informant:

**Household**

Gender of head of household	
Age of head of household	
Education of head of household	
Ethnicity/Language?	
How many adults in the household?	
How many children/minors in the household?	
Year of establishment in the village?	

**Salaried work:**

How many members of the household have salaried employment?	
Type of salaried work	a. off-farm b. on-farm c. mix of both types

**Credit, loans**

	Amount of money	Interest rate
Did you borrow money from a middleman last year (for contract farming)?		
Did you borrow money from a village association last year?		

**Land rights (number of rais owned, rented, sold)**

Amount of land owned with a PBT5 title?	
Amount of land owned with a SPK4-01	
Amount of land rented last year?	
Amount of land “sold” in the past 5 years?	

**Livestock production**

How many heads of cattle do you own?	
How many pigs?	
How much chicken?	
How many sheep?	
How many goats?	
Do you have a fish pond?	

**Agricultural/crop production**

	Production (last year)	Produced mainly for home consumption (H) or for cash (C)?
Maize		
Cassava		
Rice		
Groundnut		
Tomato		
Chili		
Sugar cane		
Soya bean		
Agar wood		
Coconut		
Banana		
Papayas		
Thai apple		
Tamarind		

Leechees		
Longan		
Mango		
Mushrooms		
Rattan		
Bamboo shoots		
Firewood		
Other please specify		

What is the size of the area covered by the three most important crops that you cultivate?

How do you get the seeds for your crops?

How much do the seeds cost?

#### **Agricultural inputs**

How many rais of land did you irrigate last year?	
<p>How much fertilizer did you apply in your fields last year? If none, why?</p> <p>How much does the fertilizer cost?</p>	
How much manure did you apply in your fields last year?	
Did you use tractors or animal traction to farm?	

Are you part of any organized group of villagers? Which one?

## Appendix 2: Activity sheet

Time schedule for Group 3	
8	Planning activities for the 9th Meeting headman, TAO and assistant of headman, village mapping ✓
9	Questionnaires, transect walk, soil sampling (pilot test) Interview headman ✓
10	Questionnaires, focus group discussion... PRA-Community history, Interview with TAO member, Data entering ✓
11	Interview with extension officer, Community history, Forming calendar Problem ranking, wealth ranking, Community mapping
12	Interview with TAO, <del>focus group discussion</del> Mid term evaluation
13	Semi-structured interviews: Crop and soil productivity, land tenure and credit, social networks
14	Participant observation with farmers in the fields
15	Soil sampling (stratified), (Participant observation with farmers in the field)
16	GPS, Follow up interviews
17	Follow up interviews, soil sampling, community meeting
18	GO HOME! 😊

## Appendix 3: Questionnaire

### Questionnaire Survey

Village:

Number of questionnaire:

---

*We are a group of student from University of Copenhagen, Faculty of Life Science, Denmark, studying Agricultural development. We have cooperation with a group of Thai student from Kasetsart University. We kindly ask you to participate in my questionnaire survey. Your answers will be kept anonymous and the results will be used to analyze the coping strategy of the Livelihoods if it is suitable for the village to fill the requirement of our academic study. Thank you for your participation.*

---

#### I. Background information

1.1 Name of informant: .....

1.2 Name of head of household (optional):.....

1.2 Gender of head of household :    Male    ☐ Female    ☐

1.3 Age of head of household    :.....years old

1.4 Highest level of education of any member of household

☐terate    Pri☐ry school    Second☐    High school    ☐niversity    ☐

1.5 How many adults in the household (16 and above)?.....person

1.6 How many children in the household (below 16)?.....person

1.7 What generations live in the household?

☐rand parents    Paren☐Adults    Children☐

1.8 When did you move in the village?.....

#### II. Occupation

How many members of your household work on your own farm or plantation?.	.....person
How many members of the household work in factory, trade, service, tourism, etc.	.....person
How many members of the household work on someone else's farm or plantation?.	.....person

### III. Credit, loans

	Amount of money	Interest rate
Did you borrow money from the bank of agriculture and agricultural cooperative (BAAC) last year (2007)?  Yes <input type="checkbox"/> No <input type="checkbox"/>		
Did you borrow money/inputs from a middleman (from km 79) last year?  Yes <input type="checkbox"/> No <input type="checkbox"/>		
Did you borrow money from the "one million per village" project or from another village fund?  Yes <input type="checkbox"/> No <input type="checkbox"/>		
Did you borrow money from a relative last year?  Yes <input type="checkbox"/> No <input type="checkbox"/>		

### IV. Land rights (number of rais owned, rented, sold)

Amount of land held with a PBT?	.....Rais
Amount of land held with a SPK4-01?	.....Rais
Amount of land rented/borrowed last year?	.....Rais
Amount of land transferred in the past 5 years?	.....Rais
Amount of land acquired in the past 5 years?	.....Rais



## V. Livestock production

How many heads of cattle do you own?	
If you own cattle, is your own land sufficient to graze your cattle?	<input type="checkbox"/> es      No <input type="checkbox"/>
How many pigs?	
How many chickens?	
How many sheep/goat?	
Do you have a fish pond?	<input type="checkbox"/> es      No <input type="checkbox"/>

## VI. Agricultural productions

	How many rais planted last year?	How much (tons/kg) did you get per rai last year?
Maize		
Cassava		
Rice		
Tomato		
Chili		
Sugar cane		
Other:.....		

## VII. Production from trees

	How many Trees (plants) do you have?	Is it mainly for cash or home consumption
Coconut		<input type="checkbox"/> ash      H <input type="checkbox"/> he consumption
Banana		<input type="checkbox"/> ash      H <input type="checkbox"/> he consumption
Papayas		<input type="checkbox"/> ash      H <input type="checkbox"/> he consumption
Agar wood		<input type="checkbox"/> ash      H <input type="checkbox"/> he consumption
Thai apple		<input type="checkbox"/> ash      H <input type="checkbox"/> he consumption
Other: .....		

### VIII. Non Timber Forest Products

	How many days per year do you collect	Do you sell some of this product?
Mushrooms		<input type="checkbox"/> es      No <input type="checkbox"/>
Rattan		<input type="checkbox"/> es      No <input type="checkbox"/>
Bamboo shoots		<input type="checkbox"/> es      No <input type="checkbox"/>
Agar wood seedlings		<input type="checkbox"/> es      No <input type="checkbox"/>
Other: .....		

### IX. Agricultural inputs

How many rais did you irrigate for vegetable production last year?	.....Rais
How much fertilizer did you apply in your fields last year?	.....kg
How much manure did you apply in your fields last year?	.....kg
How did you prepare your field (ploughing) last year?	<input type="checkbox"/> Own tractor <input type="checkbox"/> Rented tractor <input type="checkbox"/> Animal traction

#### **Appendix4: Interviews for key informants**

##### ***General***

Name of interviewee\_\_\_\_\_

Name of interviewer\_\_\_\_\_

Date and time\_\_\_\_\_

When did you start to head this village?

When and how was the village established?

##### ***Crop and soil productivity***

How do you describe crop production of the village in the past and present?

-major crops, why do they cultivate them?

-average crop productivity per rais per year in the past and present, why?

-Subsistence (self consumption) VS commercial (for sale) in the past & present, if there is a change, why?

What are the major crop production constraints/problems happening in the village so far? When (frequency)?

-drought

-pests (insects, diseases and weeds)

What was the situation of soil in the past compared to the present situation?

##### ***Land tenure and demarcation***

How was the land ownership situation in the village in the past?

How does the land ownership situation affect the crop production in the village?

How do people get titles for land? What is the general effect of having land on the livelihood of the villagers?

##### ***Social factors and welfare***

Are there, or has there been any conflicts or disputes in the village?

How did you solve those conflicts in the village?

What are the major social groupings in this village? What are the purposes of the social groupings?

How do you describe the living standard (livelihood level) of this village compared with the neighbouring ones? Is it poor, medium or rich? If this is the case what are your criteria to make such differences among the villages?

Finally, how would you describe the village's potential and constraints (strong and weak side) in general?

## **Appendix 5:** Semi structure interview with villagers

Name

Number of household

### **Topic: poverty**

- Could you first describe your upbringing to me and when and why you moved to this village and started farming/doing agriculture?
- How would you describe a poor person?
- What is the best thing about living in this village?
- What is the worst thing about living in this village?
- Is there a level of poverty that, for you, is acceptable?
- What are for you the major causes of poverty in this village, and in general in Thailand?
- What should be done to change the situation of poverty in your village?
- Who do you feel are responsible for the poverty?
- Do you feel that your future (your life) is secured? – Why? Why not? What does it take to be secure?
- What are the most important things for you in your daily life?
- What are your hopes for your children's future?
- Do you work with any of the other villagers?
- Who do you know the best in the village?
- Do you have any family members or friends working somewhere else who sends you money?

### **Education:**

What is the highest level of education in your household? If university, how do you afford it? Why?

### **Land ownership:**

- What do you feel and what is your opinion about the SPK4-01?
- Have you ever transferred land? If not, do you know any body that did?

### **Debt:**

- Do you have a lot of debt? Why?
- How do you pay off your debts?
- Do you plan on taking more loans? Why?
- How do loans affect your daily life?

### **Crop and soil productivity:**

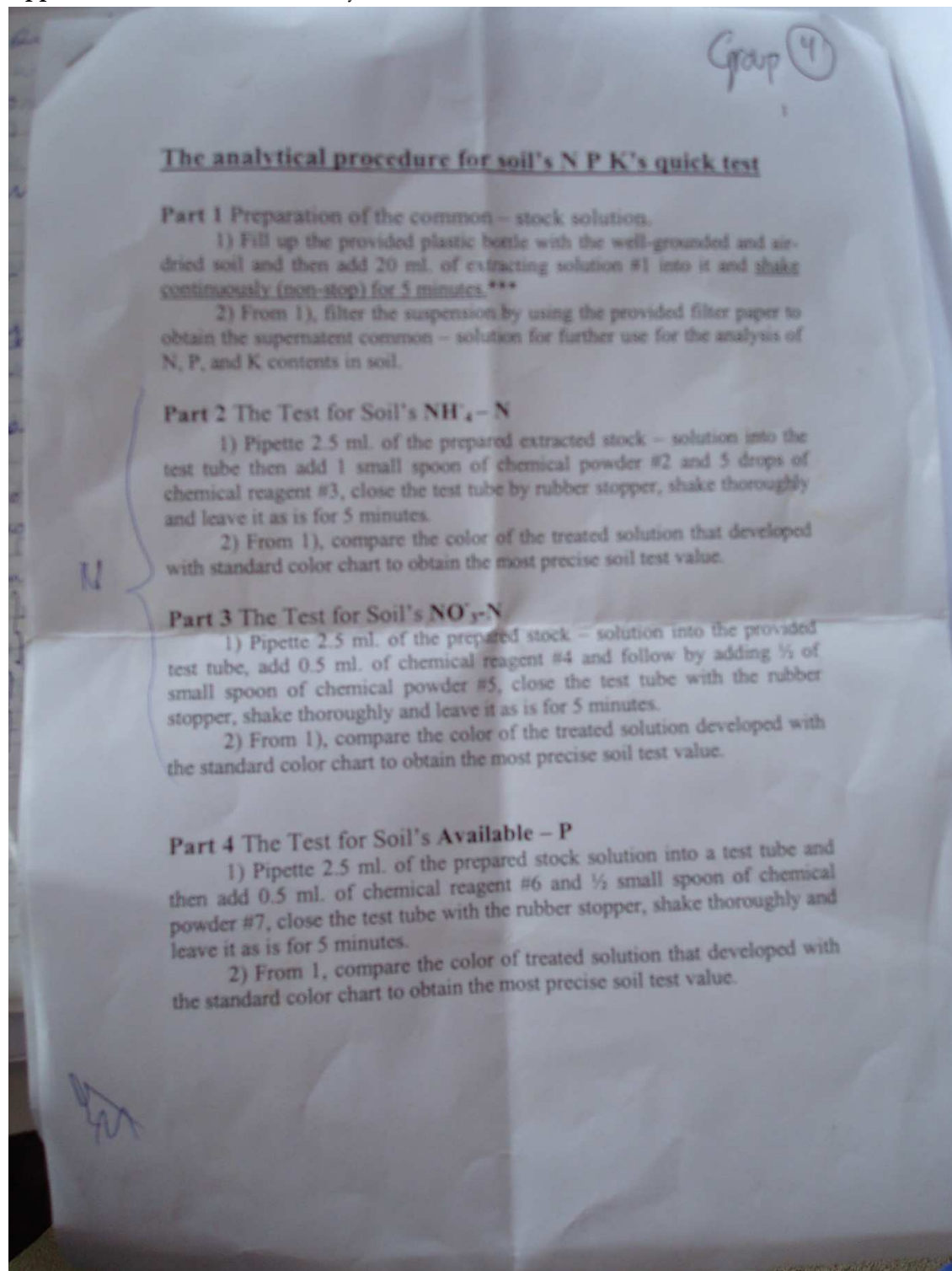
Is there a trend for shifting from agricultural activities to off-farm work? Why?

How is your cropping? Why do you choose this?

Do you believe that the agricultural activities are improving your livelihood? Why, why not?

- Do you know about the Royal Project? If so, how do you feel about it?
- Does religion play a big part in your daily life? How so?

## Appendix 6: Methods of Soil analysis



### Part 5 The Test for Soil's Available – K

Firstly, prepares the color developer solution #9 by adding 3 ml. of distilled water into the chemical powder containing bottle #9 and shake thoroughly for 5 minutes. This prepared solution #9 will be further use for the available – K analysis as follows;

Pipette 0.8 ml. of the prepared stock – solution into a test tube and then add 2 ml. of chemical reagent #8 and 1 drop of chemical reagent #9A and also 2 drops **only** of the previously prepared solution #9, mix well by shaking the test tube and read the soil test value immediately within 1 minute.

*Noted that :*

1. With the presence of the precipitate in the test tube means: High available - K.
  2. Clear liquid without any precipitate means: Low available - K.
  3. With the light orange color of the solution means: Moderate amount of available – K
- (Anyway, also checking/compared with the standard color chart for sure)

Source: Soil analysis manual (translated from Thai)

## Appendix7: Soil analysis result

Soil samples taken from cassava fields	Soil analysis result after crop harvest			
	N-NO3	P	K	PH
field # 1	Very low	medium	high	6.5
#2	Very low	medium	medium	6.5
#3	Very low	medium	low	6.5
#4	Very low	high	medium	6.5
#5	Very low	medium	low	6.5
<i>Overall assessment</i>	<i>Very low</i>	<i>medium</i>	<i>Low- medium</i>	<i>Slightly acidic</i>
Soil samples taken from maize fields				
field #1	Very low	Very low	medium	6.5
#2	Very low	medium	low	6.5
#3	low	high	low	6.5
#4	Very low	high	medium	6.5
#5	Very low	Very low	low	6.5
<i>Overall assessment</i>	<i>Very low</i>	<i>medium</i>	<i>low</i>	<i>Slightly acidic</i>

Grading	NO3-N ppm or mg/kg	Available Phosphorus, ppm or mg/kg	Available K ppm or mg/kg
Very low	1-10	-	-
Low	11-20	1-3	0-40
Medium	21-30	4-6	41-60
High	31-50	7-9	61-80

Source: Quick test quick Soil analyst

	Land use and tenure		Agronomic information			Socioeconomic information					Physic-cultural factors			
	Land use classification for	Land ownership	Yield obtained last year [ton/rais]	Amount of fertilizer kg per rais used last year	%age proportion of chemical fertilizer used in NPK form	Cost of input + debt and interest @ 3% /month in Baht	Revenue/income in Baht	Net revenue from sale of crops In Baht [Net income per rais]	Satisfied with this income?	Off farm work from the family member(migration to another place)?	Physical Factors (all using tractor)	Cultural practices	Soil erosion problem?	
field # 1	A.C	Acquired/ Owner	14,000 kg from 7 rais [2 ]	25+128.57 FYM	15-15-15	4550+0	30,000	25450 [3635]	No b/c high cost of input & sales price instability	Her is permanent employee as elementary school teacher	2 times ploughing	-Burn -crop rotation with 2 year cassava & 1 year maize	Yes due complex slopping nature & tractor effect	
#2	A.C	Owner										-burn		NA
#3	A.C	Owner	30,000 kg from 15 rais [2]	Not applied	Not applied	1440+20,000 +7200= 28640	66,000	37360 [2491]	No b/c of poor productivity & sales price instability	1 person temporarily	2 times ploughing	-burn - Monocropping	Relatively no b/c the land is gentle slopping	
#4	A.C	Owner										burn		NA
#5	A.C	Owner	69,000 kg from 23 rais [2.7]	25	15-15-15	39215+0	151,800	112585 [4895]	Yes, but still sale price instability is complained	2 of the members in the offseason & 2 of them migrated to the town and working permanently	1 times ploughing	-burn - monocropping	Yes, the land is very sloppy and tractor effect	
Overall assessment	A.C	Owner	[2.2]	25	15-15-15			[3674]				burn		
Soil samples taken from maize fields														
field #1	A.C	Rent/hired										burn		NA
#2	A.C	Rent/hired	80,000 kg from 100 rais [0.8]	25+ 50 [75]	16-20-00 46-20-00	357,600+ 80,000+12000= 449600	560,000	110400 [1104]	No b/c high cost of in puts & sales price instability	Yes, 2 people of the family member during the offseason	2 times ploughing	-Burn - Monocropping	Yes, b/c of the sloppy nature of the soil and tractor effect	
#3	A.C	Rent/hired										burn		NA



#4	A.C	owner	70,500 kg from 25 rais [2.8]	25+ 50 [75]	16-20-00 46-00-00	55, 953	521700	465747 [18629]	Yes, but sale price instability is complaine d	Yes, 2 member of the family temporarily	2 times ploughing	-Burn (NI) -crop rotation with cassava	Yes due sloppy nature & tractor effect	
#5	A.C	owner	56,000 kg from 23 rais [2.4]	25+ 50 [75]	16-20-00 46-00-00	163,975	403,200	239225 [10401]	Yes, but sale price instability is complaine d	2 of the members in the offseason & 2 of them migrated to the town and working permanently	2 times ploughing	Burn - monocroppin g	Yes due sloppy nature and tractor effect	
<i>Overall assessment</i>	<i>A.C</i>		<i>[2]</i>	<i>25 50</i>	<i>16-20-00 46-00-00</i>			<i>[10045]</i>						

Appendix 9: Wealth Map



[illegible]



# Appendixes 11: Problem Ranking

Problem	NUMBER OF VILLAGERS							LEVEL OF RANKING	Should be saved first	RANKING
	1	2	3	4	5	6	7	จำนวนรายครัวเรือน	จำนวนหมู่บ้าน	
ปัญหาหนี้										
DEBT	4	3	1	2	1	1	1	(13)	4x1	1-THE WORST
LANDLESS	5	1	2	1	2	5	2	(18)	3x2	
LOW SOIL QUALITY	1	2	5	4	5	4	5	(26)	5x3	5-THE LEAST BAD
HIGH COST OF INPUTS	2	2	3	3	3	2	3	(18)	4x4	
LOW LEVEL OF EDUCATION	3	4	4	5	4	3	4	(27)	3x5	
LACK OF SUBSIDY				2		1	3	(6)	2x6	ADDED BY VILLAGERS
LACK OF PERMANENT JOBS				1			5	(6)	1x7	
NO POSSIBILITY TO CHANGE SPECIES TO CERTIFICATE				1				(7)	1x6	
LOW PRICE OF YIELD									1x6	

**Appendix12:** Per capita income by region in Thailand, 2004

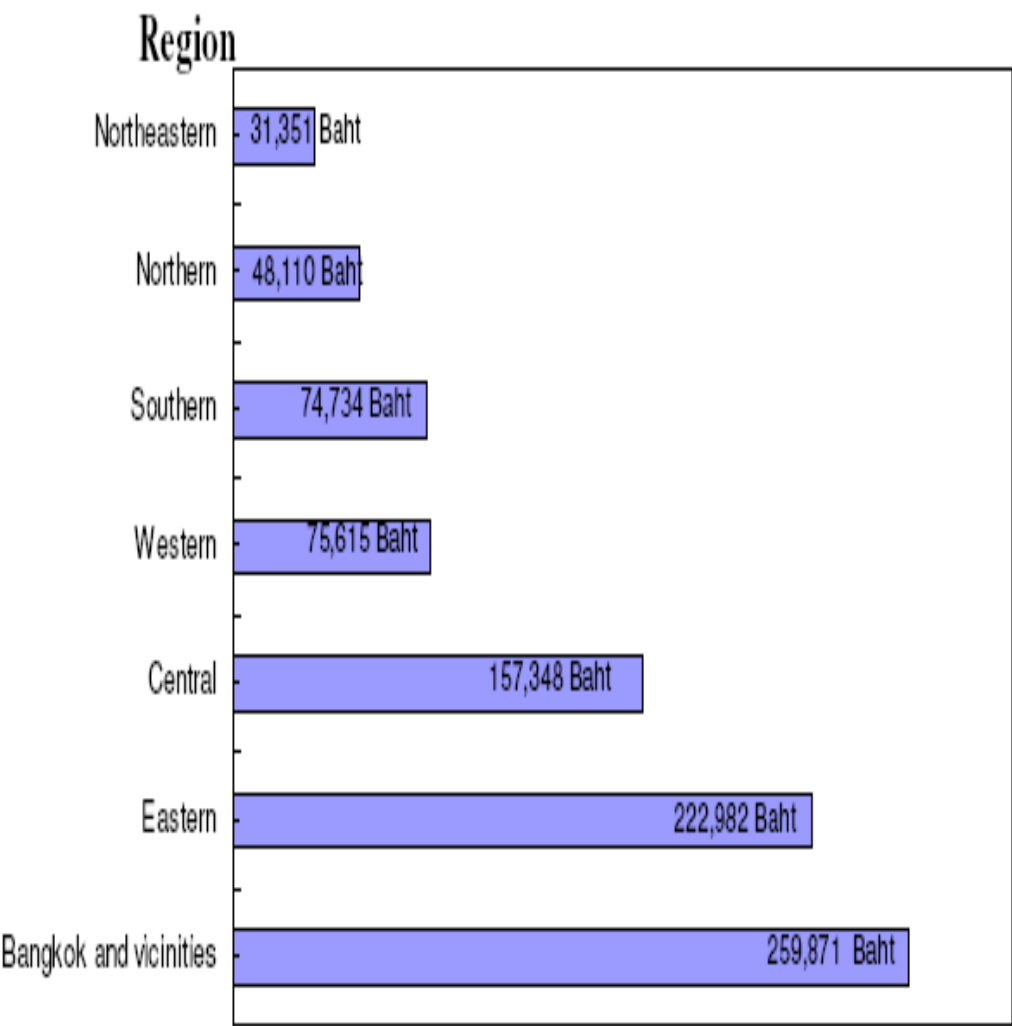


Figure 2.1: Per Capita Income by Region in 2004

Source: National Economic and Social Development Board, 2006