

# **LIVELIHOOD STRATEGIES IN KAMPUNG DANU**

Final report

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## **Preface**

This present project report is part of the Interdisciplinary Land Use and Natural Resource Management (ILUNRM) course under the SLUSE Consortium. The course was carried out in collaboration with students from UNIMAS from the 06 February to 11 April 2006. The SLUSE programme is a multidisciplinary joined field course on Sustainable Land Use and Natural Resources Management. The study area was kpg. Danu and more specifically the Bidayuh community of kpg. Danu in Siburan District in the State of Sarawak, Malaysia.

The implementation phase consisted of two stages: Discussion with Malaysian counterparts about the final research plan and proposal, data collection and preliminary findings during the 2-week field trip in Sarawak, Malaysia (from 05 March to 20 March, 2006); and from 20 March to 11 April, 2006, data processing, data analysis, interpretation of the results, report writing and submission of final report to KVL in Denmark (for individual diary, see Appendix 1).

## **Acknowledgement**

We are deeply indebted and would like to express our thanks and appreciation to our supervisors Torben Birch-Thomsen, Institute of Geography, KU and Andreas de Neergaard, Plant and Soil Science, KVL for their advice and encouragement, insight, support and assistance of an enormous scale during the class, exercise sessions, fieldwork as well as preparation of this present report in multiple ways.

We would like to thank our Malaysian counterparts: Ringgit Dinggat, Niponi Undek, Penny Sumok, Paul Tulik, Liew Ke Bo, Lim Lee Khiang and Nyanggau Nuing for a pleasant collaboration during our field trip. It has been a great experience, both socially and academically, to work interdisciplinary and internationally. Furthermore, we would like to thank the UNIMAS supervisors, organizers, coordinators and our interpreter Mr. Andrew Jeremy for their large-scale support during our stay Danu, Sarawak.

We are also deeply indebted to Mr. Ahip ak Naii, Village Committee Headman (Village Chief), and Mr. Kanis ak Reji, Village Committee Agricultural Representative, kpg. Danu; Mr. Dakon Ahmit, Agricultural Assistant in Project Monitoring Unit & Mr. Victor Douglas Abang, Agricultural Assistant, Department of Agriculture (DOA) for provided us their valuable time for interviewing to the present project work. We would also like to express our thanks to the kpg. Danu Village Committee, especially Mr. Cr. Mike Deros Mapus, Advisor, Nigos ak Sinsai, Assistant Village Chief and Robert ak Ringang, Village Secretary for their time, supports, cooperation during our stay in Danu.

We would like to thanks all the villagers in kpg Danu for letting us stay in the village, for the patience they have shown during the interviews, time and cooperation in multiple ways. With out their supports it would not be possible to prepare this present report. We felt really welcome and grateful to experience everyday life in kpg. Danu.

Last but not least we would like to thank the Mr. Nigos ak Sinsai's wife for providing us supports in the form of cooking and maintaining our base camp.

## **Abstract**

We have considered the livelihood sustainable framework in order to analyze our main research question. Our analysis is centered around the impact of the new road on the livelihoods in kampung Danu. The analysis is carried out in levels of abstraction; community level and household level. We have used the five capitals in the livelihood framework to analyze if the livelihood has improved after the road was constructed. The conclusion is the road has had an impact on the livelihoods in kampung Danu on both levels of abstraction. There is though a differentiation within households upon the degree of impact the road has had.

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## List of Abbreviations

<b>CPM</b>	<b>Community Participatory Mapping</b>
<b>Kpg.</b>	<b>Kampung (village)</b>
<b>DoA</b>	<b>Department of Agriculture</b>
<b>CEC</b>	<b>Cation Exchange Capacity</b>
<b>RM</b>	<b>Rinngit (the local currency)</b>
<b>HH</b>	<b>Household</b>



## **Concepts and definitions**

The following concepts and definitions have been considered to analyze livelihoods strategy in our research.

### **Household (s)**

The household is the basic unit of analysis for our research. For our purpose household refers to all individuals who live in the same house.

### **Livelihood (s)**

Chambers and Conway (1992) define livelihood as:

“A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base” (cited in DFID, 1999: 1.1).

### **Livelihood strategy**

“The more choice and flexibility that people have in their livelihood strategies, the greater their ability to withstand – or adapt – the shocks and stresses of the *Vulnerability Context*”. (DFID, 1999: section 2.5).

### **Vulnerability Context**

The external environment in which people exists. Livelihood and asset are affected by external factors like trends, shocks and seasonality (DFID, 1999: section 2.2).

### **Better livelihoods**

Improvement of human, financial, physical, natural and social capitals that provides a bigger room for maneuver.

### **Assets Pentagon**

“The asset pentagon lies at the core of the livelihoods framework, ‘within’ the vulnerability context. The pentagon was developed to enable information about people’s assets to be presented visually, thereby bringing to life important inter-relationships between the various assets. The shape of the pentagon can be used to show schematically the variation in people’s access to assets.

### **New road**

The road there was constructed from Bengoh to Danu in 2003.

**Agricultural intensification**

An agricultural intensification is an increase input e.g. labor or fertilizer without necessarily having increased production or size of land. We will mostly look at intensification which has lead to an increase in production.

**Expansion of agriculture**

Increase in cultivated land.

**Cash crops**

Crops those are cultivated for a commercial purpose. In kpg. Danu we have considered pepper, rubber, banana and cocoa as cash crops.

**Workforce capability**

The workforce capability is the capacity, ability and availability of labor: age, health, education and training are factors that influence the workforce capability.

# **1. Introduction**

## **1.1 Introduction to the study area**

Kpg. Danu is a Bidayuh village located at N: 01° 16' 33.0" & E: 110° 14' 37.1" which is 40 kilometers from Kuching (figure 1). The Kuching-Borneo Heights Resort Road leads to kpg. Bengoh and from Bengoh there are 2.8 kilometers of partly gravel road to Danu. The road was first constructed in 1999 but was not completed because of the limited budget. Only half way and after YB James<sup>1</sup> won the election in 2000, he completed the gravel road to Danu. The tar-seal covering the last part of the road was constructed in 2005 and cost RM 400,000. The suspension bridge was completed in 2003<sup>2</sup>.

The village is situated on the other side of the Kiri River and is surrounded by mountain ranges, which have a limiting effect for the development in kpg. Danu. The suspension bridge that leads to the village is not for four wheeled vehicles, so cars are not seen in the village. The first people moving to Danu were 7 brothers. They moved to Danu from Bengoh.

The land in kpg. Danu is inherited from generation to generation, the plots are scattered around the surroundings and some villagers still have fields in kpg. Bengoh. Land scarcity and increased population forced Bengoh villagers 120 years ago to move, settle down and form Kpg. Danu. This was informed during the community mapping. There are currently 46 households occupied in kpg. Danu.

The climate in the area is influenced by the northeast and southwest monsoon. The rainfall and humidity is high in the area. Land use in the area includes large multipurpose forest areas including rubber tapping, agricultural land and water resource.

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<sup>1</sup> Y B James is a head politician in the Siburan District.

<sup>2</sup> This information was given to us from Andrew Jeremy, our interpreter pr. E-mail



Figure 1; Location map of Kuching showing Kampung Danu. The new road constructed in 2003 can not be seen in the map (Source is missing, provided by Malaysian counterparts).

The villagers have Native Customary Rights (NCR) on their lands. They do not have titles of their land. The following Box 1 represents the NCR rights.



### Box 1.1: Native Customary Rights

- 1954: Forest Ordinance mandate reservation of Permanent Forest Estate (PFE).
- 1958: Sarawak Land Code created NCR; Native Customary Rights. Rights to land which had been used by indigenous people before January 1, 1958.
- NCR allowed people to cultivate in designated areas known as Native customary land (NCL).
- Uncleared land was now claimed by the state, so further clearing by indigenous was only allowed with permission.
- Created to provide security for forest farmers, but the definition of NCL is vague which make local peoples rights and control over land unclear.

Source: Horowitz; 1998, Human Ecology, vol. 26, No. 3: 386-387

The main food source is from rice produced in shifting cultivation in kpg. Danu. The main sources of incomes are from cash crops mainly banana, cocoa, pepper and rubber. Tapping of rubber has increased because of a rise in demand and prices on the market. Information from villagers was that the new road has provided an increase in agricultural production especially for cash crops. We decided to focus on these four main cash crops in kampung Danu because it seemed that every farm had at least one of these four crops. The villagers also informed us about the different agricultural schemes which were supplied by the Department of Agriculture in kpg Danu. Currently there is a banana scheme available in the village



To make white pepper, the berries will soaked for eight nights followed by two days drying under the sunlight. For black pepper, the berries will be directly dried under the sunlight for about three days.

### BOX 1.2: Pepper.

### BOX 1.3: Banana



In kpg. Danu, mainly two types of bananas are grown through the Department of Agriculture Banana Scheme. The big types mainly weigh from 25 to 30 kilograms per bunch of banana. The small types, only weigh between 10 to 15 kilograms per bunch. Banana will take a period of 9 to 12 months before bearing fruits.

According to the villagers, electricity is one of the major problems they are currently facing. Electricity is generated from individual generators as the village is yet to be linked by the public power line system. Electricity is only used in the evening

and because of the increase of petrol prices, there is a decrease in the use of generators. The use of generators has some negative consequences such as, noise pollution, oil spill, etc.

Our own observations in the village provided us with ideas to our research problems. In our synopsis we dealt with livelihood strategies and to assess the problems in the households we considered different capitals (DFID, 1999: chapter 2). The Malaysian counterpart had also incorporated livelihoods strategies in their synopsis. This provided us with a common ground.

We observed that most of the villagers were elderly people (50+ years). The age structures in kpg. Danu made us reflect over the health situation within the village because most of the villagers' in kpg. Danu was farmers.

Migration is a problem in kpg. Danu, because the young generation is migrating which could lead to labor shortage in the area. We considered looking at migration, but we decided our focus was on the villagers in kpg. Danu and their current situation. Our reflections on the migration issue were that it would include people who did not live in Danu. We decided to ask about relatives living permanently outside the village in the questionnaires to get an idea about remittances.

The preliminary observation and information gathered are all related to household livelihoods and lead us to identify our main research question, three hypotheses and six objectives for our research. Our study is based on two levels of abstraction: community level and household level within the community.

## **1.2 Objectives and research question**

The main objective of this research work is to analyze the livelihood strategies in the kpg. Danu.

### **Main research question**

How has the new road impacted the livelihoods strategies in kpg. Danu in terms of agricultural practices?

### **Hypotheses**

1. The new road has increased sources of income from agricultural productions
2. The new road has lead to better livelihoods to the villagers
3. Electricity will bring better livelihoods to the villagers

### **Objectives**

1. To estimate existing household incomes
2. To compare agricultural productions (both in terms of practice and productivity) before and after the road was constructed
3. To assess the agricultural intensification and expansion of agriculture in the village
4. To assess the current workforce capability (age, health, education and training) in connection with agricultural activities
5. To assess the role of the Department of Agriculture (DoA) on agricultural activities in the village
6. To assess the demand/need for electricity in the village



Photo: The suspension bridge to kampung Danu.

## 2. Conceptual framework

### 2.1 The sustainable livelihoods framework

The sustainable livelihoods framework provides us better understanding to analyze the livelihood strategies in kpg. Danu (Figure 2.1.1). The reason to consider this framework is that it provides a checklist of important issues and shows how these are linked; furthermore it draws attention to core influences and processes, and it shows the interactions between the various factors, which affect livelihoods (DFID, 2002: section 2.1).

The figure contains different factors, which can help us to analyze what have been important for the improvement of the livelihoods in kpg. Danu. The arrows in the framework (Figure 2.1.1) present different kind of relations and influences between the different factors but none of them imply direct causality. The framework consists of different factors that are all interrelated.

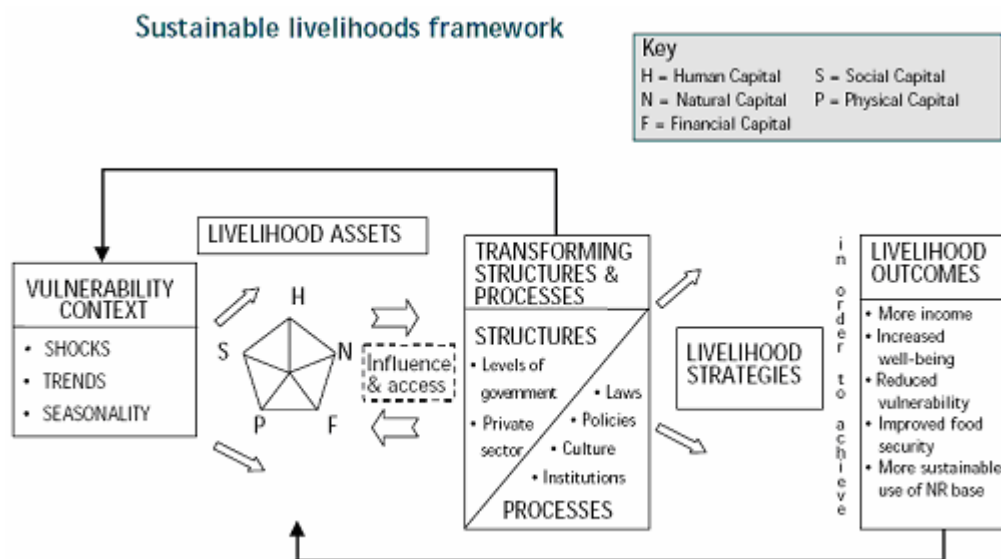


Figure 2.1.1: Sustainable livelihoods framework (Source: DFID, 2000: section 1.1)

The livelihood outcomes are achievements from the livelihoods strategies. The outcomes are again linked to the capitals in the sustainable livelihood framework. These are the human, natural, physical, social and financial capitals (box 2.1). There can be different kinds of outcomes, which are valued differently according to the situation. The livelihoods outcomes are increased well-being, higher income, more sustainable use of



the natural resource management, improved food security and reduced vulnerability (DFID, 1999: section 2.6).

### Box 2.1: Sustainable livelihoods capital

<b>Human capital</b>	<u>skills, knowledge &amp; information</u> , <u>education</u> , <u>ability to work</u> , <u>health</u>
<b>Natural capital</b>	<u>land</u> , water, wildlife, <u>biodiversity</u> , environment
<b>Financial capital</b>	savings, credit, <u>remittances</u> , pensions, <u>subsidies</u> , <u>income</u>
<b>Physical capital</b>	<u>road</u> , <u>transport</u> , shelter, water, <u>energy (in the form of electricity)</u> , communications
<b>Social capital</b>	<u>networks</u> , groups, <u>trust</u> , <u>access to institutions</u>

The sustainable livelihoods framework has been considered as a tool to understand and analyze the livelihoods of kpg. Danu. We have considered the capitals which are highlighted in box 2.1. We will visualize the villagers' livelihood capitals into the pentagon (see Figure 2.1.2), as it is an important component that lies at the core of the livelihoods framework (DFID, 1999: section 2.3).

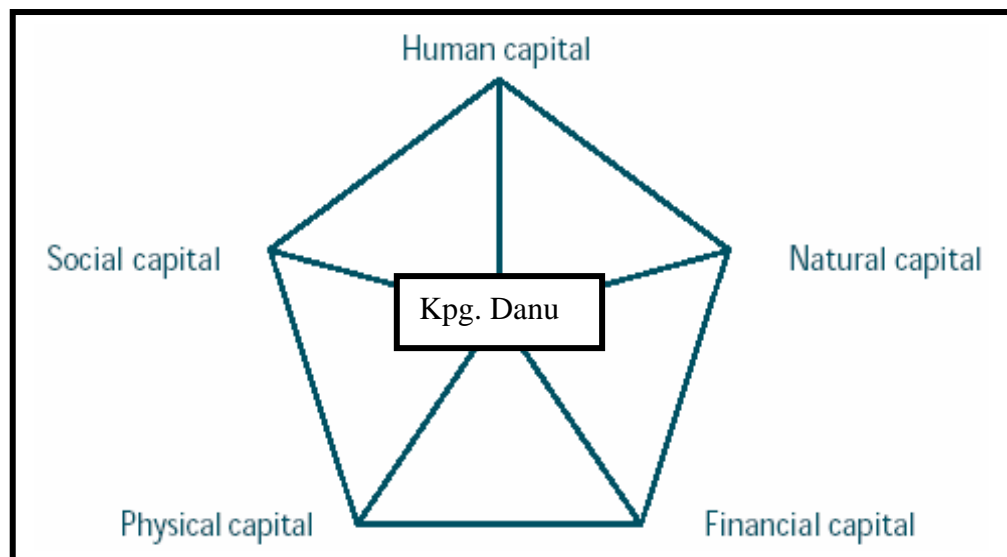


Figure 2.1.2: The assets pentagon (Source: DFID, 1999: section 2.3)

### 3. Methodology and methodological challenges

This section provides a detailed description of data collection techniques that were used during the data collection phase in the study area.

#### 3.1 Proposed methods, data and data collection techniques

The tools for gathering useful information to this study were different methods. In addition to this, the information presented in this report was generated by a desk-based literature review. Details description of proposed methods, data and data collection techniques are provided in the following figure 3.1.1.

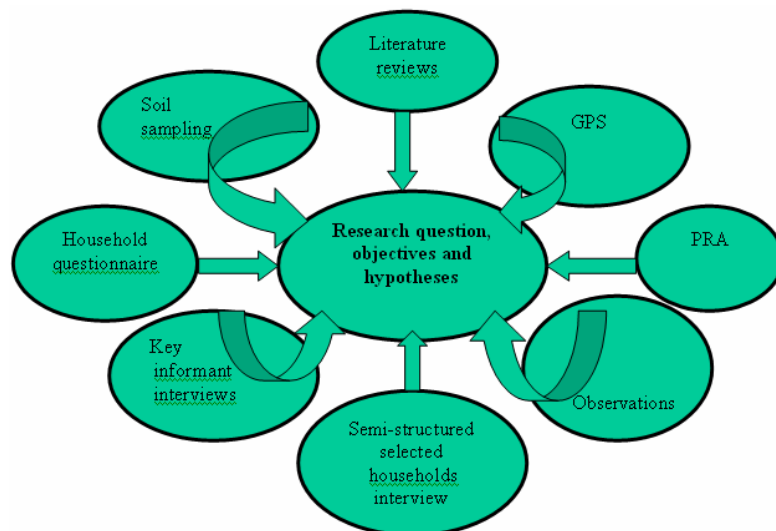


Figure 3.1.1: Project design

#### Participatory Rural Appraisal

PRA tools facilitate collection and analysis of information by and for community members. It is a form of qualitative research used to gain in-depth understanding of the community problems, perceptions, resources, opportunities and potentials. The reason for choosing PRA approaches was not only to involve people in the processes but also enable us to involve people within the community by learning and exchanging information. Another purpose of using PRA approaches was to crosscheck information from different sources so called 'triangulation'.

**Table: 3.1.1 PRA Methods**

<b>PRA approaches</b>	<b>Main purpose for our research</b>	<b>Participants involved</b>	<b>Remarks</b>
Timeline	The purpose was to get an overview of the important events of the village history, when the DoA provided agricultural schemes, when the floods occurred and development of village facilities and infrastructures etc.	8 farmers and 2 members of the local community participated in the exercise	We have reconstructed the timeline from photos and notes taken at the session and mail correspondences with interpreter.
Community Participatory Mapping	The objective of the exercise was to get a quick overview of the village, general conditions of the village and its environment. The exercises purpose was to get an overview over topography, field locations etc.	Male farmers, one of which was the village secretary.	The village secretary had prior to our stay in the village made a map of the residential area, so we concentrated on the agricultural areas.
Transect Walks	The main purposes of these exercises were to gather information of agricultural activities in the village and make our own observations about the fields and the surroundings. The results of the observation are presented in tabular forms.	In each transect work, local guide, interpreter and students were participated.	The 3 transect walks were different in nature, so it was difficult to compare the information we gathered.
Venn Diagram	The diagram was mainly used as a means of identifying established relationships between kpg. Danu and its agricultural institutions and markets for selling agricultural productions in order of their relative importance.	The participants included: 2 members of the village committee and 4 male farmers, and 2 women farmers.	We decided to exclude some of the institutions and organizations because it was difficult to explain the exercise..
Cropping Calendar	The specific objective of the exercise was to get the participants in the exercise, to identify and characterize the annual agricultural activities. In addition to these, the objective was to obtain information regarding the labor intensity and seasonal harvesting differences for the different crops.	We got 11 of farms to participate. They included the headman, 3 women and 7 male farmers participated in the exercise.	The headman was eager to “hold the pen”, so we decided to keep him busy with other activities. We moved the paper and pen to the other participants to ensure that everyone participated in the exercise.
PRA Ranking and Scoring (appendix 3)	The main reason to use the ranking and scoring in our investigation was to investigate villagers’ motivations and hence opinions and importance about the main problems associated with cash crops production before the new road, main opportunity associated with livelihood strategies after the new road, and main preference associated with crop selection after the new road.	For problem and opportunity ranking and scoring exercise we used six male participants. For the preference ranking 6 participants including 2 women farmers.	Participants generally appeared to enjoy participating to this PRA ranking and scoring exercises.

Observations	Observations would yield data that are comparable on the inter-observer basis and hence can be afforded well-grounded generalization.	All students	Participating, listening, communication, as well as a range of other forms of being, doing and thinking
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### Box 3.1: Timeline



The photo shows our timeline exercise we did with the villagers. We lost the data from the timeline, but we have reconstructed it with help from our interpreter Andrew Jeremy.

Timeline recovery/reconstruction:

1976: Big flood

1997: Apply for electricity at SESCO

1999: Gravel road partly constructed

2001: DoA; Banana scheme

2002: Suspension bridge construction began

2003: Gravel road and suspension bridge completed

2002, 2003, 2004: Flooding

2005: Tar-seal of first half of gravel road

2005: Landscape price

Method Questionnaires (appendix 2)	Purpose To get an overview of livelihood strategies in the study area on the level of the household and community	Participants Household is the unit of analysis and our total sample size was 41 out of 46 households.	Remarks The questionnaires provided data mainly used for quantitative analysis. The questionnaires contained closed-ended questions.
Semi-structured interviews	To get an in-sight in the differentiation within the households and an in-depth knowledge about their livelihoods. The questions can be seen in box 3.2.	We selected 9 households from 41 household questionnaires for semi-structured interviews.	The basis for selection criteria for the households semi-structured interviews were as follows: 1. Households who have increase agricultural productions (mainly cash crops) after the 2. The new road was constructed Households' who have the same production level before and after the road. 3. Households whose livelihoods depend on off farm incomes (e.g. trading, labour, craft, remittances, pension, etc). The results of these interviews were useful to cross-check that information obtained from questionnaires, semi structured interviews and PRA.
Key-informant interview	The purpose of conducting key informants interview was to gather qualitative information on a given topic e.g. the community and the structure in the village.	<b>1. Ahip ak Naii, Village Committee Headman (Village Chief), Kpg, Danu</b> The purpose of the interview was to investigate and obtain an insight from the headman about the general information, including agricultural activities currently taking place in the village. Another purpose was to obtain information about his role as a middleman. <b>2. Kanis ak Reji, Village Committee Agricultural Representative</b> The purpose was to get information about different agricultural schemes by the Department of Agriculture in Kpg. Danu. <b>3. Mr. Dakon Ahmit, Agricultural Assistant in Project Monitoring Unit &amp; Mr. Victor Douglas Abang, Agricultural Assistant, Department of Agriculture (DOA)</b> The purpose of the key informant interview was to gather in depth information about the agricultural schemes.	
Soil sampling	To have a data on the agricultural land in Danu to assess the natural capital	Sampling was carried out by Malaysian as well as Danish students.	Laboratory work was carried out in Denmark.

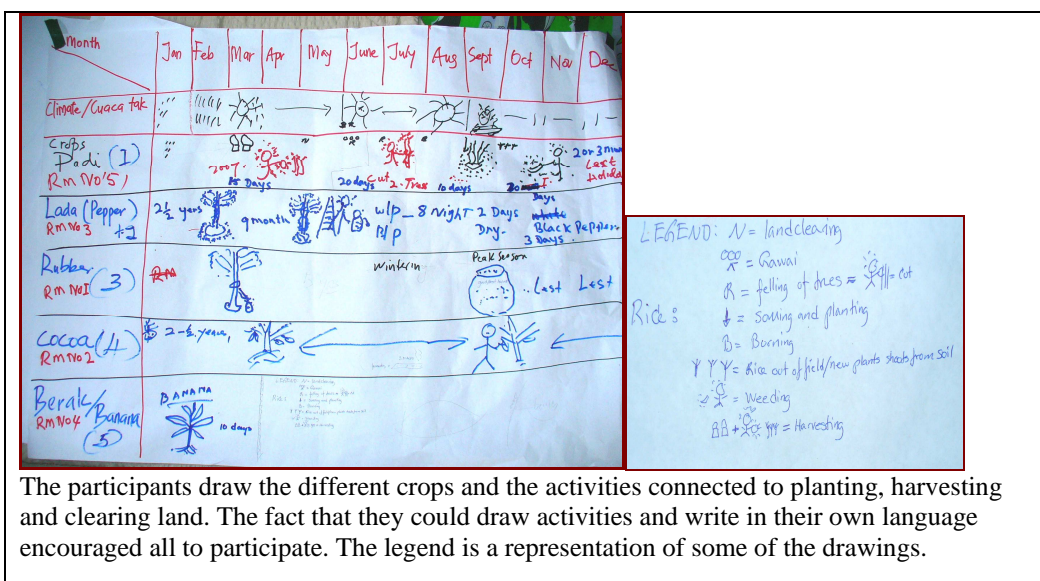
**Table 3.1.2 Methods**



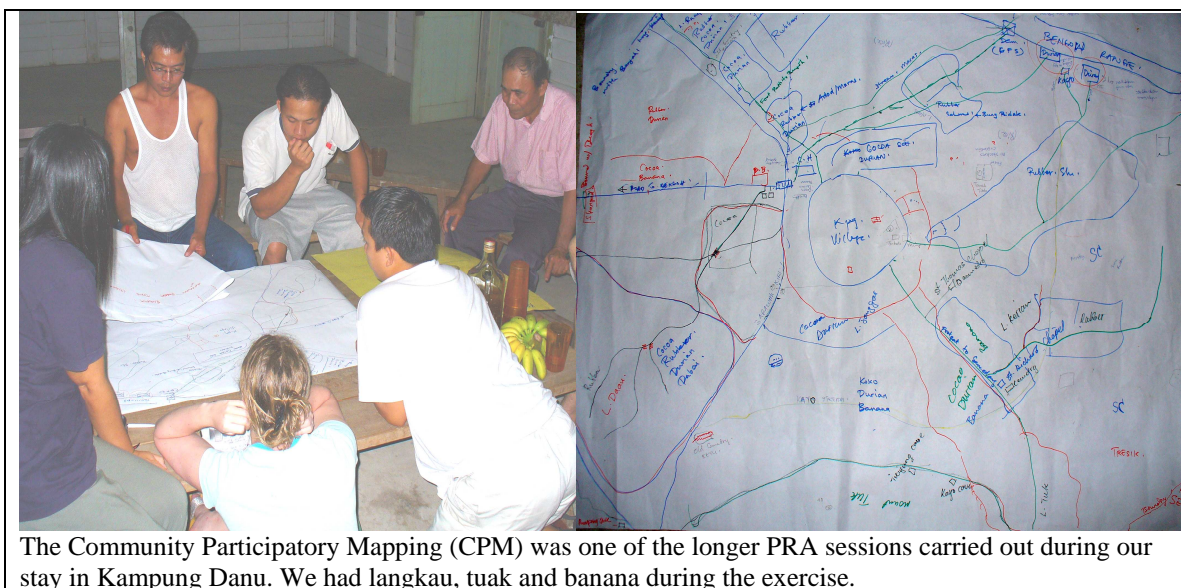
### Box 3.2: Questions guideline for selected semi-structured household interviews

1. Has the new road increased your incomes (both on farm and off farm)? How? If no, please continue to question number. 3.
2. How do you sell your products (via middleman or directly to the market)?
3. How difference is the prices between the middleman and market?
4. How does DOA influence your livelihoods?
5. If the SESCO supply electricity, do you think it will influence your living standard?
6. Is there a better access to health services after the new road has been constructed? And do you get more health service than before? How?
7. Do you feel the road have improved your well-being?
8. Do you have any comments or suggestions?

### BOX 3.3: Cropping Calendar



### BOX 3.4: Community Participatory Mapping



## 4. Results, Analysis and Discussions

The data will be presented and analyzed in this section. It will be divided into six parts which are linked to our objectives. The data will be analyzed on two levels, a household level and a community level..

The figure below shows the no. of households in the different selection criteria groups. It shows the no. of the 9 selected households and to which group each household are belonging.

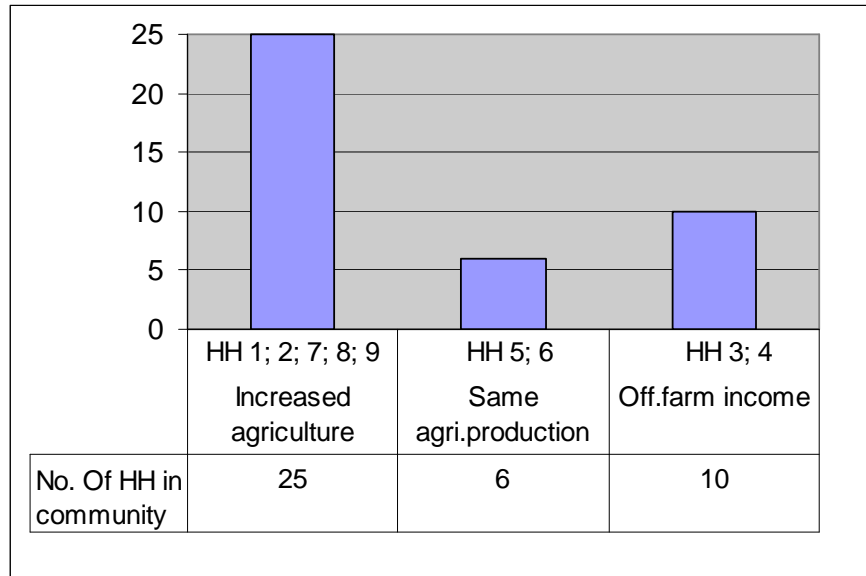


Figure 4.1: HH =Household

### 4.1 Household income

As the headline indicates; this section will mostly deal with the household level. This is because the income is individual from household to household. Based on the gathered information; we will try to estimate the community income level, even though it is not possible to calculate as exact as on household level. The households were asked about their income sources in the semi-structured interviews and the questionnaire. To estimate the household income we will look at the volume of agricultural production and the prices at cash crops and then calculate a result.

### **Community level**

The main source of income on community level was from the four cash crops mentioned in the introduction; pepper, rubber, banana and cocoa.

#### BOX 4.1.1: Cocoa



After the harvest of the cocoa, it will be let to ferment for 3 days and left to dry in the sunlight for another 3 days. The amount of fruits collected will depend on the input of the farmers such as maintenance of the cocoa plant and fertilizing.

From the cropping calendar session we know they rank the crops according to income importance. The importance in decreasing order is rubber, cocoa, pepper, banana and rice, with rice as the least important source of income, rice is usually for own consumption.

The headman informed about the prices of the cash crops; he mentioned both buying rates in the village and selling rates in the market. Most of the respondents in the selected households also knew the differences in prices from the middleman to the market. There was a slight difference in the prices given to us at around RM 0.05-0.30/kg. The following table 4.1.1 provides a detailed price list of cash crops obtained from the interviews<sup>3</sup>:

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<sup>3</sup> We made this list from the information we got and used the most realistic numbers e.g. 10 people gives us the same price on a product, 1 person gives us another price; we use the price the 10 people agreed upon.



Crops		Villagers sell to middleman (RM/kg)	Middleman sell in supermarket/factory /another middleman in town (RM/kg)	Middleman sell directly to the consumers (RM/ kg)	Villager directly sell in market (RM/ kg)
Banana		0.40	0.90 (super market)	1.20	1.20
Pepper	White	7.30	7.60(super market)	7.60	7.60
	Black	4.30	4.60 (super market)	4.60	4.60
Rubber		4.80 – 4.90	5.00 – 5.10 (factory)	5.00 -5.10	5.00 -5.10
Cocoa		3.00	3.40 (another middleman in town)	3.40	3.40

**Table 4.1.1: Crop prices (local village prices, market prices<sup>4</sup>) of the cash crops**

The prices from table 4.1.1 can help us calculate the different households' income on household level (see next part).

The DoA informed us that the price on rubber is high and the villagers are keen to tap rubber as they can earn between RM 50-100/month. We were informed from the CPM that today the pepper prices is low compared to the price in the 1980's, where it was RM 13/kg, so the villagers are not keen to participate in pepper schemes or maintain their pepper gardens because the income from rubber is much higher.

The table shows the differences in prices from middleman to market are largest with bananas. Everyone we talked to who produced bananas sold them through the middleman even though they went to the market with other products. If the villagers should sell the bananas themselves they would need to go to the market often because there are no storing facilities in kpg. Danu. Storing is not possible without electricity. This combined with the need of transportation could be their reason for selling through the middleman instead of going to the market themselves.

The participants of the CPM pointed out that it is difficult to maintain a stable income when market prices are constantly fluctuating. The department of agriculture does nothing to stabilize the market prices in form of minimum prices or economic support in any way.

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<sup>4</sup> Kuching market prices

## Household

The information we found about sources to household income from agriculture is presented in the figure below. The information is mainly obtained from questionnaires. Figure 4.1.1 shows the main source of income from cash crops in Danu is from rubber. This supports the DoA's statement that people are keen to tap rubber now, because the prices are high. Rubber stands as the absolute highest income source according to the figure.

Bananas which according to the questionnaires are easily maintained are the most popular cash crop to grow as figure 4.1.2 shows.

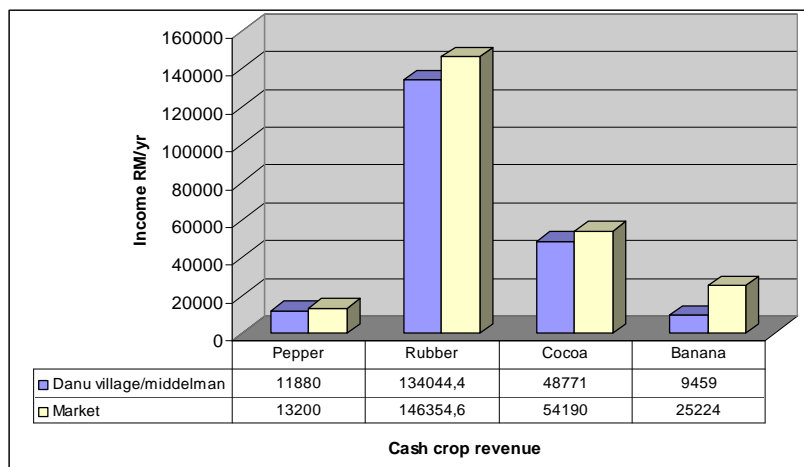


Figure 4.1.1; Income distributed on cash crops sold to middleman and market.

Rice is more popular because it is the primary food source. The economic surplus from bananas is not very high when the households sell to the middleman. All the selected households which have farm activities sell their bananas to a middleman even though the difference in prices, which can be seen in table 4.1.1 above, is largest. Figure 4.1.1 confirms this; the middlemen who buys products locally and sells them on the market, get the highest revenue from banana as the surplus value is 15765 RM/yr.

This supports the conclusion about bananas are more time consuming to transport because it has to be done more often.

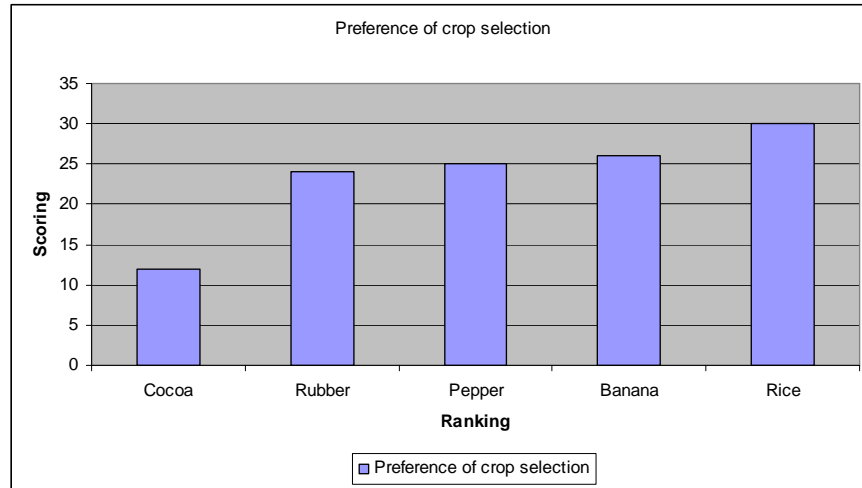


Figure 4.1.2; Preference of crop selection

Sources of income from other activities e.g. remittances and pensions are important to look into in Danu. Many households have children who have migrated according to the questionnaires. Other off-farm activities within the households in Danu as local shopkeepers, middlemen etc. has to be considered too. Figure 4.1.3 shows how many households are having other sources of income than agriculture.

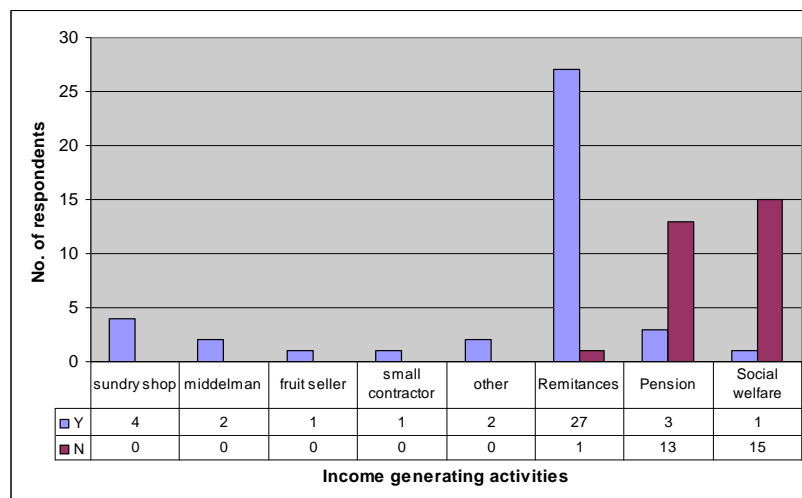


Figure 4.1.3; Income from other Activities

In Figure 4.1.4 we have tried to estimate each household's income on a yearly basis from both agriculture and remittances. Not everyone has a regularly income from remittances and their income is not in the graph because they did not give an amount on the questionnaire. Figure 4.1.3 show that 65% (27/41 HH) of the households receives some sort of remittances. Another weakness is that the figure does not depict reality, because the shopkeeper has a very low income because he does not get any income

from agriculture. Figure 4.1.1 showed there was high revenue on bananas for the middleman of 15765 a year on this one crop. The red pillar is one of the middlemen. The middleman has one of the highest gross income compared to the other households see figure 4.1.4.

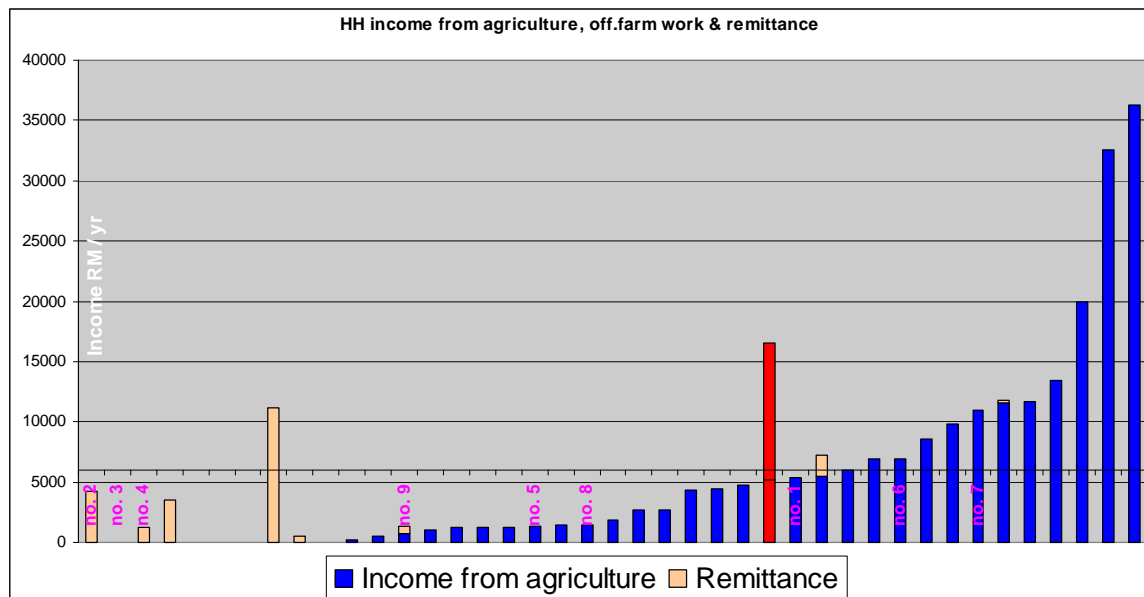


Figure 4.1.4: Income from remittances and from agriculture

Household no. 3 has informed they are dependent on their children, but not how much they receive in remittances.

The line which is shown at RM 6000 a year is the poverty level. We know from the key informant interview with the DoA's goal is to get the farmers income over the poverty level which is RM 500/month. Figure 4.1.4 shows this goal has not yet been reached since a lot of the households are well below RM 6000/yr.

Figure 4.1.5 shows the selected households income. We can see the big differentiations of income between the households. Again the figure is misleading because household no. 4 has a low income. We can from figure 4.1.5 conclude there is a big difference in income within the households. Even though the amount of remittances is not stated in all of the households, we know from the questionnaires, the amounts often are small and not regularly. We can conclude that many households in kpg. Danu lives below the poverty level. We can argue that more than 50% lives below the poverty level of the selected households.

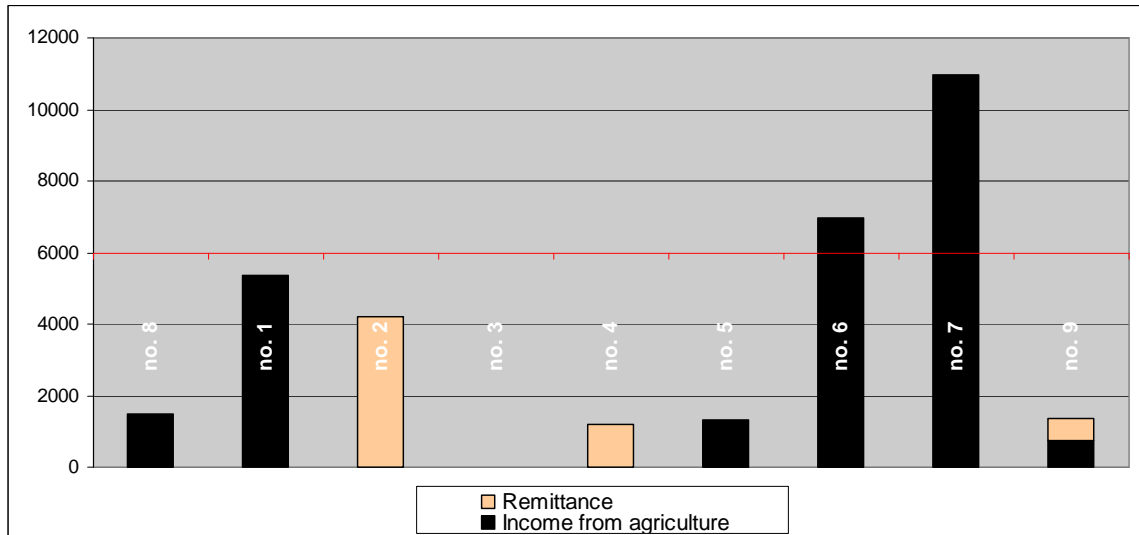


Figure 4.1.5; Selected household income

### Box 4.1.2

Table 1: Poverty Line Income, 1990 and 1997

Region	1990		1997	
	RM	Household Size	RM	Household Size
Peninsular	370 (185)	5.1	460 (230)	4.6
Sabah	544 (272)	5.4	633 (316.5)	4.9
Sarawak	452 (226)	5.2	543 (217.5)	4.8

Source: EPU

Note: Figures in parentheses denote income level of hardcore poverty.

From the DoA we were informed that the poverty line income in Sarawak is RM500/month = RM6000/yr. This information has been applied in our analysis of the data gathered. The table above represents the poverty line income (PLI) we found on the Malaysian governments website.

**Absolute poverty:** If the yearly household income in kpg. Danu, Sarawak is below RM6516 (RM 543/month); or for

**Hardcore poverty:** If the yearly household income in kpg. Danu, Sarawak is below RM3258 (RM 271.5/month) it is reason to consider the need to implement the poverty eradication program.

The table is from the Malaysian government Implementation and Coordination Unit (ICU) at <http://www.icu.gov.my/pdf/sabah.pdf>

**Note:** The different price level in the three regions is the main reason for individual PLI levels. There is an error in the table as the hardcore poverty line is always ½ of the absolute, so for the Sarawak region it should be RM271.5 /month.

**Conclusion section 4.1:**

The income level in kpg. Danu is in average low. Many households are still living below the poverty level. An increase in income could improve a lot of household's livelihood in Danu. The need for economic resources is increasing, which can be seen in box 4.1.1, where the amount of income a household need to be above the poverty level has increased since 1990. There is a big difference between the households; some households are above the poverty level.

A percentage of almost 66 households (27 of 41) are living below the poverty level according to figure 4.1.4. The sources of income and the level of income has increased on community level after the road was constructed which has given a better access to market. On household level most households have increased their income after the road was constructed. This gives us information which can help us prove our second hypothesis. The income level and sources of income is covered by financial capital in the livelihood strategies. We will have to consider this capital and the results and analysis of the results, when we estimate the room for maneuver in the asset pentagon in section

5.

## **4.2 Agricultural Production before and after the road**

In this section we present and discuss our results on agricultural production in kpg. Danu. We will not repeat the information found in the above section; we will add information to some problems and link the findings to each other.

### **Community level**

To get an overview over the area we brought GPS when we went for walks in kpg. Danu. This has provided us with a GPS map over the areas where the villagers have banana, cocoa rubber, pepper etc and where our samplings sites are.

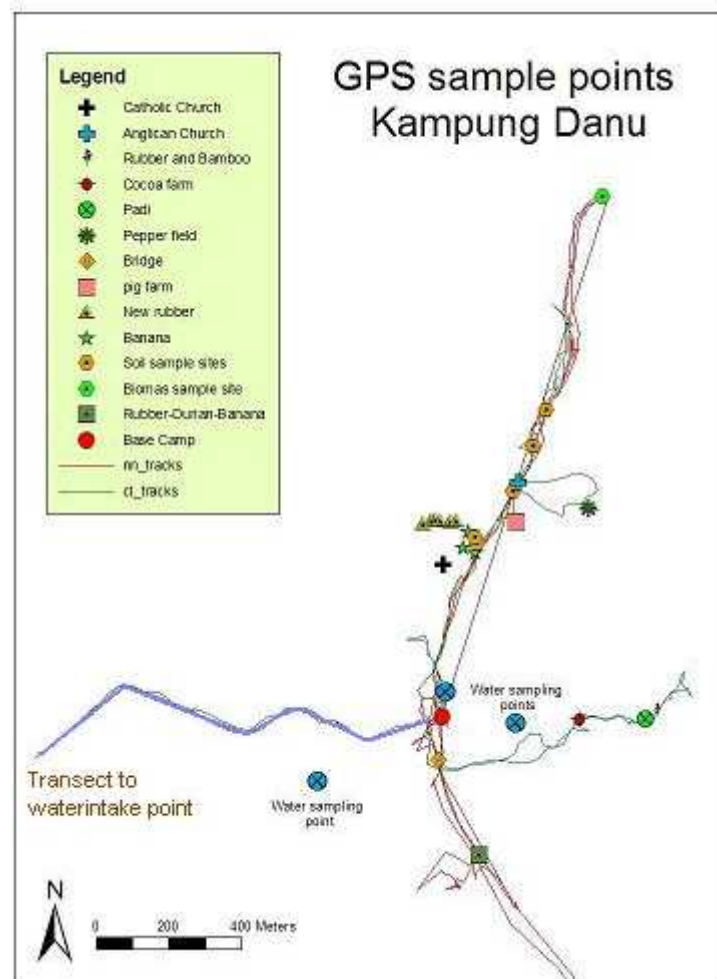


Figure 4.2.1; Verification map using GPS

The community participatory mapping gave us similar information about where different crops were grown in Danu. The GPS were used to try to confirm some of the information from the CPM in Danu. In the figure 4.2.2 below can be seen the GPS and the community map. If we compare the two maps we can see that the CPM is confirmed

to some extent by the GPS map. The villagers have a good overview and scaling over the area which are surrounding Danu and where they grow their crops.

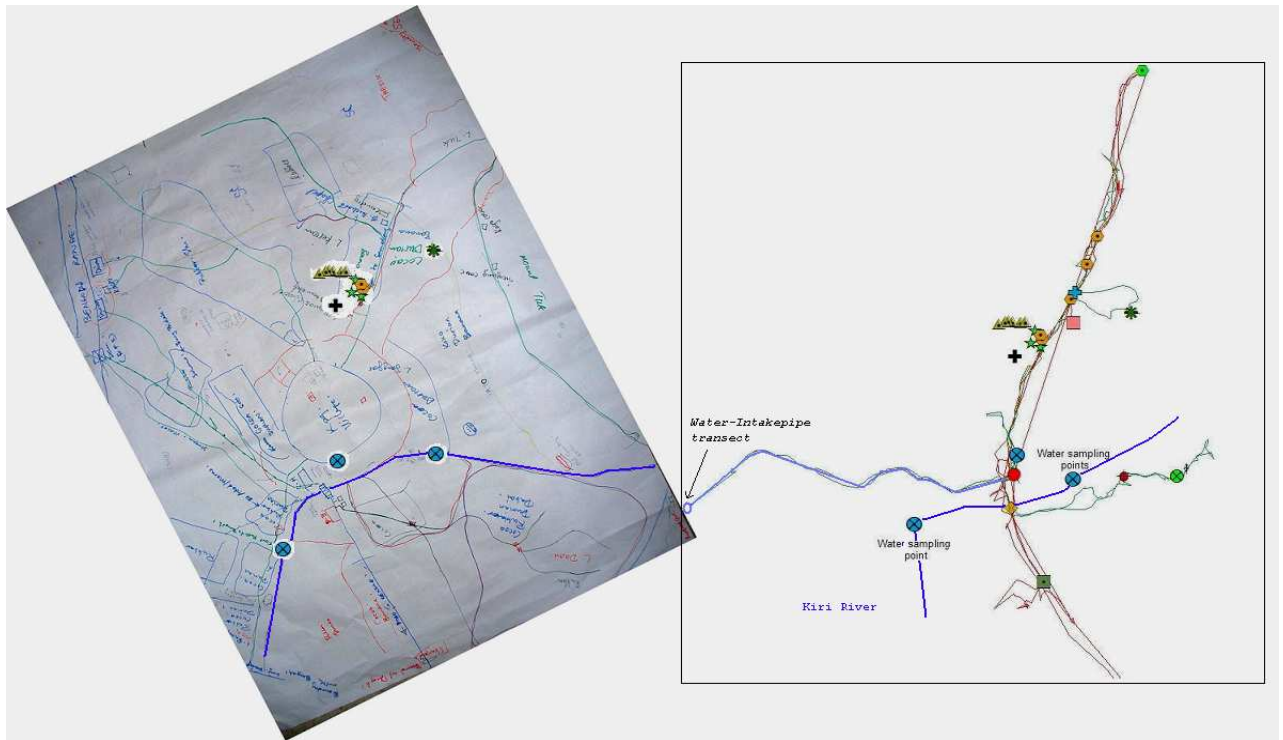


Figure 4.2.2; “merging” of CPM and GPS verification map.

We were informed from the CPM that cash crops are intercropped and there is a big diversity of crops, this was confirmed on our transect walks in the area. One of the guides informed us that seven different varieties of bananas were cultivated. The main crops were besides bananas; pineapple, lemongrass, durian and cocoa. We were informed there were regularly application of fertilizer and weedicides on the field.

The participants in the CPM informed us as we know from the above section that rubber, cocoa, banana and pepper are the most important cash crops in the area. Figure 4.2.3 illustrates the division in cash crops on land size. This can be a bit insecure numbers if we look at productivity, because there can be a lot more pepper on one acre of land than rubber trees. The most land demanding agricultural activity is rubber tapping and then cocoa, banana and pepper. Again the productivity has an influence on these percentages because of the different demand on land size for each crop. Fallow land obtains more than a third of the area around Danu, which mean there is a possibility to expand the production if necessary or possible. The large resources of fallow land can also be an effect from out migration.



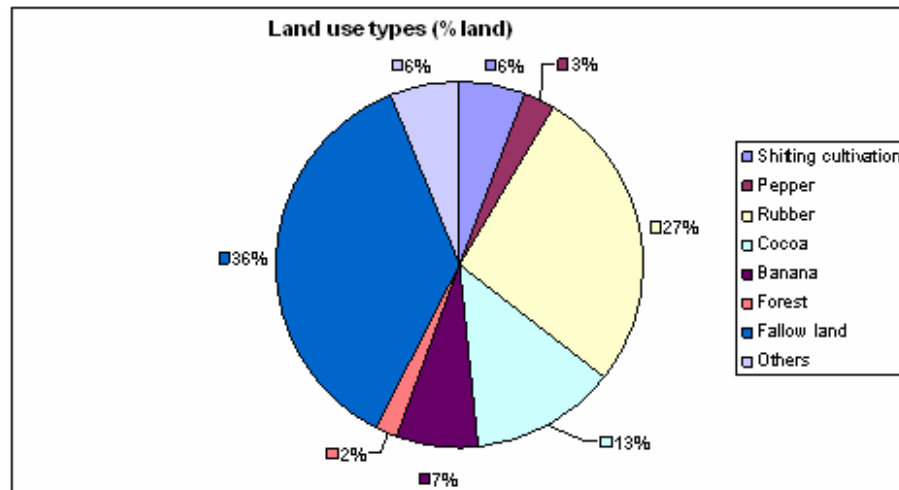


Figure 4.2.3; Crop production in percentage on the community level of the total amount of acres cultivated

The questionnaires informed us about different factors which influenced the selection of cash crops. Market prices have an influence as mentioned in section 4.1 which figure 4.2.4 below confirms. The road has had significant influence on the crop selection in the community.

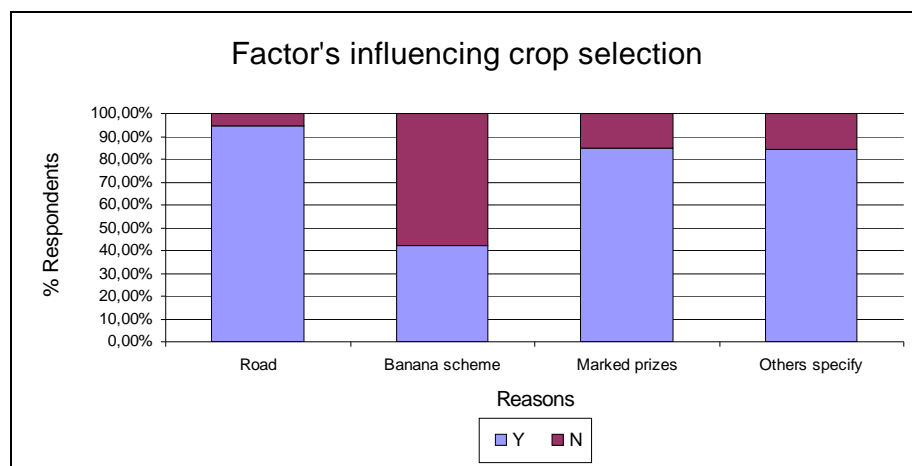


Figure 4.2.4; Factors influencing the crop selection in percentage

We have obtained information about the soil in the area from different sources as CPM, transect walks and soil samplings.

The participants from the community mapping informed us that rubber and pineapple can grow on sandy soils and bamboo indicates fertile soil.

Observations on soils from the transect walks was yellow/red-grey colors in the soil.

The surface was dry and hard with cracks. The area was in some locations rocky and visible huge lime stones in the soil underneath some of the fields. Some areas are

flooded every year which can be seen on the soil which are wet in these areas and sago palms can grow here.



As can be seen on the photos above the soils are quite red and yellow. This indicates the soil type is red-yellow podzolic soil. The red color could indicate the soil is rich on iron and aluminum. This soil type is typical in the region where Danu is located. Red-yellow podzol is well drained with kaolintic subsoil. The soil is pale in colour with thick concretionary layer, heavy texture and residual in nature. The CEC values and weathered clay content are very high in this group of soil. The parent materials are sand and stones, shale and acidic igneous rock. The structure can be massive in clay soil or crumb in sandy soil. General, Red-Yellow podzolic soil has an increase in clay content with depth (Andriessse, 1972: 165).

At the interview with the DoA we was informed the kpg. Danu area is famous for their bananas. We looked into the growth conditions for bananas:

Banana has a narrow range of tolerance and requires soil of high fertility. The roots of the herb tolerates only short periods of water logging but thrive well on free-draining and deep fertile loam, where good aeration is present. The delicate root of the plant can not penetrate compact clay without adequate drainage. The soil pH must range from 5.5 to 7.5 with the optimum being 6,5. In a well-drained sandy Clay loam (Haplustalf) uptake of N, P, Ca and Mg decrease with increasing water deficit but K was highest at - 65kpa.

P requirement of banana is low because they are able to remobilize phosphorus within the plant.

In the tropics the rate of up take of P is highest during the 2-3 months after planting. Aluminum and Mg toxicity do not appear to be problems of any significance.

The analysis of the soil samples we took can be seen in table 4.2.1:

**Table 4.2.1**

<i>Plot/Indicators</i>	<i>CEC</i>	<i>pH</i>	<i>Phosphorus</i>	<i>Aluminum</i>
<i>Units</i>	<i>ms/cm</i>		<i>Mg/g(soil)</i>	<i>Mg/g(soil)</i>
1	0,42	5	0,0003	0.002
2	0,4	4,9	0.03	0.004
3	0,42	4,5	0.06	0.004

The lab results of the soil analysis revealed that the soil contained pH 5 which is low for banana. The optimum pH of 6.5 and pH range between 5,5 to 7.5.

Apart from the above problems the soil is good for banana production. Aluminum and phosphorus are not required in huge amount and the toxicity of aluminum is not a problem for banana production. The soil is well-drained and has high CEC which implies that the rate of chemical weathering is high producing charged-minerals that enrich the soil and both qualities are good for banana growth.

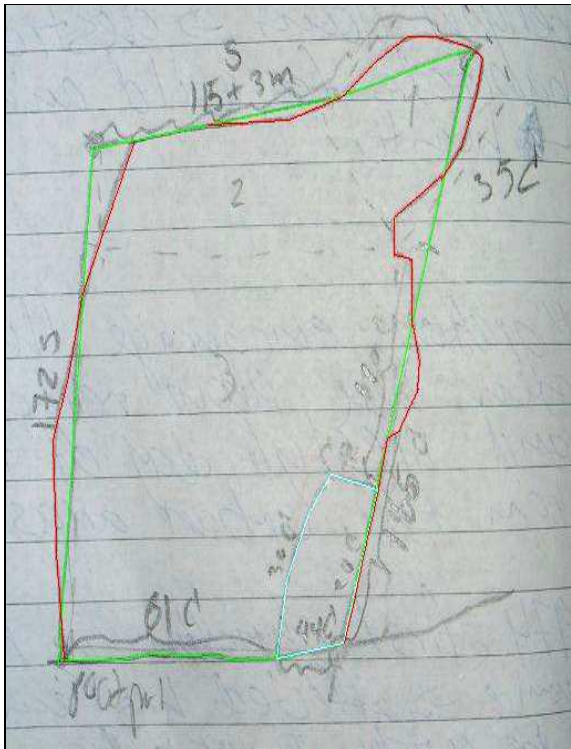
We measured one of the fields we visited on our transect walk. The field was a banana field, which were intercropped with other crops. A part of the field was uncultivated because bedrocks underneath the topsoil prevented cultivation.

We measured the total area which was cultivated equal to: 4040.85 m<sup>2</sup> which is almost 1 acre.

The total area was an average = 4375.25 m<sup>2</sup>

The uncultivated area = 335.4 m<sup>2</sup>

#### Box 4.2



The sketch of the field made in situ. The red line indicates the “actual” size and form of the field, where the green line are the routes walked to measure the field and the blue the area not cultivated.

The measurement was done with string and footsteps:

Christopher; 18.5 steps /10 meter = 0.504 meter pr. step.

Signe; 23 steps /10 meter = 0.434 meter pr. step.

Cultivated area:

A = 52.91m

B = 90.72m

C = 52.92m

D = 74.65 m

Uncultivated area

E = 22.18 m

F = 15.12 m

#### Household

All the selected households have answered that the road provides better access to towns e.g. Kuching and therefore also a better access to market. Most of the households have had an increase in income and production after the road has been constructed. The households mentioned it is easier now to transport fertilizer.

The selected household no. 8 was one of the guides of one of our transect walks. He informed that he had increased his cash crop cultivation in this field after the road had been constructed. He plants bananas because he can sell them more easily. Market price is a factor that affects his choices of crops cultivated. Before the road he planted bananas in a scattered manner just for self consumption. His statement confirms the results from figure 4.2.4, where the road is a factor for selection of cash crops, in this case has it influenced on the selection of bananas as a cash crop.

#### Conclusion 4.2:

The agricultural production has increased after the road was constructed. Cash crops have mainly increased and bananas which according to the villagers are easy to maintain is a very popular crop. The banana production has mainly increased after the

road; this could be due to easier transportation of bananas which can not be storage in the village. Rubber is the crop which gives the best income; the prices on rubber are high now. The market prices are fluctuating and the result is sometimes some crops get abandoned because the prices are falling on this particular cash crop and rising on others.

The capitals which are relevant for the assets pentagon in this section are natural capital, financial capital, and physical capital. The livelihood of the community has been increased after the road was constructed. On a household level not all households has increased their agricultural production after the road, this could be because of health issues or labor shortage because the young people are migrating.

### **4.3 Agricultural intensification and expansion**

Agricultural intensification is in our context when the production increases in the same area of land as earlier either because of fertilizer or other external factors. Expansion is when the cultivated area expands. When increase and expansion of production is used in this section, is it implying after the road was constructed.

#### **Community level**

Our research obtained information about the level of increased production and expansion after the road was constructed. The village headman specified during the key informant interview that after the construction of new road the volume of production has increased, e.g. production of banana has significantly increased which contributed to their livelihoods.

This statement is confirmed by the household questionnaires which provide us with the information seen in figure 4.3.1, that 63% of the 41 households in kpg. Danu has increased their production after the new road.

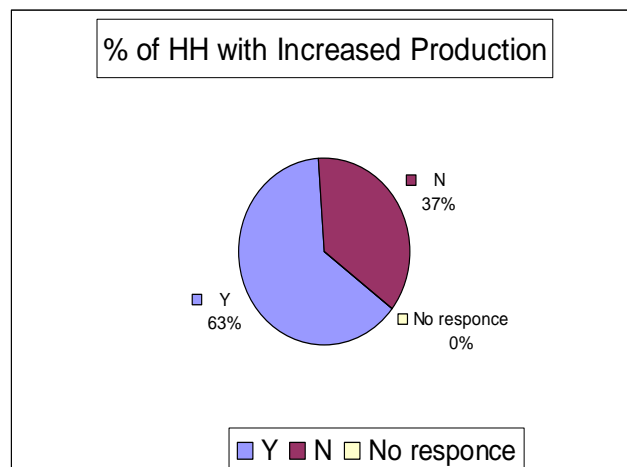


Figure 4.3.1; increased production in the community (%)



*We observed one area, where land had been cleared to make room for new rubber trees. There were already rubber trees in the area and this activity can be seen as an expansion of the area which is probably connected with the rise in prices on rubber.*

There has been an expansion in the areas which are cultivated with the four main cash crops. Figure 4.3.2 shows an expansion in acres used for cultivation, especially the area for banana has expanded after the road. This could be due to the easier access to market, which makes transportation of bananas easier and more frequently. Bananas are not a product the villagers can dry and keep for a while like pepper, cocoa and rubber. Bananas are harvested throughout the year; we were informed during the transect walk and cropping calendar.

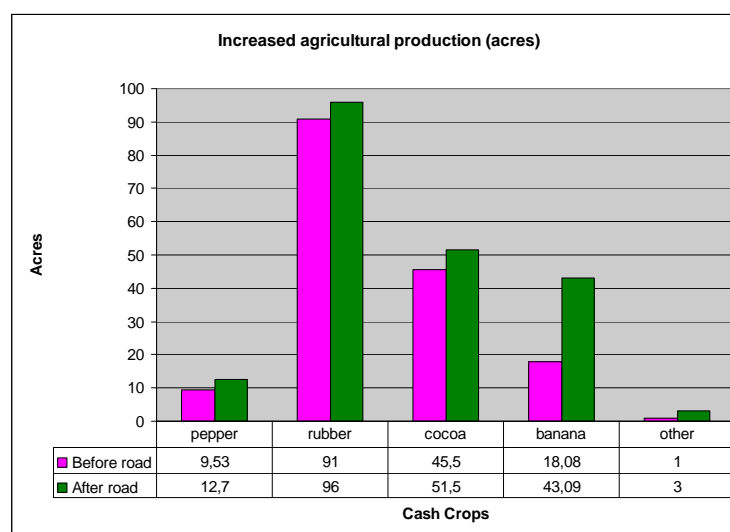


Figure 4.3.2



Figure 4.3.3 shows 61% of the households have expanded their land for agricultural production. It tells us the land resources in Danu before the road was constructed were not a limited resource in the community. 61% of the villagers in the community have been able to expand their land for agricultural production. Natural resources in Danu are therefore not scarce.

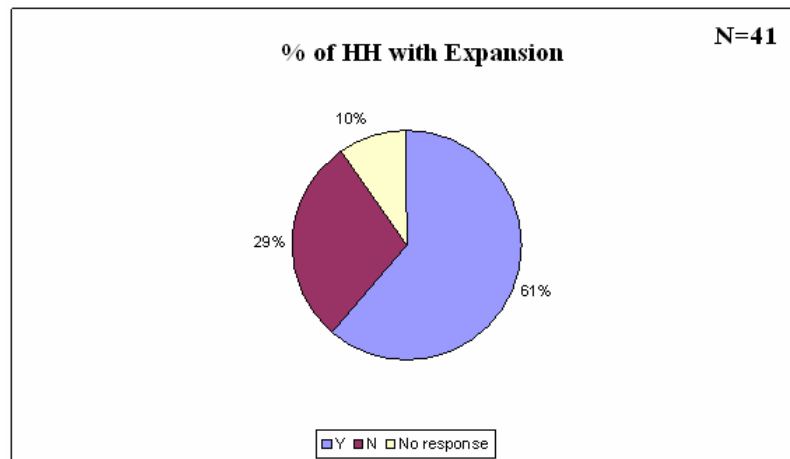


Figure 4.3.3 Expansion in %

The access to markets, provided by new road, could have increased the incitement to apply more fertilizers on more land. Fertilizer can intensify production on a field; when the production are both intensified and expanded the productivity increase even further.

### Household level

The villagers has according to figure 4.3.1 increased their production after the road was constructed.

Each household has a reason to increase production. The questionnaires provided information on which factors influenced the intensification in the household if there had been one. Figure 4.3.4 shows the different factors and their effect. We can see that better market access is a dominating factor for increased agricultural production.



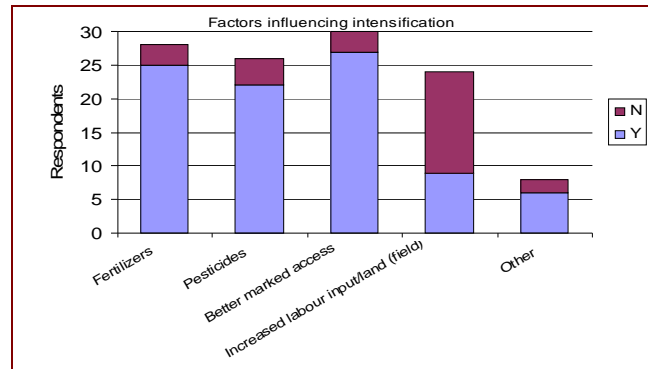


Figure 4.3.4

Other factors of intensification of agricultural production are e.g. maintenance of bananas which are easy; this can explain why the production of banana has increased from 18 to 43 acres in figure 4.3.2 after the road was constructed. The availability of labor has probably not increased, which could mean the villagers have to concentrate on less time consuming agricultural activities.

### Conclusion 4.3:

There has been both an increase in production and an expansion of the cultivated area in kpg. Danu after the road was constructed. Most of the households have increased their production, but not all. Each household has their own reasons to increase production, but the road has the greatest impact on increased production and expansion. The better access to market and easier transportation of crops and fertilizers has been important factors for the opportunity to increase. The road has indeed improved the life in the village. A relevant factor is market prices which influence the crop selection.

The capitals we can consider in the asset pentagon in the livelihood framework are both natural and financial capitals. The better access to market and the intensification of production leads to a higher income in general in the village.

The natural capital is affected by the natural resources such as biodiversity in crops, the availability of land etc. There is a difference on household level and community level, some households has a lot of land available and others do not. Households which are only dependent on off-farm work can still have many acres of land available. This section gives us information which can help answering the first hypothesis and third objective.

#### **4.4 Workforce capability**

In this section will we present the information we collected in Danu about health, age, ability to work, training and education level.

##### **Community level**

Different issues are considered when we look at workforce capability. The issues are education level, training, health and age. We were informed from the cropping calendar exercise in the community that paddy is the most labor intensive crop followed by pepper, rubber, cocoa and banana.

The age structure in kpg Danu is shown in figure 4.4.1 & 4.4.2 below.

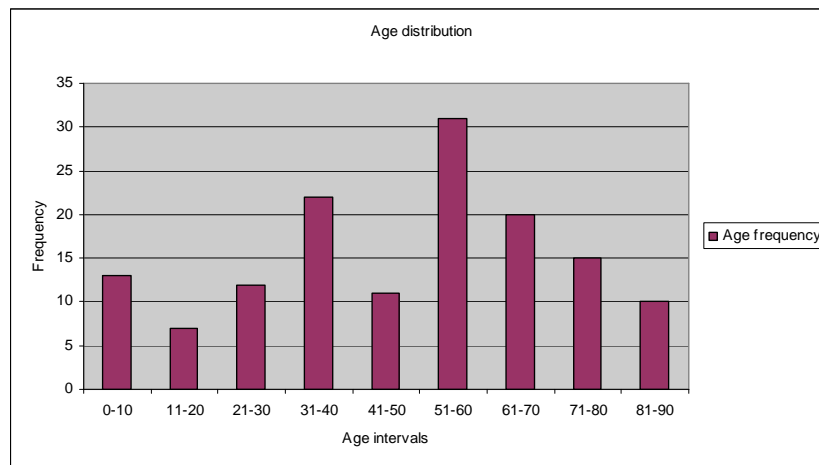


Figure 4.4.1

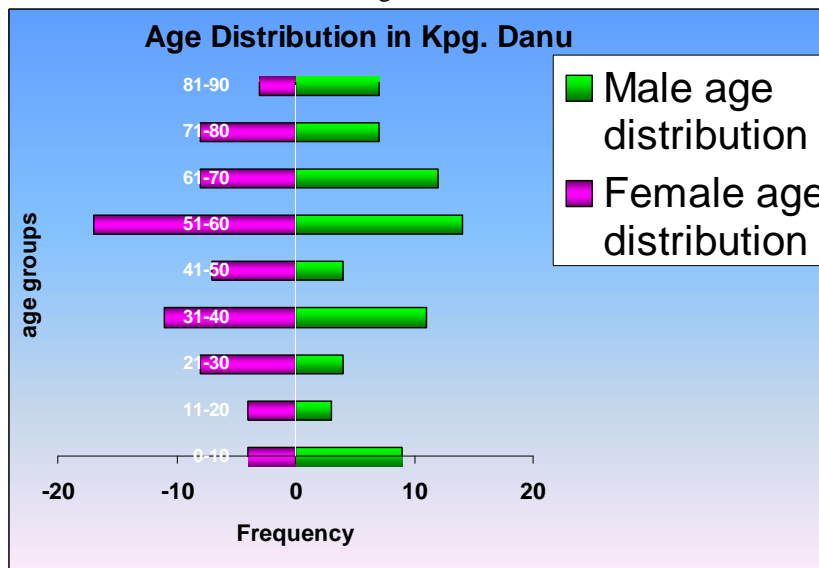


Figure 4.4.2

In the village is the largest age group is 51-60. The large group of elderly people can result in a high scale of age related illnesses. It can have an effect on the workforce

capability in the village. The inhabitants in kpg. Danu do not retire at a certain age like here in Denmark, they work till they are not capable of working anymore. The age can though still have an effect on the amount of work which are performed and which kind of work.

Kpg. Danu's education level is low. The questionnaires have provided us with information about 145 inhabitants education level in the village. Figure 4.4.3 show the education level in the village.

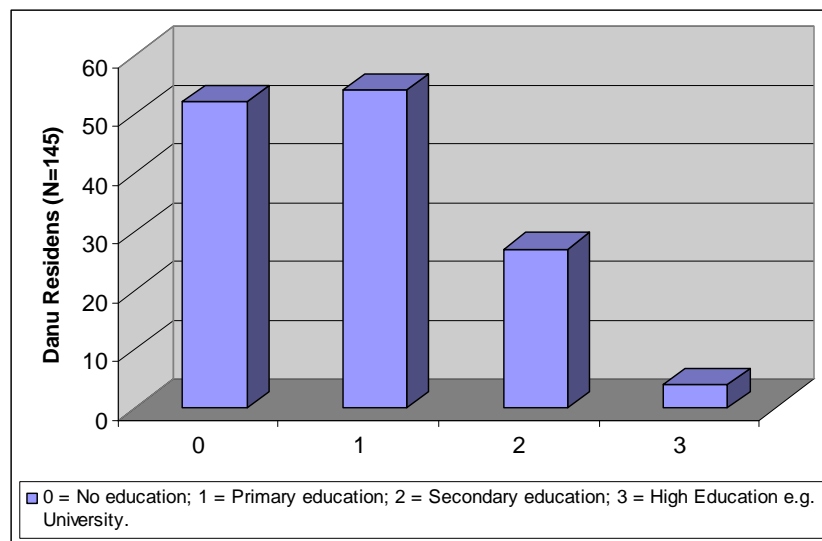


Figure 4.4.3 Education level

The reason for the low education level can be connected to the age structures in the village. Education today has probably a higher status than in the past and gives more opportunities. A raise in education level among the young generation today can be a reason for migration. Information from the questionnaires told us many children of the villagers have migrated because of job opportunities.

We were informed during the key informant interview with the department of agriculture that the village is offered different agricultural schemes. In connection to these schemes are training is offered. The methods used to perform the training are practical demonstrations; this is according to the DoA because of the low education level.

The last issue we have considered is health. We have information from our household questionnaires about the health situation in the village. Figure 3 inform that 34% of the

inhabitants in the village have health problems. This is a high percentage, but there could be age related illnesses in the village. Unfortunately we do not have any information on which kind of health problems they suffer from and if it affects their workforce capability.

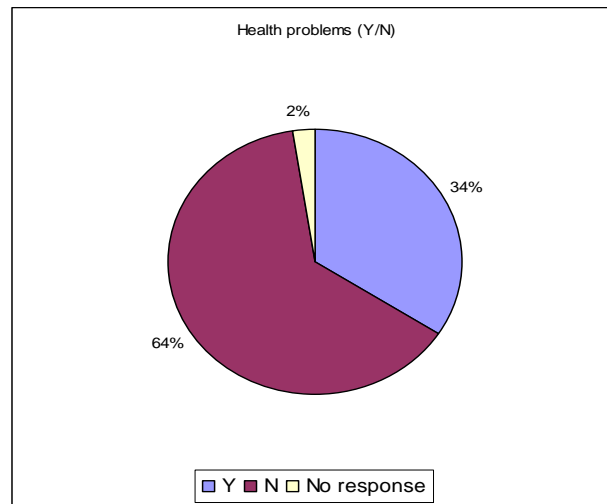


Figure 4.4.4

Health and poverty can also be related. Poverty can lead to health problems because the intake of nutrients and calories are too low. Figure 4.4.5 is a model which shows the connection between poverty, health and income. Poverty can lead to malnutrition, which leads to poor health, which gives a low productivity and a low income. In section 4.1 illustrated by figure 4.1.4 most of the households in the village were below poverty level. If there is any connection between poverty and health in Danu is unknown, but it could be assumed there was a connection. The observations in the village were some of the villagers seemed underweight and skinny, but we have no information about a connection.

**Diagram 1 : The Vicious Circle Of Poverty**

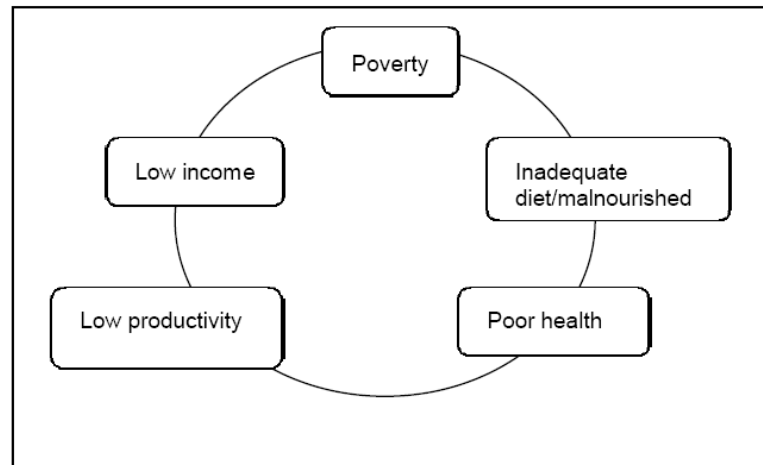


Figure: 4.4.5; (source: <http://www.icu.gov.my/pdf/sabah.pdf>)

### Household level

The questionnaires informed us about the number of the residents who participated in the agricultural activities.

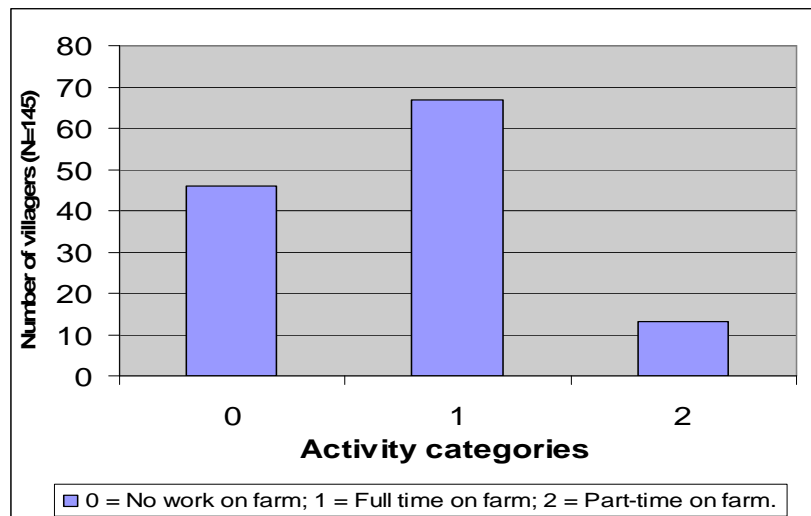


Figure 4.4.6

Looking at the figure 4.4.6, we can see 46 villagers out of 145 are not working with agriculture. This means they are either having another job or are not working. This can be due to retirement.

The semi-structured household interviews provided us with information about access to health services. All the households informed the road had lead to a better access to

health services. It is much easier than the time when the villagers had to sail to get to health services. The easier access also means some of the households use health services a lot more than in the past, here is taken into consideration the possibility of new health situations in a household.

Figure 4.4.7 illustrates the households which are having health problems and their income. The figure can be used together with the vicious circle of poverty (figure 4.4.5) and can give an idea if there are any relations between poverty and health in the different households. 11 of the 14 households with health problems are below the poverty level; this could be a possible connection between poverty and health. This could support an assumption about a link between poverty and health, but we have not the right information to make any conclusions.

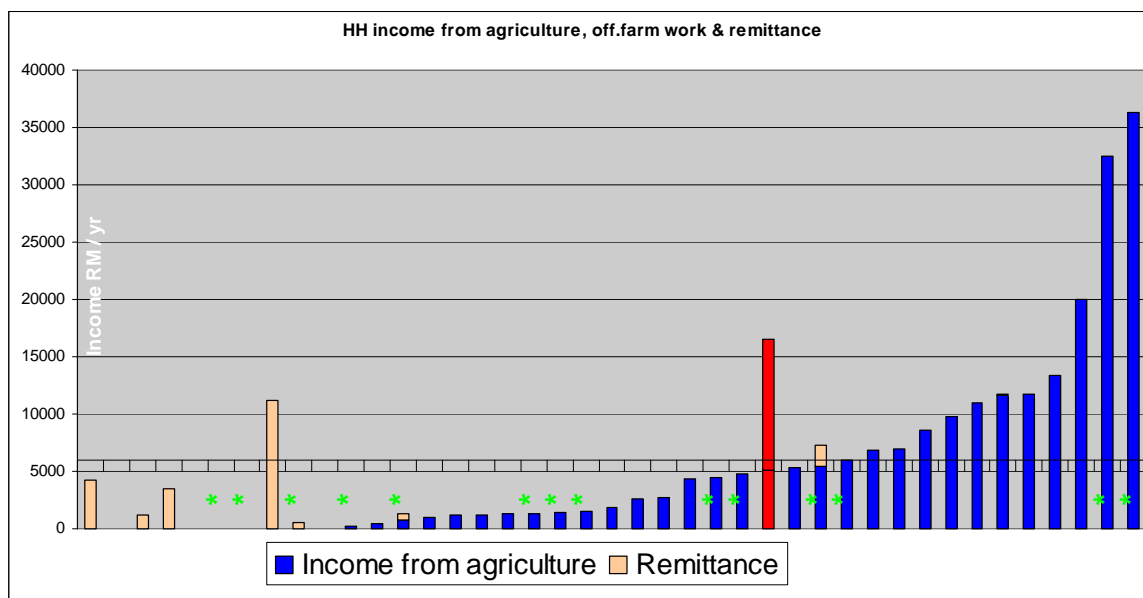


Figure 4.4.7: The green points are the households with health problems.

Training is provided by the department of agriculture. Information from the semi-structured interviews shows a difference in received training within the households. Four of the seven households which work with agriculture have received training. Not all of the households have received any training recently.

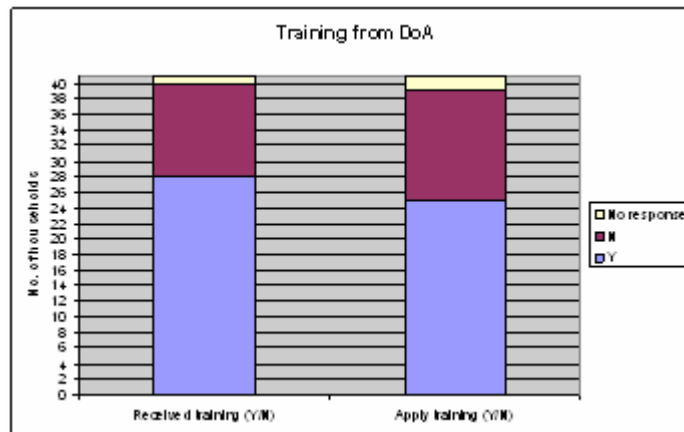


Figure 4.4.8

The figure above informs from the questionnaires about the number of household which has received training and how many are applying it to their fields. A quite large percentage applies the training to their fields.

Training gives a possibility to increase a household's production by using different agricultural methods. Traditionally and inherited methods can though still be a factor which undermines the new methods taught by the agricultural department.

#### Conclusion 4.4:

We can conclude the average age is high in kpg. Danu, this can affect the ability and capacity to work. Especially with agriculture which are a demanding job for the body's physical condition. The percentage of people who has health problems in the village is high, but this can be connected to the high average age within the village. Education and training are very individual within the households. Not all households have received training in agricultural practices and not everyone is using their new skills.

We can consider in the human capital in the assets pentagon in the livelihood framework in this context. Labor, health and education are all a part of the human capital, which can lead to an improvement in livelihood strategies if the capitals in the livelihood framework are increased.



#### **4.5 Role of DoA on agricultural activities**

In this section are the results, analyzes and discussions presented from the data and information we gathered from different sources in connection with the role of DoA on agricultural activities on kpg. Danu. We present the results into community level and households' level.

##### **Community level**

The PRA Venn Diagram shows that the DoA has great influenced on agricultural activities in the community. The area of intervention indicates the weight of the influence of the DoA towards the community. Figure 4.5.1 show that the greatest external factor which influences the community comes from DoA, followed by the market, then the middleman in Bengoh.

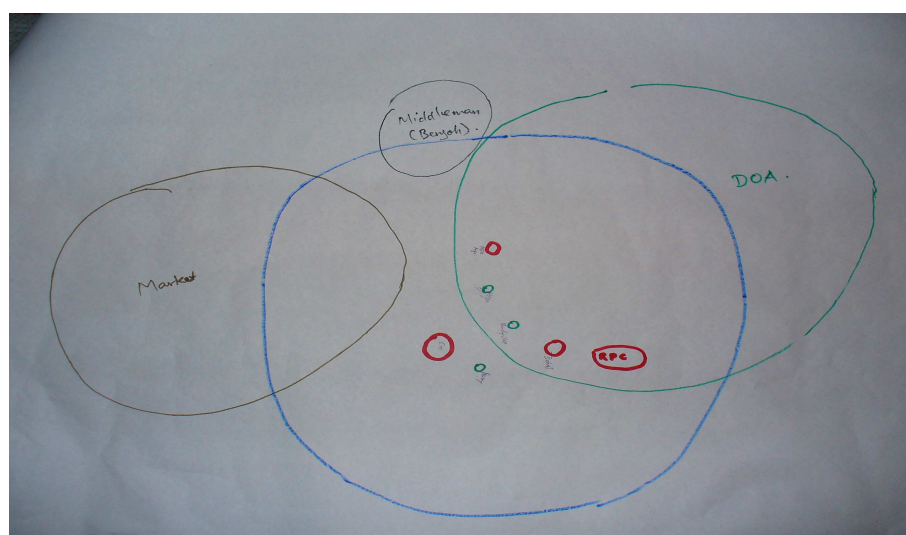


Figure 4.5.1; Venn Diagram showing relationships between DoA and the community.

The village agricultural representative informed us about the overall organizational diagram of the village committee. DoA work together with the community as a unit see figure 4.5.2. The DoA informs the village agricultural representative by sending formal letter about new schemes, training, inspection period, etc. The agricultural representative joins meetings with DoA occasionally. The agricultural representative informs the villagers about the new schemes and when to apply for them.

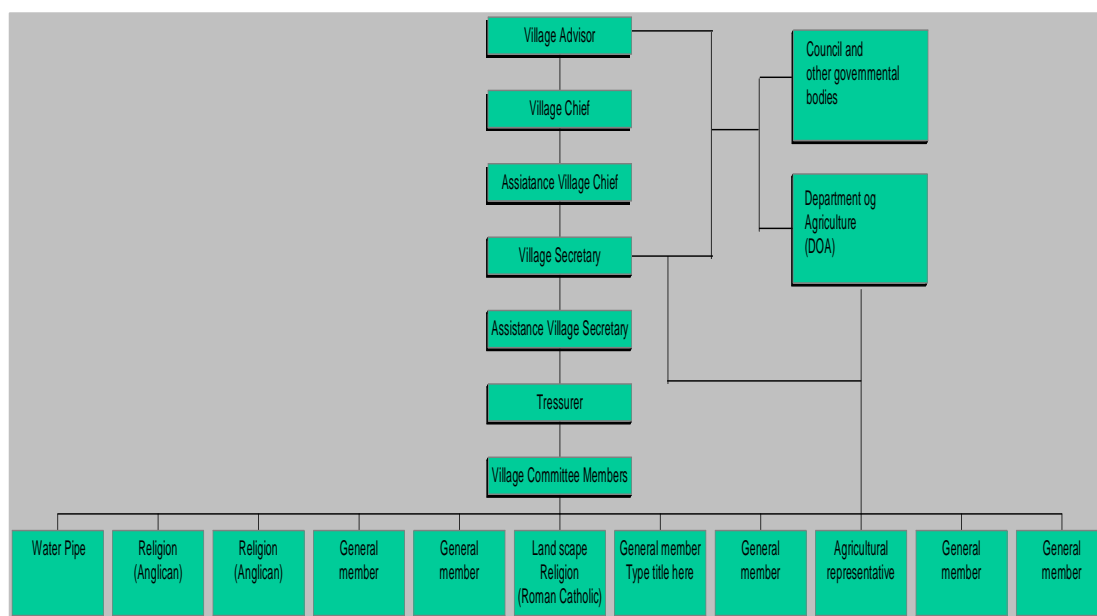


Figure 4.5.2: Hierarchy in agricultural system in kpg. Danu

The village agricultural representative of kpg. Danu informed us about the role of DoA on agricultural activities in the community. The following figure 4.5.3 presents the hierarchy in agricultural system in kpg. Danu. The DoA informed us they conduct surveys in the area before they conduct a scheme. When they have conducted a survey they make suggestions for new schemes; these moves further up in the political system to get approved. When a scheme is approved it is introduced to the village.

The schemes below in the Box 4.5.1 are provided by the headman and contains DoA's influence on agricultural activities in the village. There are differences in the information we have gathered from the headman, village agriculture representative and DoA.

#### Box 4.5.1: Agricultural schemes provided by the DoA in kpg. Danu

##### Rubber Scheme

The Malaysian government declared a scheme called Malay Rubber to encourage farmers to plant rubber in 1959. The rubber planting was started in 1960 and government provided subsidies in terms of fertilizers, pesticides, seedling and planting equipment such as wheel barrel etc. The government also declared to pay RM 45 per acre for the first 3 years who will plant rubber. But after 1963, the villagers are required to apply to DoA for subsidies mainly fertilizers if they would like to plant rubber.

**Pepper and Cocoa**

The pepper and cocoa schemes were started in 1987. At the beginning of the schemes, the DoA provided all facilities such as fertilizer, pesticide and wheel barrel to the farmers. The DoA provided subsidies for 8 households at the beginning but later sometimes they provided less or more households depending on the availability of the fund. The selection procedures are on rotation basis. Currently the farmers get subsidies in the form of fertilizers.

**Banana**

The farmers of kpg. Danu received subsidies to plant banana from 1997. The DoA provided subsidies to every household except those who do not have land and/or labor. The subsidies provided by the DoA to kpg. Danu can be seen below in table 4.5.

**Table 4.5.1: Subsidies for banana scheme to kpg. Danu**

<i>Subsidies</i>	<i>Amount</i>
Fertilizers	26 bags/ 3 years (1 bag = 50 kg)
Pesticides	24 gallons/ 3 years for maintaining grass in the
banana field	(1 gallon= 4 liter)
Spray machines	2 machines per 3 years
Seedling	According to the needs

The DoA informed us about schemes they have had in kpg. Danu. There was only one scheme present at this moment and it is the banana scheme. The schemes we were informed about were the schemes in box 4.5.2. The villagers get subsidies often in form of fertilizers. In some schemes like the banana scheme the department of agriculture gives planting materials for the villagers who needs it. The villagers who already have banana plants don't get it.

**Box: 4.5.2**

Pepper scheme in 2001-2005 (8<sup>th</sup> Malaysian plan)  
 Cocoa scheme 1996-2000 (7<sup>th</sup> Malaysian plan)  
 Banana scheme 2001- 2005 (8<sup>th</sup> Malaysian plan)  
 Rubber scheme (6<sup>th</sup> or 7<sup>th</sup> Malaysian plan) (1990-2000)  
 Vegetables scheme Annual basis

The village agricultural representative informed us about the current situation of the agricultural schemes in kpg. Danu. The following table 4.5.2 illustrates the information about the different agricultural schemes and selection criteria collected through an interview with village agricultural representative.

Table 4.5.2: Current agricultural schemes, subsidies, selection criteria provided by the DoA to kpg. Danu

Year of the scheme started	Name of the scheme	Number of household in the scheme	Selection criteria	Households selected by	Subsidies/training	Total year of subsidies	Transportation facility
2005	Banana	18 (25 <sup>5</sup> )	<ul style="list-style-type: none"> <li>• Group scheme</li> <li>• Labor (in terms of health)</li> <li>• Field maintenance criteria</li> <li>• After inspection conducted by DoA</li> <li>•</li> </ul>	DoA	<ul style="list-style-type: none"> <li>• Fertilizer 25 bag <sup>6</sup></li> <li>• 16 gallon<sup>7</sup></li> <li>• Wheel barrel (2)</li> <li>• Seedling (100 per farmer)</li> </ul>	First 3 years	Having sent notice to the village committee agricultural representative, the DoA delivers fertilizer and other agricultural items with their transport services for free
There are currently no rubber schemes in kpg Danu							
Can not remember (old scheme)	Pepper	15 (2005) (>20) 12 (2006) (>20)	<ul style="list-style-type: none"> <li>• Field maintenance criteria</li> <li>• Labour (in terms of health)</li> <li>• Depend on DoA budget</li> <li>• After inspection conducted by DoA</li> </ul>	DoA	<ul style="list-style-type: none"> <li>• Fertilizer 10 bag</li> <li>• Pesticide 8 kg (powder)</li> </ul>	Application required.	Same as above
Can not remember (old scheme)	Cocoa	>15 (2005) (>20) >15 (2006) (>20)	Same as pepper	DoA	<ul style="list-style-type: none"> <li>• Fertilizer 6 bags</li> <li>• Pesticides 0.5 liter*6 bottles</li> <li>• Seedling (only at the beginning of the scheme)</li> </ul>	Application required.	Same as above

<sup>5</sup> Number of applicants applied for scheme

<sup>6</sup> 1 bag = 50 kg

<sup>7</sup> 1 gallon = 4 litre

### Households level

In the Venn Diagram, the participants showed the degree of importance DoA has in their life (Figure 4.5.1). DoA has a big influence on the life in the village. The reason could be that the DoA provides a supply of fertilizers, pesticides, seedling as well as training.

Without this, the villagers might not be able to produce as many and as quality agricultural products. The consequences of this could be difficulties with selling the products. There is a big difference between the households about how big an influence the DoA has. The households who are participating in the banana scheme are more influenced by DoA than households which are not participating. Figure 4.5.3 and 4.5.4 show how many households in the village and which of the selected households are participating in the banana scheme.

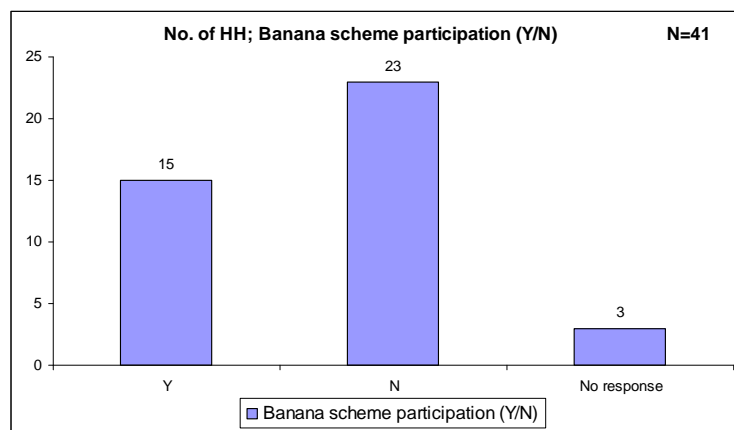


Figure 4.5.3

The headman informed us that the banana scheme is a governmental full-scale subsidies scheme. Results from questionnaires shows 15 of the households in Danu are participating in the banana scheme.

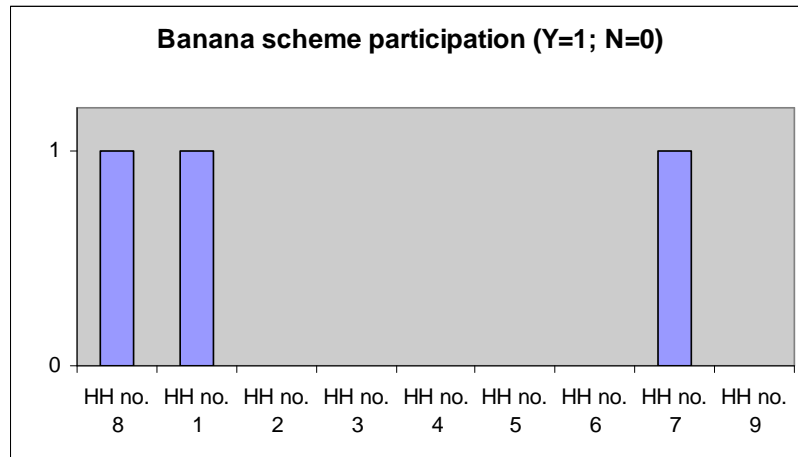


Figure 4.5.4: Selected households participation in banana scheme

The DoA's role on the different households are different within the selected households. The off-farm households are not affected, but the rest of the households have a possibility to be affected by DoA. Almost all the selected households have applied for the banana scheme, but almost a few is participating. The households which are participating are not the poorest households which could be the ones who needed the schemes. This can be confirmed if we look at figure 4.1.6 in section 4.1 that show which of the selected households income there are below the poverty level. Household no. 7 is having the highest income of the 9 selected households. Even though household no. 8 below the poverty level, the observations made in his house by the interviewers is not showing this picture, so there might be some misleading factors involved here.

Household no. 9 added he is not a part of the banana scheme; he did not get a chance to apply because the headman did not inform him about the scheme. He does not know why he did not get informed about the scheme. He would have applied if he knew about it.

The aim for DoA is to get the households above the poverty level. The criteria DoA sets for a household can participate in one of the schemes are:

- Have land
- Be hard working and obliging
- Be a member of a farmers organization
- Head of household
- No land disputes
- Land need to be suitable for planting crops
- Survey to see if they are genuine farmers

#### **Conclusion 4.5:**

The analysis of the findings above show the DoA has a big influence on the village and the villagers. The villagers in Danu which are a participating in the banana scheme are dependent on the fertilizer and other subsidies they get from DoA. The scheme is a full supply scheme of fertilizers and therefore a popular scheme. If the schemes are always going to the households who is in the biggest need for support are unclear. A lot of the households with a high income which are over the poverty level are participating in the banana scheme. This is a bit contradictory because we were informed from DoA that the main goal was to get people above the poverty level. There could possible be some conflicts of interest if there are any personal connections (nepotism) between the DoA and some of the villagers, when they collect the participants for the schemes. At community level there could be some conflicts of interest from the agricultural committee in village e.g. to who and how they inform the villagers and if they make sure they inform everyone.



**BOX 4.5.3:**  
**Rubber tapping**

The kpg. Danu villagers prefer to plant rubber during the rainy seasons as the wet season will encourage growth of roots. It takes 7 to 10 years of maturing before tapping can begin. To tap rubber you have to cut the tree with a special knife, which is shaped in such a way that it only peels of the necessary part of the bark. If cut too deep the tree will get damaged and vulnerable to fungi. Each tree gives between 1-5 dl rubber fluids per day. The peak latex producing month is in October.



#### **4.6 Future usage of electricity**

In this section we have tried to prove our third hypothesis and answer our sixth objective. This section is different from the above sections because we are working with a future perspective, which means we can not work this chapter into a context before and after the road.

#### **Community level**

During our first meeting with the villagers in Danu, we were informed about the need for electricity in the village. The headman also mentioned this problem during his key informant interview. He gave us a story about generators provided to the village by the government, see box 4.6.1.

The village applied for public electricity supply to SESCO in 1997, but they are still waiting to receive the outcome of the application. The headman informed us that kpg. Danu is the only village in the area without electricity.

#### **BOX 4.6.1: Electricity**

##### ***A short history of generator in kpg. Danu***

- During 1982 and 1983 kpg. Danu received a generator from the local government
- Due to the operation complexities, the generator was no longer functioned
- After that the government provided another generator to the village in 1997
- Unfortunately, the second generator was also not functional
- The government budget for the generator was RM 10,000 but the contractor bought the generator of RM 3,000 that was made in China, they found
- After that incident, the villagers were not satisfied and decided to buy their own generators
- The village committee applied for electricity supply to SESCO (Sarawak Electricity Supply Corporation) in 1997

As mentioned earlier we have lost timeline data, but it has still provided us with some information about the village; e.g. there are frequently floods in the village which are coming from the Kiri River.

This could be one of the reasons why the government has decided not to fund an electricity supply to kpg. Danu as the only village in the area.

It can be a problem to lead a cable to kpg. Danu, because the floods prevent that a cable can be drawn underneath the bridge. The cable has to be under ground or led over the Kiri River in the air.

Another reason could be that the road which leads to the village first came recently. This mean would have been a problem to transport materials. Before the road was build, was the main problem in Danu probably the new road. This confirms a development in the area and problems are not static.

### **Household level**

Everyone in the semi-structured household interviews answered that a supply of electricity would influence their living standards. The main use for the selected households was household usage which is also confirmed below in figure 4.6.1, which shows the answers from the different households.

Household no. 4 added he would use a 24-hour electricity supply in his shop, which would have a big effect on his life. He could be able to sell more products as meat and ice cream. Household no. 5, 7 would like to use a supply of electricity for storage of agricultural products, especially bananas. Household no. 6 would like to use electricity for agriculture, but did not know how.

The headman informed us there are 36 individual generators in the village and the villagers who can not afford a generator often get a connection by paying from their neighbors. Household no. 9 mentioned the price on petrol has increased recently which gives worries.

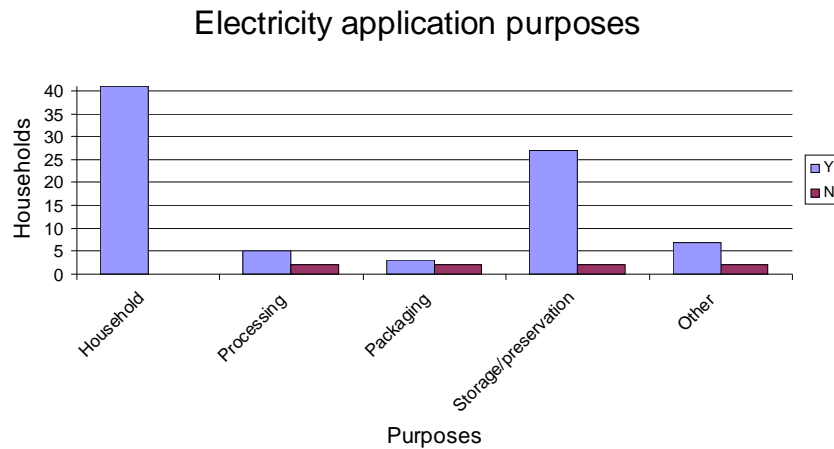


Figure 4.6.1

The figure above shows the results from the household questionnaires which confirm the knowledge we have from the semi-structured household interviews. Most villagers would like to use electricity for household purposes and a few households for agricultural uses and other things for their business.

We can question if any of the villagers will use electricity for processing and packing because it would have costs to develop. Storage would be more realistic if the villagers could fund a storage place together, but on the other hand would it probably decrease the middlemen's income, because most of the villagers sell their bananas to them. Bananas are a cash crop which need storage. The middlemen in the village have a big influence, one is the headman and the other one is shopkeeper and have a large income compared to the other villagers (see 4.1).

The analysis of the usage of electricity shows there is a need/demand for electricity supply in the village.

#### **Conclusion 4.6:**

We can conclude there is a need for electricity in kpg. Danu. The use of generators can be during all day, because it is too costly and the generators have different disturbing effects e.g. noise. On a household level is the need for electricity for daily use e.g. washing machines, rice cookers, refrigerators etc a big problem for the villagers.

To answer our third hypothesis we have tried to link our research to the sustainable livelihoods framework. The data upon which the issue about electricity is built is speculative, but it provides us with an idea about the village/villagers need.

Electricity is a physical capital in the livelihood model. To assess if electricity will bring better livelihood to the villagers, we have to look at the physical capital and transforming structures and processes.

The physical capital will be larger if the villagers got access to public electricity supply. The larger amount of physical capital would probably influence the trust the villagers have to the government. These factors would change the villagers' livelihood strategies and lead to a better income, better well-being and a reduced vulnerability. We can conclude that electricity most likely will improve the villagers' livelihood, which prove our third hypothesis.

## 5. Livelihood strategies

In this section we will try to collect the data from our analysis and put it into the sustainable livelihoods framework. We will mainly look at the pentagon assets and see if the room for maneuver has improved on community level since the road was constructed. We will chose some of the selected households and estimate their room of maneuver in the assets pentagon. After we have estimated if there has been an improvement in the capitals we can analyze if the livelihood strategies has changed and if the village and villagers vulnerability context has decreased.

### Community level

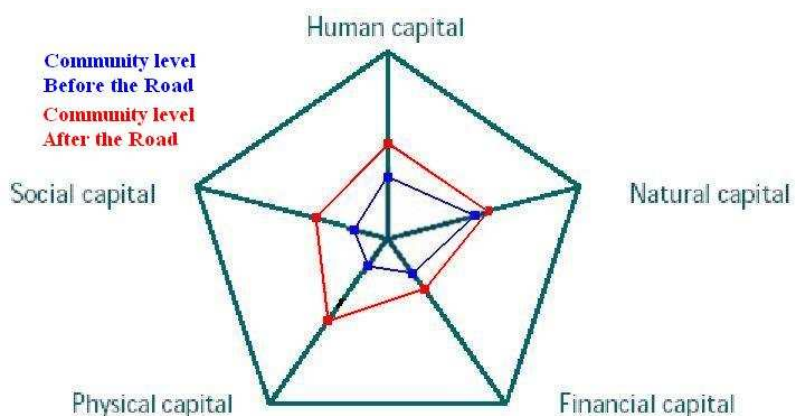


Figure 5.1.1 Pentagon assets on community level

The blue line in the asset pentagram indicates the capitals on community level before the road. The physical capital is low, because the access to and from the village was limited to the river. This meant that transportation possibilities were limited. We can see at the pentagon that the physical capital has improved significantly after the road was build. The capitals in the assets pentagon have an influence on each other e.g. when the road was build the other capitals raised. There can be situations where a raise in one capital can have a negative effect on other capitals. An example could be an increase in physical capital like in Danu which could have an effect on the availability of labor in the village, because people are migrating and are applying for jobs in the towns where the salary are higher and more stabile. There is still a need for improving the physical capital in the village as cars cannot cross the river and more than half of the road is still gravel.

The social capital before the road was low because the physical constraints restricted access to institutions such as DoA and social networks as family outside the village. We know from the timeline that the road was constructed in more than one phase. It was not completed because of limiting funding. After the election in 2000 the road was completed. We can assume the trust to political institutions have increased after the road was constructed.

After the construction of the road the financial capital has increased, because the income from agriculture has increased in the village. The capital is however still low, due to the fact that more than 50% of the households live under the poverty line determined by DoA.

The natural capital has not improved much after the construction of the road. The land size available has not changed. The cultivated land has expanded and there is a possibility for a large diversity in crop selection due to market access.

The human capital was low before the road was constructed. The access to health services was difficult because the only transportation possibility was the river. Education was another problem because the school in Danu was closed in 1983. School children had to attend boarding school from a young age. Today it is easier to transport the youngest schoolchildren back and forwards. We can assume this increases the incitement to attend school for the youngest children.

We can conclude the community's livelihood has increased after the road has been constructed. This has an effect on the vulnerability context in the community which has improved. The livelihood strategy in the community has changed because of an increase in capitals which gives a larger room for maneuver.

### **Household level**

There is a big difference between the households in the available capitals/access to assets. There will be an analysis of the three selected households in this part. The available capitals will be used in the assets pentagon. One household from each of the selection criteria group will be analyzed. Within the three groups can there be big differences in the available capitals; we have chosen to take one from each selection group even though it does not show the differences within the selection groups. In the group where the production has increased after the road is it household no. 7 which will be analyzed, in

the group with the same production is it household no. 5 and in the off-farm group is it household no. 4.

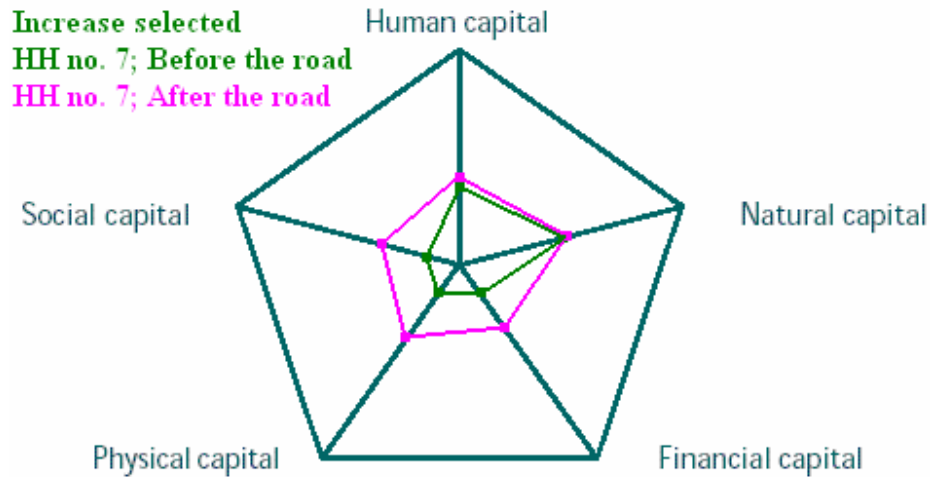


Figure 5.1.2: Selected increased household pentagon

The above pentagon shows household no. 7 available capitals. The pentagon illustrates an increase in physical capital which is due to the new road. The transportation of products and fertilizers has improved and the easier access to market has an effect on how much the household can produce and sell. The improvement has an affect on the financial capital which has risen too. This is because of the increased production mainly; the household also receives remittances, but nothing regularly. The household is participating in the banana scheme which influences their financial and social capital. The financial capital is affected by the subsidies the household receives and the social capital shows the better access to institutions. DoA has made follow-ups on the households fields, before the road the villagers had to pick the officers from DoA up in Bengoh by boat which were time consuming. Now they can use the time in the field instead. The social capital has also improved because the access by road allows the household to see their children more often. The children are working in town. The human capital is almost the same, the situation has not changed in the household, but there is a better access to health services and education institutions if needed. The natural capital is almost the same as before the road, the land size available is the same even though the household would like to expand, but they do not have any more land. The diversity in crops has increased a bit; they have banana fields now which they did not have before the road. The livelihood in this



household has increased a lot and the road has had an impact on the livelihood strategies in this household. Their vulnerability context has decreased and the household would easier be able to cope with external stress.

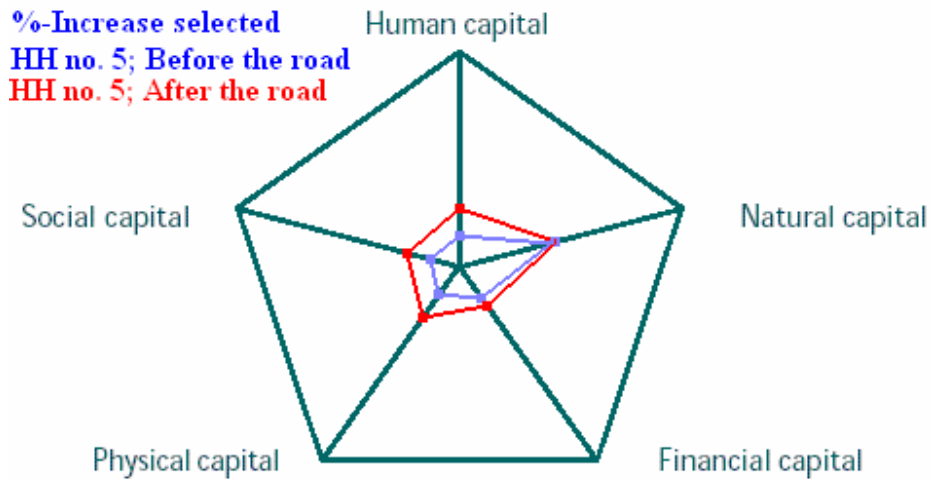


Figure 5.1.3: Selected household with same production pentagon

Household no. 5 has the same production now as before the road was constructed. The room for maneuver are compared to the household no 7 low. Household 5 has a low financial capital and their income is below the poverty line (see figure 4.1.4). The road has given a better access to market according to the household, but they have not increased their production, which could be because they can not afford fertilizers if their income is low. Almost like the vicious circle of poverty (see figure 4.4.5) where there is a link between poverty and health. If we look at household no. 5 this could be a possibility because they answered yes to health problems which affect their human capital. The vicious circle of poverty shows how poor people are stuck in poverty because they can not afford or find the strength to get out of this cycle. The cycle is mostly based on malnutrition, but with a small twist in a direction where financial capital also plays an important role could this cycle be reality for many of the villagers below the poverty level in kpg. Danu. The pentagon shows the natural capital is the same as before the road, the household still has 10 acres of land and use the land as before the road. The human capital has increased because of the better access to health services which are used frequently in the household. The household has no education and the age is high so the human capital is not high, but it has improved. The social capital has increased because

the children of the household come more often. The household does not participate in the banana scheme so the influence and need for access to institutions are not that important. We can conclude the road has had a larger impact on household no 7 livelihood if we compare the two households. The room for maneuver has improved a bit for household 5 but not much. It improved the ability to cope with stress, but household 5 is not capable of coping with stresses to the same extent as household no 7.

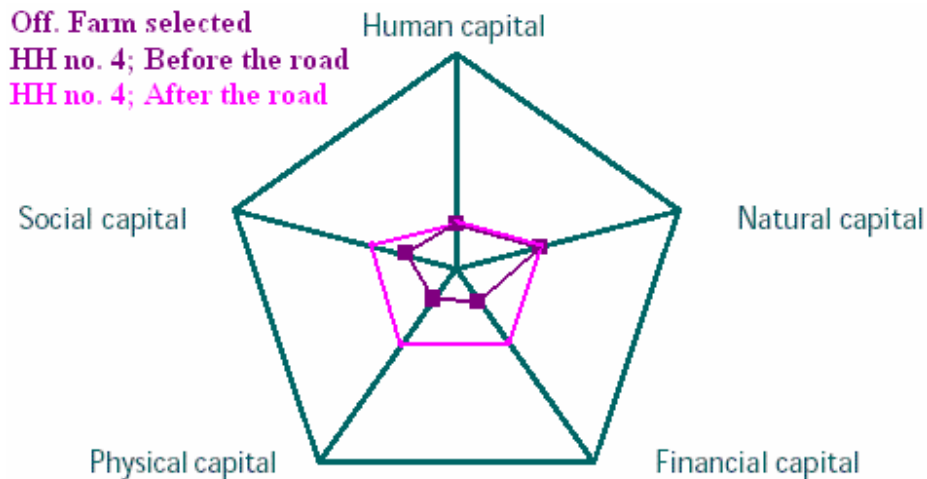


Figure 5.1.4: Selected household off farm pentagon

The pentagon above illustrates a large improvement in room for maneuver. Household 4 has a sundry shop, which they have owned for ten years. The physical capital has improved a lot after the road was constructed; it is easier to transport goods to the shop now, before it was done by boat. This has increased the supply in the sundry shop. Even though the household sells less than before the road, they sell more different goods and they have possibility to go to Kuching to buy goods for the shop. This has lead to an increase in their income consequently the financial capital has improved. In addition to the increased income the household receives remittances.

As the pentagon shows has the social capital improved a bit, the household feels the road has improved their lives because they are able to see their children more often. The human capital is almost the same as before the road. There is a better access to health care and schools, but the household is high at age and has no health problems. The access to health services gives them security in case of emergency situations and illnesses. The natural capital is not important to the household; they have 20 acres of fallow land, which has not changed after the road was constructed.

The livelihood for household no 4 has improved significantly after the road was constructed. This has affected the household's livelihood strategies which have resulted in security in their life.

Compared to the two above mentioned pentagons can it be seen household no 4 and 7 has had a great impact on their livelihood strategies after the road was constructed. Even though the two households are from different selection groups is it the same capitals which have improved significantly in the two cases. This is probably because the road is linked to better transportation possibilities and therefore better access to different things. The conclusion is there is a difference within the households' livelihoods and how much the road has affected the different households. There is no doubt all household has been affected by the road but to a different degree.

## **6. Conclusion**

The conclusion consists of the results found in our analysis and discussion of our data. Our main results are connected to livelihoods in Danu. We have in our analysis found electricity is a limiting factor in kpg. Danu. There is no public supply of electricity in the village which affects the villagers' livelihoods. A supply of electricity would improve the villagers' livelihood in different ways. They would be able to have storing facilities which could affect their income. Electricity could also give access to use of computers which could lead to a use of the internet; this could increase the knowledge in the village and lead to an increase in human capital. Our third hypothesis can be true, but it is impossible to say because it is a speculative matter and the electricity is not yet supplied to Danu. We can though conclude there is a big possibility that electricity will bring better livelihood to the village.

To answer our main research question we have looked at how the road has impacted the livelihood strategies. The road has improved the livelihood in the community, because the road has created an access to different assets. There is a better access to market now which has an affect on the income in the village. This was illustrated in the assets pentagon in the analysis in the financial capital. The financial capital is the one which has been most effected by the new road except for the physical capital. The road has

improved access to town, which means there is an improved access to health services, schools, institutions etc. The road has increased the agricultural production in the village and in most of the households. This is due to transportation which is a lot easier now and the easier access to market, where the agricultural products can be sold.

The agricultural practices in the village has been intensified and to some extent expanded after the road was constructed. This has lead to an increase in cash crop production.

Rubber is very popular because the prices are high. Banana has become a popular cash crop after the road was constructed, mainly because of access to market. There are no storing facilities in kpg. Danu for bananas because there is no public electricity supply. The possibility for transportation also influence the crop selection in the village e.g. bananas.

We can conclude our first hypothesis “The new road has increased sources of income from agricultural productions”, has been proven when we look at community level. At household level the hypothesis has been proven in most cases except from the households who have no farm income. Households with the same production as before the road have an increased income, because the access to market and sale of agricultural products are easier.

To prove our second hypothesis we have to look at other issues than agriculture and income. The human capitals in the village we have looked at is age, health, labor, education and training. The access to health services and schools has improved significantly after the road has been constructed. This has an effect on the livelihoods in the village and in the households. The access gives a possibility for better education and it can improve the workforce ability, because the access to health services has improved so illnesses will be treated to a greater extent. A good health gives a better and more reliable workforce.

The better access to town has improved the family networks in the village. It is easier to visit relatives in town and other villages now and opposite.

We can conclude the road has lead to an improvement in the different capitals; this improvement leads to a bigger room of maneuver. Together with structures, which are external factors as e.g. DoA in this case, the capitals influences people’s choice of livelihood strategies. The livelihood strategies have some outcomes (see figure 2.1.1),

which are an increased income, increased well-being and reduced vulnerability. These outcomes are increased in Danu after the road has been constructed. The income has increased as well as the well-being in the village. This is both on community and household level. The villagers have also a reduced vulnerability against external stresses in the society. External stresses could be change in employment possibilities which will be easier to cope with when the income from agricultural activities has increased. It could also more directly be a fall in prices on agricultural products on the world market. We can conclude the second hypothesis is proven both on household and community level. The road has brought better livelihood to the villagers even though there are differences within the households. Some households have been affected more by the road than others, but every household has to some degree had an improvement in their livelihood.

## **7. Methodological issues**

The data we obtained from different sources by applying different methods might have some degree of risks of validity and reliability. This section presents some reflections we experienced in this process.

A reoccurring problem in the interviews and other fieldwork methods applied, were that we had not prior to the execution fully discussed in the group, how and to what broader purpose they should be performed. Another issue in the interviews and questionnaires were that some of the questions did not apply to all respondents. Consequently and in connection to the above mentioned problems of communication within the group, some questions were skipped inexpedient.

Because the questionnaires were based on closed-ended questions, we were unable to capture any qualitative information from the households' questionnaires except own observations.

In the beginning the villagers were reluctant to participate, because they felt inapt. This was e.g. observed when trying to do the Venn diagram. We tried over several sessions on separate days to make it work. A weak point of the PRA was that it only provides us with an impression of the person's preferences "here and now", so there is a risk that information could be outdated very quickly.

Data analysis issues are especially evident in the presentation of data gathered from the questionnaire. The primary issue is that the information concerning household income is based on several assumptions. The question on income sources were formulated in such a way that the interviewer could write to information in the "volume" of "local unit". This meant that the data e.g. include amount of food, yes and no answers, kg/month and kg/yr. Then the information based on kg/yr or -/month were subjected to the known local prices and marked prices. The additional information have not been directly included in the presented graphs, tables and figures.

There are several other issues that could be touched upon regarding the questionnaires including the calculation of acres of cultivated land. Under land tenure and land use issues we have received information on the amount of land cultivated. The respondents

were suppose to provide information on the amount of acres cultivated, but told how many tress were planted in a grid of i.e. 10x10 feet, so we had to estimate the area size based on simple calculations.



## **8. Cooperation with Malaysian counterparts**

When we met the Malaysian counterparts we had to find a common proposal for the research. We had a good interaction in the group even though we had different working cultures. The Malaysian counterpart had chosen a team-leader before we arrived to Malaysia which was very different from Danish culture, but the team-leader was a very open-minded and flexible which gave the group good opportunities to have a good learning process. The Danish part of the group was very dominating in the procedure. We were four talkative persons which gave an unequal distribution of expressions of opinions. Later in the process this inequality was equalized, but there was still a difference.

The Malaysian counterparts had some tasks they had to do because they also had an environmental impact assessment report they had to carry out. They took some water samplings and went to look at wildlife and biomass in the village. These aspects will not be a part of our report.

To gather our common data for our common proposal, we used different methods; e.g. PRA, interviews with households and key informants, soil samplings, transect walks and own observations. We experienced a big difference in how much education we had received in the different methods. The Malaysian counterparts did not feel secure about PRA, but they were very open-minded and interested in learning.

Some of the difficulties with the Malaysian counterparts have been they often had an idea about how things were in the village instead of going and ask the villagers. We had two Bidayuh members in our group; this had both advantages and disadvantages. The advantages were that we had more than one interpreter, the disadvantages was these persons had an idea about the culture but did not consider there could be internal differences. The result was that sometimes there were questions which were answered by the Malaysian counterparts instead of the villagers.

Another difficulty we meet was the language. In the beginning the Malaysian counterparts did not consider our language problems. We raised the problem one evening and explained that even, what would be considered as a normal conversation could

contain important information for us, so they had to share this information. Most of the Malaysian counterparts did this afterwards.

We also had an incident in the village where a part of the Danish group made the villagers insecure. We found a solution to this problem in cooperation with the Malaysian counterparts and the professors. The incident taught us that we have to respect and think twice when we are working under other conditions than Danish. The villagers were very indulgent with this incident, which usually would have given some kind of fine or other punishment.

A very good experience was our interpreter Andrew who was good at translating and gives general information about the village and Malaysia.

## References

Andriesse, J. P. (1972): The soils of West-Sarawak (East- Malaysia). Government printing office, Sarawak, Kuching.

DFID (1999): Sustainable Livelihoods Guidance Sheets

Horowitz, Leah Sophie (1998) "Integrating Indigenous Resource Management with Wildlife Conservation: A Case Study of Batang Ai National Park, Sarawak, Malaysia" Human Ecology, Vol. 26, No. 3.

Implementation and coordination unit (ICU), 09-04-2006.  
Poverty line: <http://www.icu.gov.my/pdf/sabah.pdf>.

### Relevant Literature:

Black, T. R. (1999). Doing Quantitative Research in the Social Sciences. An Integrated Approach to Research Design, Measurement and Statistics. Sage Publications Inc. New Delhi, Thousand Oaks, California 91320.

Boserup, E. (1995): The condition of agricultural growth. The economics of agrarian change under population pressure. Earthscan Publications Ltd. London.

Cramb, R. A. (1992): Shifting Cultivation and Sustainable Agriculture in East Malaysia: A longitudinal Case Study. Agricultural Systems 42 (1993) 209-226.

Hansen, T. S. (2005): Spatio-Temporal Aspects of Land Use and Land Cover Changes in the Niah River Catchment, Sarawak, Malaysia. Singapore Journal of Tropical Geography, 26(2), 2005, 170-190.

Jackson, B., Nurse, M., and Singh, H. B. (1994): Participatory mapping for community forestry. Rural Development Forestry Network Paper.

Mikkelsen, B. (2005). Methods for Development Work and Research. A New Guide for Practitioners. Sage Publications Inc. New Delhi, Thousand Oaks, California 91320.

Paluso, N. L. (1992): The political ecology of extraction and extractive reserves in east Kalimantan, Indonesia. Development and Change, 23(4): 49-74.

Patton, M. Q. (2002): Qualitative Research and Evaluation Methods. Sage Publications Inc. New Delhi, Thousand Oaks, California 91320.

Rea, L. M. and Parker, R. A. (1997): Chapter 1, An overview of the sample survey process & Chapter 2, Designing effective questionnaires & Chapter 3, Developing survey questions & Chapter 9, Presenting and describing survey data. Designing and conducting survey research: a comprehensive guide. 2<sup>nd</sup> ed. Jossey-Bass Pub. San Francisco. Pp. 10 – 14, 27 – 62, 147 – 162.

Rigg,J. (1998): Rural-urban interactions, agriculture and wealth: a southeast Asian perspective. *Progress in Human Geography*, 22(4): 497-522

Turner, R.K., Pearce,D., Bateman,I. (1994): *Environmental Economics. An elementary introduction*. Chap. 3., 10., 11. Prentice Hall, Great Britain.

Vincent, J.R., Rozali.M.,A. (2005): *Maneging Natural Wealth. Environment and Development in Malaysia. Resources for the future*, Washington D.C.

## **Lists of appendix**

Appendix 1: Individual activity during field trip in kpg. Danu

Appendix 2: Household level survey instruments (household questionnaires in the form of semi-structured interviews)

Appendix 3: Results of PRA problem, opportunity and preference ranking and scoring

Appendix 4: Final synopsis

## Appendix 1: Individual activity during field trip in kpg. Danu

### Albarune's daily activities

Date	Daily activities
<b>06 March</b>	<ul style="list-style-type: none"> <li>Arrived at Kuching International Airport at 10.15 and Welcomed by Torben and Dr. Grabel</li> <li>Travel to kmpung Danu Welcomed by the villagers, Malaysian counterparts as well as Danish students as I arrived one day later in Kuching</li> <li>At the evening discussion with Malaysian counterparts about our research proposal and plan</li> </ul>
<b>07 March</b>	<ul style="list-style-type: none"> <li>Discussion of research proposal and plan with Malaysian counterparts</li> <li>Informal visit to village committee secretary and advisor's, houses, informal chatting with them about politics, economic, agriculture etc.</li> <li>Walk to the village</li> <li>Briefing</li> </ul>
<b>08 March</b>	<ul style="list-style-type: none"> <li>Discussion of research proposal and plan with Malaysian counterparts, Identified common proposal and get ready to field survey</li> <li>Presentation of our common project proposal to the Padawan Municipal Council</li> <li>After presentation, a short meeting with all Danish students and supervisors</li> <li>Informal visit to village committee headman and assistant secretary houses, informal chatting with them about politics, economic, agriculture etc</li> <li>Informal visit to some farmers' houses, chatting and passing some times. Observations, etc</li> <li>Briefing</li> </ul>
<b>09 March</b>	<ul style="list-style-type: none"> <li>Discussion about time schedule, Preparation of household questionnaires, semi-structured interviews questions guide line and key informant interviews questions guide</li> <li>Briefing</li> </ul>
<b>10 March</b>	<ul style="list-style-type: none"> <li>Briefing (time schedule for questionnaire and a schedule for our fieldwork)</li> <li>Pilot test - households questionnaires, Short briefing and review on questionnaires</li> <li>Finalize questionnaires and Started of household questionnaires survey for final data collection</li> </ul>
<b>11 March</b>	<ul style="list-style-type: none"> <li>Short briefings from previous day and work</li> <li>To prepare PRA ranking and scoring exercises strategy</li> <li>Appointment to carry out headman interview &amp; questionnaires</li> <li>To carry out PRA ranking and scoring exercises</li> <li>Continue to carry household questionnaire</li> <li>PRA data analysis and Update activities</li> <li>To prepare next day's activities</li> </ul>
<b>12 March</b>	<ul style="list-style-type: none"> <li>To prepare Interview strategy and questions guide lines</li> <li>Collected data analysis</li> <li>Briefing on data analysis</li> </ul>
<b>13 March</b>	<ul style="list-style-type: none"> <li>Key informant interviews, Interview review</li> <li>Data analysis and Briefing</li> </ul>
<b>14 March</b>	<ul style="list-style-type: none"> <li>Key informant – headman interview, Venn diagram exercise session with participants</li> <li>Analysis of households questionnaires data, short briefing</li> </ul>
<b>15 March</b>	<ul style="list-style-type: none"> <li>Visiting other groups to other kampung</li> <li>Data sorting, data categorizing, data compiling, data analyzing</li> </ul>
<b>16 March</b>	<ul style="list-style-type: none"> <li>Data sorting, data categorizing, data compiling, data analyzing continued</li> <li>Preparation of the preliminary finding for presentation</li> </ul>
<b>17 March</b>	<ul style="list-style-type: none"> <li></li> </ul>
<b>18 March</b>	<ul style="list-style-type: none"> <li>Presentation at Padawan Municipal Council</li> </ul>

	<ul style="list-style-type: none"> <li>• Compiling and data management, Photography compiling</li> <li>• Community service</li> <li>• Farewell dinner at Kpg Danu</li> </ul>
<b>19 March</b>	<ul style="list-style-type: none"> <li>• Back to Kuching and farewell dinner between Malaysian &amp; Denmark counterparts and supervisors, organizers</li> </ul>
<b>20 March</b>	<ul style="list-style-type: none"> <li>• Left for Denmark</li> </ul>

### Evert's Diary

Date		Activities
Wednesday	08/03/2006	Arrived Kampung Danu
Thursday	09/03/2006	Discussion of work plan
Friday	10/03/2006	Working on Questionnaire
Saturday	11/03/2006	Test question and make adjustments
Sunday	12/03/2006	Introductory meet with the villagers
Monday	13/03/2006	-Biodiversity and Wild life
Tuesday	14/03/2006	Soil Sampling Collect water sampling
Wednesday	15/03/2006	Key format interview
Thursday	16/03/2006	Party at the PM's residence
Friday	17/03/2006	Preparation of power point presentation
Saturday	18/03/2006	Presentation of data collected in the DO's office Farewell party at Kampung Danu
Sunday	19/03/2006	Move to Kuching Party with counterpart in Kuching
Monday	20/03/2006	Travel Back to Denmark
Tuesday	21/03/2006	Arrived Denmark

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### Diary By Signe Welleius Plange

3/3-06: Departure to Malaysia, Kuching.

4/3-06: Arrived in Kuching Malaysia. Saw Kuching, with the rest of the group. People arrived to Telang Usan during the day. In the evening we went to a really nice seafood restaurant.

5/3-06: Most of the Danish group went to a river. I went to Mating Wildlife center instead. At 14:00 the Malaysian counterparts arrived to the hotel and we had the first meeting. We received official cards with our names and emergency contacts. The Malaysian counterparts in our group had bought a bracelet for all of us, we received.

They weren't aware that Albarune had joined our group.

Christopher and I were the only representatives from the Danish group at this meeting, Albarune would arrive the next day and Evert on the 8<sup>th</sup> of March.

We had a good talk with the Malaysian counterparts about our synopsis. After the meeting, the Malaysian team leader Ringgit and Silla invited Christopher, Torben and I to their local coffeeshop. This was my first experience with Malaysian coffee; we would call it beer in Denmark.

The Malaysians were very friendly at the coffeeshop and we got an insight in Malaysian culture. I asked why Kuching was named cat and I was told it was because of a fruit called cateyes which grew a lot in the area. Unfortunately I did not get a chance to taste it.

6/3-06: HANGOVERS... was the day's first experience. But luckily Christopher and Ringgit had hangovers too. We were going to Kampung Danu at 10 a.m. We drove with our interpreter Andrew. On the way to Kampung Danu we all met from the Danu group at a small restaurant where we got some noodles and soft drinks. We were supposed to arrive in Kampung Danu at 11 a.m. but we arrived at 11.30. Christopher and I were a bit surprised when we saw the new road to Kampung Danu, we had imagined something bigger. Half of the road was still gravel road.

When we arrived to Kampung Danu it was extremely hot. We were met with music from the gongs and fireworks. There was water on bottles, tea and coffee with lots of sugar, rice in banana leaves, where I of course ate the banana leaf because I did not know any better. Then we were served chicken, rice, preserved durian, cucumbers and prawn paste which were very hot.

Albarune arrived during this small feast.

I talked with some of the villagers which spoke "broken" English as they called it, they offered me langkau, which I tasted and I was very surprised over the taste which was fine. Then one of the villagers asked me if I wanted to try and play on the gongs which I said yes to of course. I tried to play the rhythm and the leader on the gongs. Christopher came too and tried.

Afterwards we were shown to our accommodation. I was staying with the other girls in a local house in the village owned by Nigos. We called it the five stars hotel compared to the boys accommodation. I had a long and good chat with the Malaysian girls. In the evening we started to discuss our common proposal. We might have been a bit dominating in the Danish group during this evening. We came up with some ideas for a main research question and some hypothesis. We had a talk with some of the people from the village which came to a small meeting we held and told us about the village and their problems and we told them about who we were.

7/3 – 06: This morning we went to visit some of the villagers to hear about their problems and get some information about the village and the villagers life.

We had our first accident during this session where Lim got caught between the boat and the bottom of the river, which resulted that she was, injured the rest of the fieldtrip.

The rest of day went with discussing our proposal and preparing a power point presentation for the next day. We decided in the group that Niponi and I should do the



presentation together. Niponi did the background presentation and I did the methodology part.

8/3 – 06: I was nervous that morning, I went to bed around 2 o'clock in the night and went up at 5.30 in the morning to get ready and try to find some time to prepare the presentation. Even though I was nervous I still felt it was a good exercise for me and this was the reason why I agreed to do it.

After all the presentations Christopher and I went for lunch with Andrew and Lim. People went to do different things, so after the lunch we went to see Andrews house and meet his children in one of the villages nearby Kampung Danu.

We went back to Kampung Danu around 5 p.m. and had dinner. In the evening we discussed about the questionnaires and which questions we needed to get answered to be able to answer our research question, hypothesis and objectives.

Evert arrived at 20.30 p.m. this evening. I showed her our "hotel" and she joined us after she had put her luggage in the room.

9/3 – 06: We started with breakfast like every day and the local village cats were as always a participating in the breakfast with loud Miaus.

After breakfast we had a discussion about our time schedule and the questionnaires. We divided us into 5 groups where each group got an objective to find some questions for. We decided together in the group to carry out timeline and community mapping in the evening. We send Andrew to find some people who could participate in the timeline and community mapping.

After lunch we divided us into five groups. Liew and I made a strategy for the community mapping in cooperation with Penny and Christopher who made the timeline strategy. Ringgit and Naynggau asked some villagers about electricity to find out which questions could be relevant for the questionnaires. Evert and Niponi went to the market. Lim and Albarune typed in the questionnaires on the computer.

When Niponi and Evert came back from the market, Niponi said we needed to have a community meeting this evening. This gave a lot of discussions because we already had planned two exercises this evening. But Niponi insisted and even though we asked Andrew who said it was not necessary we decided to give in and take it as a learning experience. So the community mapping team and the timeline team decided only to perform the timeline this evening because we did not have time for anything else.

The timeline exercise began at 19:00 and the community meeting at 20:00. This meant we did not have enough time to do the timeline and the participants would have liked to continue the exercise.

After dinner Evert and Ringgit prepared the headman interview, while we performed the timeline.

At 8 pm the community meeting began. We told about our purpose in the village, personally I thought we promised too much and it sounded like we would and could bring changes to the village more than it was a study which actually would benefit us in our education.

We handed out some Danish butter cookies at the meeting and we handed over a statue of the little mermaid, and I tried to tell the fairytale as good as I remembered and Andrew translated.

10/3-06: We ate breakfast at 8.30. At 9.00 we had a short briefing about the exercises the day before and about the questionnaires. At 9.30 we had a pilot test of the questionnaires. I was in a group with Ringgit, Andrew and Nyanggau. I told Ringgit to lead the session because he had never tried it before. It went a bit slow in the beginning but then it got much better. The pilot tests of the questionnaires went well. Afterwards we had a short briefing and review of the questionnaires.

After lunch we were divided into three groups. Group 1 (Paul, Liew, Evert, Penny and Niponi) made a strategy for soil and water samplings. Group 2 (Ringgit, Christopher, Nyanggau and I) went on a walk with the GPS to get some points. Group 3 (Lim and Albarune) finalized the questionnaires.

When we came back from the walk with the GPS, Christopher deleted most of the GPS points by accident. This is what happens some times.

After dinner we were supposed to perform the community mapping at 19:00. Niponi had announced it at the community meeting the day before but we did not have any final appointments which meant nobody came. Very fast Andrew made some appointments with some of the villagers to meet us at the community hall. At 20:00 we started the community mapping session; it gave some difficulties because the villagers had already drawn a map over the village and the households. Instead we asked them to draw some of the surrounding areas; the fields, churches, mountain ranges and so on. The group which performed the community mapping was Penny, Liew, Christopher, Andrew and I.

The rest of the group divided into two and went to perform the household questionnaires.

11/3-06: The day started with breakfast at 8.30. At 9:00 we had a short briefing about yesterday's activities and exercises. At 10:00 we divided into three groups where Penny, Niponi and Nyanggau went to take water samples for the Malaysian counterparts EIA-report. Lim and Albarune prepared the strategy for problem ranking. I was in a group with Liew, Paul and Christopher; we went to verify the community map we made yesterday. We followed the pipeline to the water intake point; it was a hard and hot trip. We had to wear long clothes because of idles. It was a nice trip even though it cost a lot of sweat. I never figured out why Christopher and I sweated so much and even Liew sweat a lot, but Paul did not even have a drop of sweat on his forehead. I found out during the trip I liked to perform different kind of walks to the fields during the day, because it was so hot that I get lazy and tired when I was just sitting in our basecamp.

After our first walk where we followed the water pipeline, we went to the river to get cooled down. We had lunch before we went to the other side of the river to try to verify some of the data about which fields should be cultivated on this side of the river. At this point my energy level had dropped several meters but I managed to find it again after half an hour or so.

In the evening after lunch I carried out questionnaires with Liew and Andrew. Andrew was very good as an interpreter in these sessions, so I felt I get something from performing the questionnaires.

In the evening we made the plan for the next days exercises as always.

12/3-06: I slept late this morning while some of members of the group went to church. Because it was Sunday people were home from the fields, so we had the possibility to

interview them during the day. This was the last day we had for the questionnaires. Later in the afternoon I prepared the interview guide for the department of agriculture while Christopher prepared the cropping calendar exercise which was supposed to be performed in the evening. Suddenly we got visitors from Plaman Nyabet.

This was the day where there were a conflict between Evert and Christopher, which I won't go into because I do not want to offend anyone. The only thing I can say is I think they both had some guilt for this incident, but they managed to talk things through the next day and solve their problems as far as I know, and we have been able to work as a group since.

The cropping calendar exercise were moved because of this incident, the worst part of it all was the villagers felt insecure about the situation. I wanted the cropping calendar exercise to be done instead of canceling it because it could have had a calming effect on people and even though I did not know the exact strategy my opinion was we could have performed it twice. But everyone was confused so somebody cancelled and some tried to gather the people for the exercise. At last we agreed with the villagers to make the exercise the next day. Afterwards I went to say sorry on the behalf of the Danish students and explain nothing was wrong, it was just a Danish way to express opinions. I talked with Robert about this.

After this we decided to take the evening off and one of the villagers had invited us to his house to a party. It was nice to relax and calm down after all these problems which I had to try to handle. I spoke a bit with the Malaysian professor Stanley and we agreed it was a good idea if Evert and Christopher had a chance to talk with one of the Danish professors and each other the next day, because they had not spoken after the conflict started. Andreas was luckily going to be in Danu the next day. I had a good evening afterwards.

13/3-06: On this day Lim and Albarune finalized the semi-structured household interviews. In the evening I performed two interviews with Evert and Andrew. During the day Ringgit and I went to the department of agriculture to make an appointment, but we were able to make the interview immediately which was nice. When we finished professor Stanley asked if we wanted to eat lunch, but we had an appointment in Danu with a guide who should take us on a transect walk and we were already late, so I insisted that we went back to Danu. When we arrived Christopher had already gone with the guide, Andrew and Andreas.

14/3-06: This day I was on a transect walk with Ringgit and Kelvin during the daytime. We also found a beautiful bidauyh bridge. Our guide found bamboo-shoots for our dinner. In the afternoon before dinner I showed Christopher the bridge. In the evening I performed semi-structured household interviews.

I made a suggestion about going with one of the villagers the next morning to tap rubber. An appointment was made.

15/3-06

Up at 5 o'clock... We had to meet the villager at 5.30 to go and tap rubber. Christopher, Kelvin and I were the only ones who went. It was quite interesting. We came back to the camp at 10.30 and we found the camp empty. There was a note that people went to Sadir and would be back at 17.00 and we could do whatever. I admit I got a bit angry in the

beginning because we had a plan for the day's activities and we had decided to take the next day off. But I decided not to feel responsible for everything would be made and chose this was the day of and some activities like follow-up interviews would not be able to be performed if necessary. It was a nice day, we went with Andrew to Sadir first to say hello. After this we went to Subang because we had heard they had a hard time. We took Maj Brit and Johanna with us to the Semenggoh Orangutang Center. After this I went to the pharmacy to try to get something against all the sandflies which were eating my legs. We ate an ice cream and went to Plaman Nyabet to say hello. After the visit in Plaman Nyabet we returned with Maj Brit and Johanna and went back to the Danu.

16/3-06

This day was used to finalize the last data, so we went to Bengoh to find a place we could borrow with our computers because there was no electricity in Kampung Danu. When we came back we got visitors from Subang, so we went to the river.

In the evening there was a party for all the sluse students. It was a nice party and nice to see everyone again.

17/3-06

This morning I went to a field with Christopher to measure the area size of the field. In the afternoon we decided which gifts we wanted to buy for the village. I went to the city with Ringgit, Andrew and Christopher; we ordered the gifts which should be picked up the next day. On our way back Christopher mentioned Ringgits local coffeeshop, which meant we ended up here. Ringgits boss were there and he bought food and beer for us, we got the most expensive fish in Malaysia we were told. It was a fish from the river and it had to be eaten the same day it was caught. It tasted really good and had really big thethes.

We went back home after the coffee shop where Christopher, Evert, Liew and I stayed up till 2 a.m. to prepare the presentation. We could not print which gave problems the next day and nobody was prepared because they did not stay up till the presentation was finished.

18/3-06

Look a bit on the 17<sup>th</sup>. We went to the presentation and I decided I would not do the presentation this time; I took the hard job the last time so I thought everyone should try. This time almost everyone from the group said a bit.

After the presentation I went to pick up the photo with Liew and Christopher. We also went to a fruit market, which were really interesting and I tried fruits I never knew existed.

In the evening we had a party in the village. I held a speech and we played the gongs, danced bidayuh and a lot more. I get a lot of new friends this evening, all the teenagegirls from the village which loved to touch my hair. They were a bit shy in the beginning but a digital camera can do a lot I learned this evening.

19/3-06

Goodbye day. I ate breakfast in the house where I lived. After breakfast I went to say goodbye to all the villagers and was invited for coffee and fried bananas. I got a lot of gifts this morning and promised to send a lot of photos to Danu.

We went back to Kuching where Christopher and I spent time at the national museum and afterwards we were drinking ice coffee at the waterfront.

In the evening we went to a party with the Malaysian students. We sang karaoke and had a good time, when the place closed we tried to find another place. Suddenly Christopher decided to make a disappearance act so he jumped out of the car. Then I ran after him, but he did not want to go back, he would take a taxi so I decided to go back when Andreas showed up and I went back... well we have laughed of this episode a couple of times afterwards. Nobody really knows what and why it happened... Too many beers are my guess.

20/3-06

This day I said goodbye to my part of the Danish group and went to Bako national park. Finally a bit of holiday ☺

### **Diary by Christopher**

Arrival at Kuching Airport on the 3/3 at 19 pm, took a taxi to hotel Telang Usan. Since no one else had arrived I decided to walk outside the hotel, to see what the neighborhood was like. I soon found myself in the vibrant surroundings of restaurants, Coffey shops and weird shops. Since the local people looked at me, as if I had arrived from an other planet, I decided to return to the hotel to see if Torben, Andreas and Ahmad had arrived. They had – I was safe. We went to the same area I had just left, to eat some of the local food, which Andreas most confidently ordered as if he came there every day. After the dinner, we went to Holliday Inn at the river to drink some beer and play pool – afterwards we returned to the hotel listened to music and had some of Torbens whiskey.

The next day (4/3) all but Albarune, Evert and Jude arrived. Torben, Andreas, Ahmad and I had breakfast, but decided to split up afterward, since Andreas was very sleepy and Torben had some planning to do before the students arrived. Ahmad and I went out into Kuching to explore the vast city. We went to the Chinese part of the city, the waterfront, shopping malls, local stadium, market place etc. Arrived back at the hotel around 14pm as we had agreed with Torben. The others had arrived and we went to the waterfront again and had Laksa, afterwards we went to the local fish and fruit market and the Indonesian marked street. In the evening we had diner at a restaurant located on the rooftop of a car park. We were joined by two of my fellow geographers Thomas and Nicolai. They proposed that we should go on a river “trip” the following day. After the diner we went to one of the local bars to hang out.

On Sunday (5/3) most of us went on the proposed river trip - it was great fun and an experience I would not be without. Unfortunately the low water level resulted in slow current and therefore, that we arrived 40 minutes later than we had planed at hotel Telang Usan. This meant that the Malaysian counterparts had had to wait and the presentation of

the groups was delayed - they must have gotten a bad first impression of us. Signe and I were the only from our group to meet with our counterpart, since Albarune and Evert had not yet arrived. It was nice to finally meet the people we should work with the next weeks and my first impression of them was very good. They had before our arrival selected a group leader, something I have never worked with before in my academic career. After the presentation of the different groups, the group leader Mr. Ringgit and Mr. Silla invited Signe, Torben and I to their local Coffey shop for a cop of "coffey". We had several that evening. We meet some of the friends and colleagues and had diner at the Coffey shop. Even though we had been drinking heavily Mr. Ringgit decided he should/could drive us back to the hotel. In Denmark I would never agree to such a thing, but since I did not know of the local customs, I decided it was best to trust his judgment – I soon regretted that decision, since he all the way back to the hotel aimed for the lines on the tar seal to keep the car on the right lanes. We arrived "safely" at the hotel though after a fantastic evening.

Monday (6/3) was dominated by me having hangovers. We meet with the Malaysian counterparts at the in front of the hotel and left in on of the rented cars with Andrew for Padawan, where Signe and I had a local dish of noodles. We then left for the village.

At the village we were met by fireworks and music on the local instrument – gong(s). We meet a lot of the villagers, talked with those who understood English and also those who did not. The women had prepared different dishes e.g. rice wrapped in banana leaves, which I ate – leaves and all, because I did not know any better. At the meeting I was for the first and not last time introduced to the local brew langkau and tuak. After the lunch Signe and I tried to play on the different gongs – it was very difficult to hold the right rhythm. I then went to the house where I was going to work, eat and sleep during our visit in the village. In the afternoon I went with Liew and Paul to visit the headman. In the evening we were visited by the village representatives and other interested people. We introduced our self and they told us of the challenges in their village. Again we had some of the local stuff. We then spend the rest of the night discussing the common project, trying to combine the themes introduced in the Malaysian synopsis with ours.

Tuesday the 7/3 we started by making a plan for the day. We split up into a few groups and then went out into the village to meet people in informal talks. My group was soon invited into one house after the other. Their hospitality kind of blew me away. After a couple of hours we returned to the base camp – my "eat, sleep work house" - and found Lim injured from her visit to the river. Niponi, who was in my group, took her to the hospital. Afterwards I went with Mr. Ringgit to do some more informal interviews. We met Stanley Rekop and his wife who were transporting the rubber to their processing facilities. The rest of the afternoon and evening we spend discussing and preparing the presentation for the next morning. We went to bed around 2 in the night. Signe was pointed out to make the presentation since no one else wanted to and since she had been one of the most active in the discussions that day. People felt that she would be the right person to perform the presentation.

Wednesday we got up early around 5:30, so I was very tired. We left for Padawan and had breakfast at the same restaurant we had visited on the 6<sup>th</sup>. We were the first to make

the presentation, which were an advantage for us and disadvantage for the other groups since we used a lot of time. After our presentation we were confronted with some questions from the panel of professors and politicians. YB James pointed out that we should not neglect to focus on education issues – I “kindly” told him he had not listened to what Signe had presented and that we had no interest or plan of investigation the influence of education on the livelihood strategies in Kampung Danu. I must admit, that I could have handled the situation more diplomatic, but having said that I do not regret my actions/opinions. After the group presentations Signe, Lim, Andrew and I had lunch, then we went to see his family. After the very demanding discussions the other days, it was nice to see other people and other social settings. In the afternoon and evening we reviewed the feedback from the presentation and started to work on the questionnaire framework.

Thursday the 9/3 we started with the daily briefing. As usually signe, albarune and I, were the most dominating. Afterwards we divided in to 5 groups. Since we were preparing two PRA sessions for the night, we thought it best to make to of the groups into one. So Penny, Signe, Liew and I worked together on the community participatory mapping and the timeline. Penny and I had responsibility for the timeline. The rest of the groups prepared key informant interviews and performed informal interviews on the electricity issue. During the afternoon Niponi announced that he had planed a community meeting in the same time as we were doing the PRA exercises. This was not taken kindly by either Signe or me, since we would only have 1 hour to finish the CPM and Timeline. At the meeting we presented what we were going to do while staying in town, why we where there and what we expected of our stay. I was clear that some of the group members had an idea that we were going to find all the solutions to the challenges the village is faced with. No one including myself dared to mention that the reason for stating in Danu was to test and tryout different methods of data collection, analysis etc. We had in Denmark prepared for the community meeting, and had therefore brought Danish butter cookies and a statue of the little mermaid. Signe told the story – I did not recognize all of it, but it seemed the villagers enjoyed it.

Friday the 10/3 started with the by now mandatory briefing. After breakfast we performed pilot testing of the questionnaires. We returned to base camp for lunch and were afterwards divided into 3 groups. I explored the village residential and agricultural area together with Nyanggau, Ringgit and Signe. We brought the GPS to start map the area for later analysis. The two other groups worked on the soil and water sampling (Evert, Liew, Penny and Paul, Niponi) and Albarune and Lim finalized the questionnaires at base camp. When we returned I unfortunately deleted most of the waypoints we had gathered during our walk<sup>8</sup>. In the evening we were suppose to do the CPM, but nobody showed up at the agreed 19:00. Fortunately Andrew managed to find some people who were willing to participate. This was not an easy task, as it was announced on the community meeting that people should stay at home from 20:00 because we had to start

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<sup>8</sup> - Or at least so I thought. When Torben came with the GIS program al the points were still there, just not the way I thought I had saved it.

on the household survey, and we needed people to be available. At that meeting the headman emphasized, that all would do there best to be available.

Saturday the 11/3 we started with breakfast, followed by my favorite meeting – the briefing. We decided that someone (Paul, Liew, Signe and I) should try and verify part of the information gathered from the timeline and the CPM. So we decided to try and find the water intake point in the multipurpose forest areas on the southwest side of the village. We did not manage to find it, but it was very fun and interesting to walk in “dense” forest on small footpaths. Even though I am afraid of spiders and other nasty bugs, we saw a lot of very interesting specimens, that I of course had to take pictures of up close. I had never in my wildest imagination thought that it could be so hot in the forest, but I think I lost at least 5 gallons of body fluids blood from bug bites and then sweat. After the walk we cooled down in the river, had lunch and decided we had not had enough, so we went to the other side of the river to “investigate” some of the cocoa farms over there. In the evening I did questionnaires together with Paul, which was no success, since he did not always remember to translate.

Sunday the 12/3 started out fine although. I must admit that I was beginning to get a bit annoyed of the working culture in the group. I felt like it was always the same persons including myself that had to put something on the agenda, to make sure that we actually managed to get just some of the information we needed to answer our hypothesis etc. The culmination was near. I started the morning attending Sunday service at the Anglican Church. Even though I am a protestant of sorts I really enjoyed the service. It was also nice to meet with the villager in a different way. I was my first time in a church where men are separated from women and children. I tried to sing along with the psalms but it was in the local dialect. After the service I started working on the cropping calendar. When we then got visitors from Plaman Nyabet I got really frustrated, because I felt I had not had one hour of spare time relaxing. So I unconsciously told our visitors to go somewhere else in a very impolite manner – I tried to apologize because I knew I was out of line, but the harm was already done. All my conflict management really helped me there – not. Later the afternoon, Evert approached me, well more precisely attacked me. She asked me why I did not want to see her happy, why I was so mean to her and everyone else. I told her that I was sorry that she felt I treated her badly and could not really see how I could have treated her the way she said, when she had not talked to me on the trip so far. She asked me if I had something against her – she wanted the truth – so that was what she got. I told her that I did not feel she had in any way contributed to the project either in Denmark or here in Malaysia. I told her she was not on holiday. Then she really got excited calling me a racist, screaming and yelling like crazy and finally threatened me - can’t remember with what, but I remember how I felt. I felt violated!

Later that afternoon some of the group members I was suppose to carry out the cropping calendar with, said they really did not want to anyway, so if I could do I alone then...that was it – could not handle anymore. I decided that it would be best if I did not perform the exercise, as I was not in a state were it would be beneficially for the group – I needed some air, so I left the village.....



Monday the 13/3 was different. I knew that there would be some kind of response on yesterday's episode. Luckily Andreas arrived in the village and I had an opportunity to talk to someone who listened to me – and tried to understand – it helped. I tried to perform a transect, which most of all resembled a eco-tourist walk in the landscape. I know I did something else this day but, everything is blurred because of the situation.

Tuesday the 14/3 I did soil sampling with Paul, Niponi, Evert and Nyanggau. In the evening I performed the cropping calendar with Niponi, Lim and Penny. Before we had dinner that evening Signe took me to see one of the local traditional bamboo bridges. In the evening Signe made an appointment for going rubber tapping the following morning, I thought it would be a memorable experience, so I signed up as well.

Wednesday the 15/3 we went out very early to start the rubber tapping with one of the local. Kelvin joined us that morning. We stayed out in the forest until around 9:00 and decided we should get back to start the program of the day. When we arrived the camp was empty. There was a note that everybody had left for Sadir. They must have really thought it through. Neither Signe nor I have a driver's license so we could not go anywhere. Luckily Andrew was still in Danu and he offered to take us where ever we would like. So we visited Sadir, Subang (where we picked up May Brit and Johanna) went to a orangutan center, visited Plaman Nyabet, returned to Subang and finally arrived back in Danu at 17:00

The 16/3 was used to finalize the preliminary data collection and file distribution. So Niponi, Liew, Nyanggau and I went to Bengoh to use some of their electricity. Shortly after returning to the village, we received visitors from Subang. Ahmad, May brit and Johanna had decided to come and visit us. In the evening we went to YB James party. It was fun and especially nice to see everybody again

On the 17/3 Signe need some help measuring the land size of the area where she performed the transect with Ringgit and Kelvin. Afterwards we went to the town with Andrew and Ringgit to get the gift for the village. On our way back from town I mentioned the coffey shop Ringgit had brought us to the first day. A lot of his colleagues were there, and they ordered special dinner and lots of beer. When we returned to the village we spend the rest of the night until 2:00 preparing the presentation together with Liew, and Evert.

On the 18/3 we made the presentation in Padawan. When we arrived at the conference center we had not yet decided who should say what etc. so in the break I was informed that I had to make part of the presentation. I hate making presentation when im not well prepared, but I controlled myself – there was no need for another of my drama queen stunts. The presentation went ok under the circumstances. Afterwards Liew, Signe and I went to the local market in Kuching where we tried a lot of different fruit and other traditional Malaysian food I have never seen before and probably do not want to know what was. In the evening there was a party in the village. We danced the bidayu bird dance, drank langkau, had traditional diner and I had 2 wedding proposals from 2 very nice, but a bit too young girls.

19/3. This was the last day in the village. I had breakfast at Nigos's house, and managed to take a last walk in the village saying goodbye to all the people I had talked to during my stay. Back in Kuching Signe and I went to the national museum and went sightseeing at the waterfront. In the evening there was a party with diner and karaoke. We danced and sang almost all of us. Once again I managed to make notice of my self, by stepping out of a car to take a taxi home to the hotel - I admire the calm nature of my supervisors

20/3 I said good buy to Signe and the other Danish students going to Bako national park. I did not want to leave, but was at the same time looking forward to a few days alone.

## Appendix 2: Households level survey instruments (households questionnaires in the form of semi-structured interviews)

### Purpose

The purpose of the qualitative semi-structured interview is to investigate and obtain an insight from the households about the issues that are identified in our main research question and hypotheses. The interview was started by an introduction of us and our study and motivation for doing the interview.

### Identification

Village: Kpg Danu

HH number: \_\_\_\_\_

Date: \_\_\_\_\_

Respondent: \_\_\_\_\_

M/F

Age: \_\_\_\_\_

Sex: \_\_\_\_\_

Name of interpreter: \_\_\_\_\_

### Observation

#### 1.0 Demographic questions to households

##### 1.1 Are you the head of the household?

Yes

☐

No

☐

Please complete this table for all family members (including children) currently residing in your household.

No.	Relationship to head of household	SEX M=1 F=2	Age	Education Level	Occupation	Full (1) or Part-time (2) on farm? No work on farm = (0)
1.	Household head					
2.	Spouse					
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						

11.						
-----	--	--	--	--	--	--

Code for education level: 0 = no formal education, 1 = primary education, 2 = secondary education, 3 = high education (diploma, university)

1.2 Do any of the household members live outside the village (e.g. Kuching or other parts of the country)?

Yes	<input type="text"/>
No	<input type="text"/>

1.3 If “YES”, please complete the following table for any members of your immediate family that once resided in your home, but currently no longer resides in your household.

No.	Relationship to head of household	SEX M=1 F=2	Age	Education Level	Occupation	Full (1) or Part-time (2) on farm? No work on farm = (0)
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						

Code for education level

0 = no formal education

1 = primary education

2 = secondary education

3 = high education (diploma, university)

## 2.0 Sources of income (from cash crops)

	Income	Volume (Local unit)
2.1	Agricultural productions	
	2.1.1 Pepper	
	2.1.2 Rubber	

	2.1.3	Cocoa	
	2.1.4	Banana	
	2.1.5	Others (Please specify)	
2.2	Activities		
	2.2.1	Sundry shop	
	2.2.2	Middleman	
	2.2.3	Fruits sellers	
	2.2.4	Small contractors	
	2.2.5	Others (please specify)	
2.3	Remittances		
2.4	Pension		
2.5	Social welfare		

### 3.0 Land tenure and land use issue

3.1 Do you own any land?

Yes	<input type="text"/>
No	<input type="text"/>

If yes, what is the status of your land?

Status of land	Yes	No	Size of land (acre)
NCR			
Title			

If yes, please specify your size of land holding:

Size of land holding	Acre
Shifting cultivation	
Pepper	
Rubber	
Cocoa	
Banana	
Forest	
Fallow land	
Others	
Total	

### 4.0 the Agricultural intensification and extensification before and after new road

4.1 Have you increased production of cash crops within the last 3 years?

Yes	<input type="text"/>
No	<input type="text"/>

--

If yes, please give the following details:

Indicator variables \ Crop	Pepper		Rubber		Cocoa		Banana		Others	
	Bef	Aft	Bef	Aft	Bef	Aft	Bef	Aft	Bef	Aft
Land size										

4.2 Which one or more of the following factors have influenced the intensification?

Factors	Yes	No
Fertilizer application		
Pesticides		
Better market access		
Increased labour input/ land (field)		
Others (please specify)		

4.3 Have you extensified the cultivation of cash crops (include more land) in the last 4 years?

Yes	<input style="width: 150px; height: 20px;" type="text"/>
No	<input style="width: 150px; height: 20px;" type="text"/>

4.4 Are you participating in the banana scheme?

Yes	<input style="width: 150px; height: 20px;" type="text"/>
No	<input style="width: 150px; height: 20px;" type="text"/>

4.5 Which of the following factors have influenced your present crop selection?

Factors	Yes	No
Road		
Banana scheme		
Market prices		
Others (please specify)		

## 5.0 Workforce capability

5.1 How many members of the household works in the cash crop

No.	Female	Age	Male	Age	Total

5.2 Have you received any training regarding agricultural practices?

Yes	<input type="text"/>
No	<input type="text"/>

If yes, from which institution \_\_\_\_\_

5.3 Do you and any of your family members apply the training received from the relevant institution?

Yes	<input type="text"/>
No	<input type="text"/>

5.4 Do you have any health problems that affect your capability to do agricultural activities?

Yes	<input type="text"/>
No	<input type="text"/>

## 6.0 Electricity

If SESCO provides electricity supply in the village, would you like to:

6.1 Use electricity one or more of the following purposes?

Purposes	Yes	No
Household usage		
Agriculture purposes		
• processing		
• packaging		
• storage/preservation		
• Others		

*We would like to take this opportunity to thank you very much for your time and cooperation*

### Appendix 3: Results of PRA problem, opportunity and preference ranking and scoring

#### Problem scoring and ranking

Problem	Respondents						Total Score	Ranking
	Robert	Mike	Ahip	Stanley	Nigos	Jimmy		
Knowledge about agricultural production	5	2	5	4	2	1	19	<b>6</b>
Unstable crops price	4	4	5	2	4	3	22	<b>4</b>
Fertilizer	4	5	4	5	5	5	28	<b>1</b>
Limited access to market	5	5	5	5	3	4	27	<b>2</b>
Labor shortage	2	3	4	5	5	5	24	<b>3</b>
Seedling	3	5	3	2	4	4	21	<b>5</b>

5 = most important, 1 = least important

#### Opportunity scoring and ranking

Opportunity	Respondents						Total Score	Ranking
	Robert	Mike	Ahip	Stanley	Nigos	Jimmy		
Business opportunity	4	5	5	1	2	2	19	<b>6</b>
Easy access to medical facilities	5	2	3	5	4	4	23	<b>5</b>
Direct access to market for agriculture production without middleman	5	5	5	1	4	5	25	<b>4</b>
Easy to visit family members living in town	5	3	5	5	5	5	28	<b>2</b>
Better income opportunity	5	5	5	5	5	4	29	<b>1</b>
Increase of living standard	5	3	5	4	5	4	26	<b>3</b>

5= most important, 1 = least important

#### Preference scoring and ranking

Preference	Respondents						Total Score	Ranking
	Robert	Mike	Siru (F)	Stanley	Nigos	Agek (F)		



Long bean	1	1	1	3	1	1	8	<b>6</b>
Rice	5	5	5	5	5	5	30	<b>1</b>
Banana	3	3	5	5	5	5	26	<b>2</b>
Cocoa	1	2	4	3	1	1	12	<b>5</b>
Pepper	3	5	5	5	5	2	25	<b>3</b>
Rubber	4	4	5	3	3	5	24	<b>4</b>

5= most important, 1 = least important

## Appendix 4: Final synopsis

# LIVELIHOOD STRATEGIES IN KAMPUNG DANU



A final version of Synopsis  
01 March 2006



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## 1.1 Problem description to study area

Kampung Danu is located 40 km south from Kuching (Map 1). The village is accessed by the new Bengoh road. The village is located next to the Kiri River and consists of 56 houses where just 49 are inhabited due to out-migration. The houses are scattered along the river like traditional Bidayuh villages.

The villagers have only recently settled in this area (80 years ago). They came from the Kampung Bengoh, but were forced to move, because of land scarcity and increased population.

The community's land is held by the villagers through the Sarawak "Native Customary Rights" (NCR), which gives the rights to the land but not the ownership.

The infrastructure has been improved in the area where Kampung Danu is located, now the village is accessible by road, before the villagers had to walk to Bau to make their trading. The road has given better access to markets which means the products the villagers produce from agricultural and other activities can be sold directly to Kuching and Kampung Bengoh. The improvement of the infrastructure and better access to markets, have given the villagers a feeling of better livelihood (based on available background information provided by the Malaysian counterparts).

Another possible effect of the road is de-agrarianisation. De-agrarianisation is diversification out of agriculture, this means people leave agricultural activities and do other off-farm activities instead.

The primary agricultural activities in Kampung Danu are hill rice which is for subsistence use. Cocoa, pepper and rubber are grown as cash crops. Tapping of rubber has increased because of a rise in demand and prices on the market. The main income generating sources are rubber, pepper. The increase in tapping of rubber and better access to market we assume could be an increased source for economic income in the village.

Based on available background information provided by the Malaysian counterparts the agricultural development is limited. This can affect the development of sustainable livelihoods in Kampung Danu. Kampung Danu is sited in a hilly area which makes topography a possible factor for the limited development.

The aim of this report is to analyze the changes in livelihood strategies (see chapter 2.1) after the road was built. To reach this aim we have to examine the livelihood strategies before and after the road was built. To reach a better understanding of the livelihood strategies in Kampung Danu and why the villagers feel their livelihood has improved we will investigate the capacities of different capitals in the households.

The livelihood strategies will be analyzed in two levels of abstraction: community level and household level. The reason to do this is the different households might have different livelihood strategies and the feeling of better livelihood could count only for a number of households which are affected positively by the new road. Some households might still use subsistence farming and therefore have no relations to the new road. On community level we have to consider what has improved the common livelihood in the village.



Map 1: Map of Kpg Danu showing our study area (source: Google Earth)

## 1.2 Research questions

The main objective of this research work is to analyze the livelihood strategies in Kampung Danu. Based on the available information of the study area described 1.1, we have identified the following main research question that will organize the project, and give it direction and coherence. In order to answer the research question, the following hypotheses have also been considered.

### Research question

*How have the new road changed the livelihood strategies in Kampung Danu?*

### Hypotheses

The new road has changed the management of agriculture practice.

The new road leads to increased de-agrarianisation.

The new road has lead to a social and economic differentiation within the village.



## 2. Methodology

### 2.1 Research process and designing a research plan

A good research plan is always an important part of any research work to be undertaken successfully. We considered many issues, methods and approaches in a research plan before research will be carried out in the fields. Finally, our team identified research questions, selected and developed the methods and approaches for the fieldwork (Box 1). The following Figure 1 represents the main elements considered in our research process.

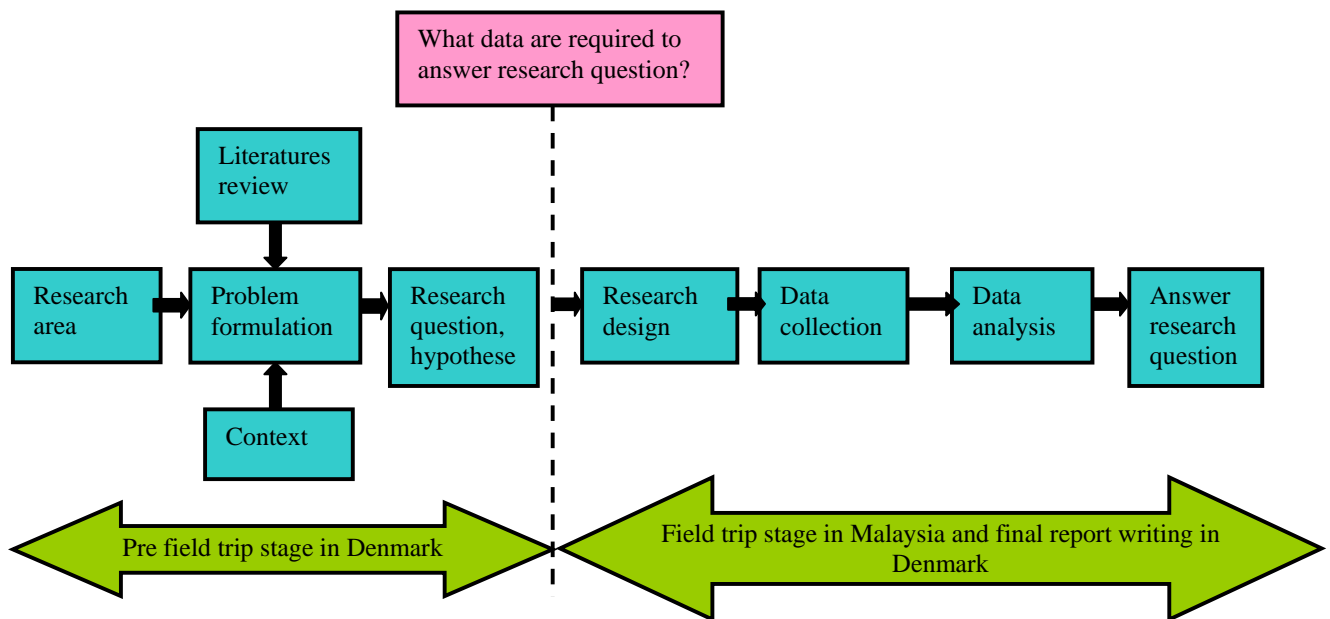


Figure 1: Simplified model of our research process

**Box 1: Design issues and methodological considerations of our research plan**

Issues	Considerations
What is the primary purpose of the study?	Action research
What is the focus of study?	Livelihood strategies in Kampung Danu village, Sarawak, Malaysia
What are the units of analysis?	Household
What will be the sampling strategy or strategies	Stratified sampling
What types of data will be collected?	Social science methods (Both qualitative and quantitative, PRA), natural science method (soil sampling), GPS tool for area measurements
What analytical approach or approaches will be used?	Inductive approach, descriptive statistical analysis
How will validity and confidence in the findings be addressed?	Triangulation method
Time issues: when will the study occur?	Short-term field study (Appendix H)
What resources will be available?	Project team members, data collection, materials, data analysis time, computers and printers, report writing and submitting, etc

*Source: After Patton, 2002: 254 (in Qualitative Research and Evaluation methods)*

**2.2 Livelihood strategies**

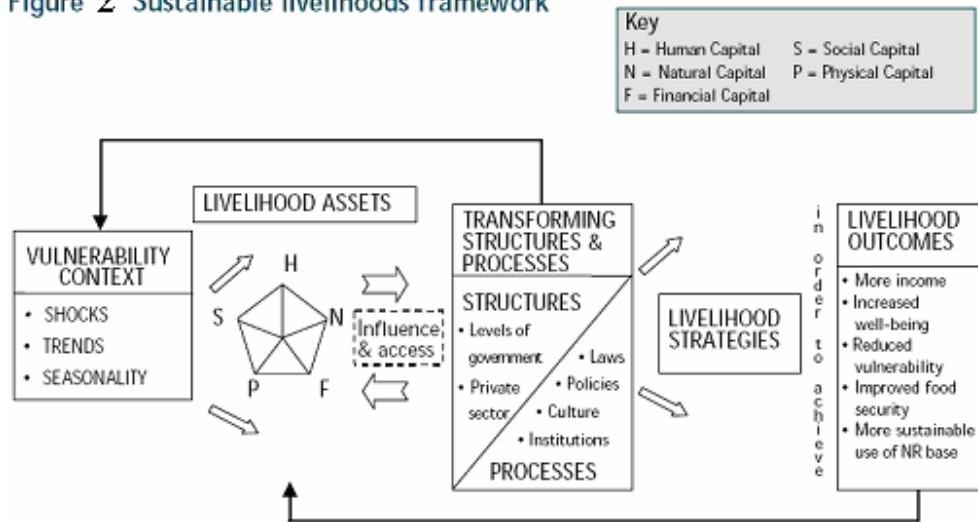
The analysis of the livelihoods in Kampung Danu will be performed on two levels; a community level and a household level. This is necessary if we wish answer the third hypothesis, which deals with social and economic differentiations within the village and weather it has changed or not.

The sustainable livelihoods framework which is shown below in Figure 2 helps to reach a better understanding of the livelihood strategies in Kampung Danu. The reason to use a framework like this is that it provides a checklist of important issues and shows how these are linked, furthermore it draws attention to core influences and processes and it shows the interactions between the various factors which affect livelihoods (DFID, 1999: part 2.1).

The figure contains different factors, which can help us to analyze what has been important for the improvement of the livelihood in Kampung Danu.

The arrows in the figure present different kind of relations and influences between the different factors but none of them imply direct causality. The figure consists of different factors which are all interrelated.

**Figure 2 Sustainable livelihoods framework**



*Source: DFID, 1999: part 1.1*

The livelihood outcomes are achievements from the livelihood strategies. The outcomes are again linked to the capitals in the sustainable livelihood framework. These are the human, natural, physical, social and financial capitals (appendix A). There can be different kinds of outcomes, which are valued differently according to the situation.

The livelihood outcomes are increased well-being, higher income, more sustainable use of the natural resource management, improved food security and reduced vulnerability (DFID, 1999: part 2.6).

The sustainable livelihood strategies will be used as a method to understand and analyze the livelihood in Kampung Danu. This will be done from the different factors described above. It will not be possible to go into all factors in depth. We will focus on factors which are relevant in context to our problem statement and an answering of this.



### **2.3 Proposed methods, data and data collection techniques**

The tools for gathering information useful to this study will be both social and natural science method. In addition to this, the information presented in this synopsis was generated by a desk-based literature review. Details description of proposed methods, data and data collection techniques are provided below:

#### **Social science methods**

##### **Participatory Rural Appraisal (PRA)**

- Community history (time line)
- Participatory mapping
- Farm sketch
- Community and farm transects
- Problem and opportunity ranking
- Seasonal activities calendar
- Venn diagrams

##### **Questionnaire and interviews**

- Household level survey instrument (questionnaire in the form of semi-structured interview)
- Semi-structured interviews (with village headman, household headmen in the fields and with elderly person)
- Community meeting
- Direct observation

##### **Natural science methods**

- Soil sampling

##### **GPS tool**

Area measurement

Before providing a detailed description of the proposed techniques for data collection, it is important to know the answers of the questions like: what type of information or data is relevant to answer the research question, what are the sources of information, and what are the suitable data collection techniques. Appendix B represents an over view of type of information and data required, sources of information and data collection methods to analyze and answer research questions.

## 2.4 Description of various data collection techniques

This section provides a detailed description of data collection techniques that will be used during the data collection phase in the study area.

### 2.4.1 Participatory Rural Appraisal (PRA) methods

PRA is a form of qualitative research used to gain in-depth understanding of the community problems, perceptions, resources, opportunities and potentials. This is a set of participatory research techniques, which ensure the involvement of the people to analyze their own situations and make decisions to tackle their own problems. PRA employ a number of tools to get a range of information on different aspects of rural life. It is both a philosophy and series of methods for carrying out participatory and qualitative research and gives more power to the community in perceiving, analyzing, planning and making their own decisions. Keeping in view the objectives of the research, PRA methods used in this study will be the followings:

PRA methods	Short description of the method	Information we can expect to gather from PRA methods
Community history (time line)	It describes important events of the community's past history	<ul style="list-style-type: none"> <li>• Community's establishment history</li> <li>• History about infrastructures</li> <li>• Other institutional establishment history (e.g., school, hospital, church, etc.)</li> <li>• Natural catastrophes (e.g., drought, flood, earthquakes, etc.)</li> </ul>
Participatory mapping	It provides an overview of the community and important infrastructures, agricultural boundaries, rivers, natural resources, etc.	<ul style="list-style-type: none"> <li>• General information</li> <li>• Location of fields/fallow</li> <li>• Land classifications <ul style="list-style-type: none"> <li>- Local soil code</li> <li>- Shifting Cultivation</li> <li>- Forestry</li> <li>- NCR land + other land codes</li> <li>- Other land uses</li> </ul> </li> </ul>
Farm sketch	Farm sketch drawing provides us	<ul style="list-style-type: none"> <li>• Farm dimensions and boundaries</li> <li>• Topography and land use</li> <li>• Crops distribution</li> <li>• Location of home, livestock, etc</li> </ul>
Community and farm transects	It identifies community farm and determines some of its problems and potentials	<ul style="list-style-type: none"> <li>• Soil management</li> <li>• Types of crops</li> <li>• Water management</li> <li>• Infrastructures</li> <li>• Livestock</li> </ul>
Problem and opportunity ranking (Appendix G)	It can be used to identify problem and opportunity of individual or group of people in the community	<ul style="list-style-type: none"> <li>• Advantages and disadvantages of access to new road</li> <li>• Socio-economic differentiations</li> </ul>
Seasonal activities calendar	To identify livelihood tasks through out the year	<ul style="list-style-type: none"> <li>• Household production</li> <li>• Major crops</li> <li>• Other activities related to households</li> </ul>
Venn diagram	It represents important institutional interactions	<ul style="list-style-type: none"> <li>• Relationships between local community , institutional and policy environment</li> </ul>

### 2.4.2 Questionnaire, interviews and observation

To conduct any type of surveys in a rigorous and unbiased fashion it is important to adhere to specific procedures and apply them in systematic manner (Rea, L.M and Parker, R.A 1997).

Questionnaires are one of the research techniques and tools designed to extract relevant information from responders for descriptive surveys.

In order to develop both general and specific overview of livelihood strategies in the study area, we prepared a questionnaire in the form of semi-structured interview. The questionnaires will provide data both used for quantitative and qualitative analysis. The questionnaires contained open-ended opinion questions, multiple-choice questions as well as several quantitative tables to be filled in during the interview. The individual household questionnaire consists of four major segments. The first segment pertains to the demographic and social characteristics of the head of the household, spouse, and other family members. The second and third segment of the questionnaires pertains agricultural management practice and de-agrarianisation – which will cover a broader perspective on farming and rural livelihoods, income diversification and livelihood strategies. The final segment of the questionnaires related to socio-economic differentiation within the village. The questionnaires that will be used in Kampung Danu village are presented in Appendix E.

Appropriate identification of populations and the selection of representative sample(s) are important for any research design models (Black, T. R, 1999:110). The identified population in our research design are the population of the Kampung Danu village. From the available background information of the village provided by our Malaysian counter parts, the village consists of 49 households. Clearly, large samples will advantageous, give the relevance of sub-sample comparisons. However, the relatively comprehensive nature of the household surveys and time constraints will not allow us to a large sample.

A relatively small sample carefully selected may provide a more valid outcome than a large sample poorly chosen. Therefore, we considered 15-20 households as sample size and household as unit of analysis in our research design. The sampling procedure will be stratified sampling. The stratification will be according to households' income generating activities meaning that we will divide the households into three sub strata: households livelihood based on income from agriculture (e.g. crops), households livelihood based on income from off-farm (e.g. trading, labour, craft, etc), and households livelihood based on income from combination of on-farm and off-farm. The reason for stratification in the samples from Kampung Danu village is a desire to study possible differences among the households in terms of livelihood strategies, agricultural practices as well as socio-economic differentiations. The stratified sampling strategy can also ensure specific groups are represented in the samples. From a village headman, a list of all households can be obtained. A pilot test will be conducted before sending out the questionnaires to locate possible weaknesses of the questionnaire as well as possible modification in questionnaires.

We will carry out semi-structured interviews during the data collection phase. Three semi-structured interviews with three different levels with different purposes: one with village headman to gather information about the overall picture of the village (Appendix C); one with selected households in the fields to capture information about agricultural practices (Appendix F) and the final one with elderly person to get information about the history of land use in the region (Appendix D). Detailed questions guidelines for interviews are included in.

Finally, during the data collection phase, we will use observation techniques to capture many real life behaviors and situations. We assume that observations would yield data that are comparable on the inter-observer basis and hence can afford well-grounded generalization. The general possibility for recording observational data will be the use of field notes.

### **2.4.3 Soil sampling**

To understand the soil changes caused by agricultural practices, we will carry out soil samplings. We will like to know the impact of their soil management practices, by comparing soil that have been explored with those that have not been cultivated for a long period of time (soils at the boundary) from the same farm. We will also like to know the nutrient content and the quality of the plants grow by the farmers. By doing this we will know if more nutrients are taken out from the farming land than replaced or vice versa. This will be carried out as follows:

We will examine some chemical and physical features of the soil such as; Soil texture; soil color; soil pH; Soil Conductivity, Soil organic matter; etc. This we will give us knowledge about the soil type. Using this information, we are going to compare with the present situation to see if their agricultural practices have affected the soil quality. This study will also tell us about the input and output of nutrients.

Lastly, we will examine the plants to see if there are any symptoms of deficiency of nutrients. We will examine the older leaves for mobile nutrients (N, P, K, Mg) and examine younger leaves for nutrients (Mn, Cu, S, Fe, B, Ca). From these two studies we will be able to know whether the soil have been subjected to stress or not, and from that we will relate this out come with the emergence of the new road to see if the outcome of the road has any influence on the change in lands use.

### **2.4.4 Mapping and GPS tool**

According to our problem statement we will, among other things, map the existing natural resources available for the selected households. This is because the livelihoods in the households are dependent to some extent on natural resources. To perform a satisfactory mapping we will do some of the following:

1. Measuring the size of the area by using GPS and compass.
2. The position of the households interviewed
3. The position of the fields of the household from the field interviews and
4. Direct observations and transect walks

The advantage of using GPS when performing field studies, are that mapping of relevant data, can be viewed in a graphical interface i.e. a GIS. In case the GPS is incapable of performing area measurements, we will use string and compass if necessary.

The information from the GPS will either be uploaded to campusnet from Malaysia or to one of our computers for later processing. We anticipate to implement the data in a GIS after returning from Malaysia. The GPS data will then be combined with the information from the PRA sessions to help illustrate the various topics from the main research question and hypothesis

## **2.5 Methodological issues**

During our field research different methods will be carried out to answer the research question and to prove our hypotheses. The data we will obtain by using different methods might have some degree of risks of validity and reliability.

Problems of systematic bias in data collection may arise from two sources: interviewers and responders. In terms of interviewers, the main problem is the use of separate language. Different interviewers may have different ways of translating questions into the local language, and may also

interpret answers to qualitative inquiries in different ways. In terms of respondents, the main problem in this study concerns the sensitive nature wealth, land rights in area of Kampung Danu.

The mixed methods for triangulation are important. A number of methods will be used during the assessment process to triangulate information on livelihood strategies and the associated constraints and opportunities. Triangulation refers to the comparison of data among different sources of information to improve its validity and reliability. For example, information obtained from community map should be consistent with information obtained during community meeting or household interviews. However, triangulation can be critical to assess information because informants can sometimes easily manipulate open-ended discussions. To ensure the quality of the information, we will make our efforts to build in a number of checks across data collection techniques.

## **2.6 Cooperation with Malaysian counterparts**

From the counterpart synopsis we have identified the following common / shared research and interest areas. We are both focusing on the livelihood strategies and how they have improved. To examine this, we are both planning to use PRA methods such as interviews, community mapping and ranking etc. We will also be able to share some of our sources for data collection. In particular the data collection of soil samples and area measurements with GPS. Exactly how to do this will be clarified when we meet our counterpart in Kuching and try to find a common point of origin. A detailed information about the Malaysian counterparts activities can be found in Appendix I.

## **References**

Black, T. R. (1999). *Doing Quantitative Research in the Social Sciences. An Integrated Approach to Research Design, Measurement and Statistics*. Sage Publications Inc. New Delhi, Thousand Oaks, California 91320.

DFID (1999): *Sustainable Livelihoods Guidance Sheets*

Patton, M. Q. (2002): *Qualitative Research and Evaluation Methods*. Sage Publications Inc. New Delhi, Thousand Oaks, California 91320.

Rea, L.M. and Parker, R.A. (1997): Chapter 1, An overview of the sample survey process & Chapter 2, Designing effective questionnaires & Chapter 3, Developing survey questions & Chapter 9, Presenting and describing survey data. *Designing and conducting survey research: a comprehensive guide*. 2<sup>nd</sup> ed. Jossey-Bass Pub. San Francisco. Pp. 10 – 14, 27 – 62, 147 – 162.

## **Relevant Literature:**

Boserup, E. (1995): *The condition of agricultural growth. The economics of agrarian change under population pressure*. Earthscan Publications Ltd. London.

Cramb, R.A. (1992): *Shifting Cultivation and Sustainable Agriculture in East Malaysia: A longitudinal Case Study*. *Agricultural Systems* 42 (1993) 209-226.

Casley, D.J. and Kumar, K. (1988): *Measurement of crop production and yields* In Anonymous, *The collection, analysis, and use of monitoring and evaluating data*: 96-113. Washington D.C.: World Bank

- Hansen,T.S. (2005): Spatio-Temporal Aspects of Land Use and Land Cover Changes in the Niah River Catchment, Sarawak, Malaysia. *Singapore Journal of Tropical Geography*, 26(2), 2005, 170-190.
- Hovedfagskursus (1998): Livelihood Strategies and Resource Management. Three Case Studies from Nanga Sumpa, Sarawak. Institute of Geography University of Copenhagen.
- Jackson,B., Nurse,M., and Singh,H.B. (1994): Participatory mapping for community forestry. Rural Development Forestry Network Paper.
- King,V.T., Jali, N.M. (1992): Issues in Rural Development in Malaysia.Percetakan Naz Sdn. Bhd., Kuala Lumpur.
- Martinussen,J. (2003): Society, State and Market. A Guide to Competing Theories of Development.
- Mikkelsen, B. (2005). Methods for Development Work and Research. A New Guide for Practitioners. Sage Publications Inc. New Delhi, Thousand Oaks, California 91320.
- Paluso,N.L. (1992): The political ecology of extraction and extractive reserves in east Kalimantan, Indonesia. *Development ad Change*, 23(4): 49-74.
- Redford,K.H., Padoch, C. (1992): Conservation of Neotropical Forest. Working from Traditional Resource Use. Columbia University Press. New York.
- Rigg,J. (1998): Rural-urban interactions, agriculture and wealth: a southeast Asian perspective. *Progress in Human Geography*, 22(4): 497-522
- Turner,R.K., Pearce,D., Bateman,I. (1994): Environmental Economics. An elementary introduction. Chap. 3., 10., 11. Prentice Hall, Great Britain.
- Vincent,J.R., Rozali.M.,A. (2005): Maneging Natural Wealth. Environment and Development in Malaysia. Resources for the future, Washington D.C.

## Appendix A

### Concept Formation and Terminology

Commercial farming: Farming system in which almost all of the farm produce is being sold

Subsistence farming: Farming system where all the produce is used as food although some is sold to buy other food and household items that they can't grow.

Cash-crop systems: Farming systems which make use of only cash crops e.g. oil palm trees, Cocoa, Coffee etc.

Household: Includes the people who are living in the house. It includes their belongings, fields and animals.

De-agrarianisation: Diversification from agriculture activities to off farm activities.

Sustainability: covers different areas e.g. culture, social, economic and environmental etc.

The resources of these areas have to meet the needs of the people now and in the future.

Livelihood: A sustainable livelihood is a system which can overcome and recover from shocks and stresses. The extents of the assets which exist in livelihoods within the households or the community are determinant factors for the livelihood strategies in each household or community. A system which has high capitals in their livelihood are stronger and has better opportunities to overcome and recover from shocks and stresses according to physical, social, human, natural and financial factors than livelihoods with small capital.

#### Livelihood Assets:

This is the definitions of the different capitals which are used in the sustainable livelihoods framework (DFID, 1999: part 2.3.1-2.3.5) and our own further development of the terms.

##### Human Capital

- Skills (internal)
  - Adoptive skills; they know what functions but not why, lack of knowledge of how to implement new systems (%-education)
  - Education
- Knowledge and information
  - Channels of information (external)
    - TV
    - Computer
    - Organisations
    - Community meetings (inter village level)
  - Internal sharing of knowledge
    - Migrants/off-farm workers
- Ability to work
  - Cultural constraints (gender issues)
  - Number of available labour
- Health
  - Limited access to healthcare → vulnerable to diseases

##### Natural Capital

- Land
  - Access to arable land and other natural resources (hunting/gathering)
- Water
  - Available water resources
  - Irrigation
- Wildlife
  - Hunting and gathering
  - Wildlife used as pest control, medicine, rituals and religious areas. Religious areas can function as a gen-pool because the area is kept untouched.
- Biodiversity
  - Ecosystem stability by maintaining habitats for wildlife and plants.
  - Degrading biodiversity could lead to pests and new exotic insects.
  - Microclimate changes can occur due to canopy-cover changes etc.
- Environment

- Soil
  - Available soil types influence the possible build up of nutrients and will therefore influence the length of the needed fallow periods.
  - Erosion / landslides

#### Financial Capital

- Savings
  - Investment in livestock
  - Bank investment/account
  - Common savings for common goods (village level)
- Credits
  - Loans
  - Credit
- Remittances
  - Relatives living and working abroad or in Kuching and are sending money home
- Pensions
- Off-farm work
  - Relatives living in household, having additional income i.e. having a shop or as hired labour etc.

#### Physical Capital

- Transport /Infrastructure
  - Transport possibilities because of commercial production
  - Labour flows
  - Migration
- Shelter
  - Housing
  - Shelter for livestock
- Water
  - Channelled water to households and fields
- Energy
  - Generator
  - SESCO (Sarawak Electricity Supply Corporation)
  - Fuelwood
  - Gas
- Communication
  - Telephone
  - Internet

#### Social Capital

- Networks
  - Internal and external networking such as market/trade connections
  - Local community
- Groups
  - People in the local community which are helping in the process of slash 'n' burn and harvesting.
  - Gender
  - Age councils
- Access to institutions
  - Application for tenure rights
  - Agricultural transformation via SALCRA
  - Unions for agriculture (influencing decision making of MOA)
- Trust
  - Trusting "specialised knowledge" about best practices when implementing new agricultural strategies
  - Trusting the decisions of the headman



## Appendix B: Type of data, sources and data collection methods required to analyze research questions

Issues/hypotheses	Type of information required	Sources of information/data	Data collection methods
<i>The new roads has changed the agricultural management practice</i>	<ul style="list-style-type: none"> <li>• Size of fields holding, location of fields, tenure status</li> <li>• Farming system (shifting cultivation), subsistence, commercial</li> <li>• Cropping patterns</li> <li>• Inputs: labor and capital availability, fertilizer, pesticides, manure)</li> <li>• Productivity</li> <li>• Irrigation possibility (Is water a limiting factor?)</li> <li>• Livestock for farm work, animal traction</li> <li>• Mechanizations</li> <li>• Access to services provided by the extension service</li> <li>• Information on agricultural activities (e.g., crop patterns, seed selection, use of fertilizers, manure, pesticides)</li> </ul>	<ul style="list-style-type: none"> <li>• Village headman or village committee</li> <li>• Secondary data sources</li> <li>• Household informants</li> <li>• Local institutions</li> </ul>	<ol style="list-style-type: none"> <li>1. Individual household questionnaires</li> <li>2. Informants and semi-structured interviews with households in the fields</li> <li>3. Semi-structured interview with headman and elderly person</li> <li>4. Problem and opportunity</li> <li>5. Direct observation</li> </ol>
<i>The road leads to increased de-agrarianisation</i>	<ul style="list-style-type: none"> <li>• Number of people in a household which work off-farm</li> <li>• Type of work do they perform and are they using any relevant education</li> <li>• Did they work off-farm before the road was built</li> <li>• Income dependency on off-farm work</li> <li>• Type of transportation decreased travel time</li> </ul>	<ul style="list-style-type: none"> <li>• Household informants</li> <li>• Headman</li> <li>• Secondary data sources</li> </ul>	<ol style="list-style-type: none"> <li>1. Individual household questionnaires</li> <li>2. Semi-structured interview with Headman</li> <li>3. Direct observation</li> </ol>
<i>The new road has lead to social and economic differentiation within the village</i>	<ul style="list-style-type: none"> <li>• Benefits from the road in each household</li> <li>• Income</li> <li>• Savings</li> <li>• Market access</li> <li>• Market contacts</li> <li>• Sale of products</li> </ul>	<ul style="list-style-type: none"> <li>• Household informants</li> <li>• Secondary data</li> </ul>	<ol style="list-style-type: none"> <li>1. Individual household questionnaires</li> <li>2. Direct observation</li> </ol>

## Appendix C: Questions guideline for semi-structured Headman interviews

### Purpose

The purpose of the qualitative semi-structured interview is to investigate and obtain an insight community social structure and general information from village headman. The interview will be started by an introduction of us and our study and motivation for doing the interview.

### Interview questions to Households

Village:

Date:

GPS location:

N

E

Respondent:

Age:

Sex:

Name of HHH

Age:

Sex:

Marital status:

No. of children:

Size of HH:

Adults:

8-15:

0-7:

HH number:

Type of interview:

Semi-structured interview

Type of questions:

open-ended

Interview conducted by

Project group members with the assistance of interpreter

### Observations

### Questions guideline

1. How many families/households live in the village? Have there been any changes in number of households after the road was built?
2. Could you please point out some households, that are
  - a. Representatives for the village diversity (dependency in agriculture and off- farm-workers)
3. How has the new road benefited the village? What do you see as the most important improvement for the village?
  - a. Have the new road improved access to healthcare?
  - b. Other institutions like schools, markets etc.
4. How does the improved access to cities/markets influence
  - a. Migration
  - b. Off-farm work
  - c. Production of cash-crops

- d. Labour flows
- e. Transport possibilities
- 5. Which changes in agriculture have occurred after the new road?
- 6. How is off-farm work divided between men and women? Which group is having most off-farm work? Are there any tendencies in the division between men and women.
- 7. How is the education level in the village? Primary school, university, others, etc.
- 8. Does the community have any common goods such as vehicles for transportation?
- 9. How big an influence do different institutions/organizations/extension services have on the village?

We would like to take this opportunity to thank you very much for your time and cooperation

## Appendix D: Questions guideline for semi-structured elderly person interviews

### Purpose

The purpose of the qualitative semi-structured interview is to investigate and obtain an insight history of land use in the region from elderly persons. The interview will be started by an introduction of us and our study and motivation for doing the interview.

### Interview questions to Households

Village:

Date:

GPS location:

N

E

Respondent:

Age:

Sex:

Name of HHH

Age:

Sex:

Marital status:

No. of children:

Size of HH:

Adults:

8-15:

0-7:

HH number:

Type of interview:

Semi-structured interview

Type of questions:

open-ended

Interview conducted by

Project group members with the assistance of interpreter

### Observations

### Questions guideline

1. Can you remember how much new lands have been taken into cultivation for the last few years?

2. What is the total amount of arable land that was not cultivated as far as you can remember?
3. What are the reasons for not cultivating this land?
  - a. Machine cultivation is not possible because of steep elevation of the land
  - b. Machine cultivation is not possible due to the fragmentation of the holding
  - c. Due to poor quality/fertility of the land
  - d. due to the distance or the arable plot from the farmstead
  - e. Due to employment of the members of the household off the farm
  - f. Due to old age
  - g. Due to unorganized purchase of agricultural products and low purchase prices
  - h. The young people are not interested in farming
  - i. For the needs to my household, it is not necessary to cultivate the entire area of holding
  - j. Revenues from agriculture are too low
  - k. lack of Credit
  - l. Inability to hire labor
  - m. Other reasons \_\_\_\_\_
  - n. Cultivated all of the land.
4. What are the principal crops that you produced?
5. What is the length of fallow period?
6. Could you tell us whether you or other farmers used the following inputs for cultivation in the last few years?

Use of inputs	2006	2005	2004	2003	2002	2001	2000	1999	1998
Fertiliser									
Herbicides									
Insecticides									
Fungicides									

- 7 Could you tell us whether you own or have owned the following agricultural equipment in the years mentioned.

Agricultural equipment	2006	2005	2004	2003	2002	2001	2000	1999	1998
Plough									
Walking tractor									
Irrigation pump									
Rice thresher									

Code: 1 = Yes 0 = No

- 8 What is the difference in the size of the areas that you have used for the following crops between 2000 and 2006?

Crop	A. 2006 area was 1.Larger 2 Smaller 3 Same compared to 2000 4 crop not cultivated in these two years 5 I do not know
Irrigated rice	
Upland rice	
Irrigated crops	
Crops following rice (groundnut, garlic, onions soybean,...)	
Upland crops (cassava, groundnut,maize,...)	
Fruit and other tree crop	

- 8 What have been other major changes of land use as far as you can remember? Could you please draw a history of land use timelines?

We would like to take this opportunity to thank you very much for your time and cooperation

## Appendix E: Guidelines for semi-structured households questionnaires

### Purpose

The purpose of the qualitative semi-structured questionnaires is to investigate and obtain an insight from the selected households about the issues that are identified in our main research question and hypothesis. The interview will be started by an introduction of us and our study and motivation for doing the interview.

### Interview questions to Households

Village:

Date:

GPS location:

N

E

Respondent:

Age:

Sex:

Name of HHH

Age:

Sex:

Marital status:

No. of children:

Size of HH:

Adults:

8-15:

0-7:

HH number:

Type of interview:

Semi-structured questionnaires

Interview conducted by

Project group members with the assistance of interpreter

### Observations

### Questions guideline for interviews

#### Status

How depended are you of agriculture on a scale from 1-3? \_\_\_\_\_

Code: 1 is very dependent

2 is a combination of off-farm work and agriculture

3 is total dependency on off-farm work, no cultivated fields, but homegardens allowed

#### Agricultural management (only for use if the answer is 1 or 2 in the above question)

How many fields do you have? \_\_\_\_\_

Shifting cultivation \_\_\_\_\_

Commercial \_\_\_\_\_

Perennials \_\_\_\_\_

Do you apply intercropping or other multi cropping systems, please explain how?

What types of crops do you grow?

List the types of input after importance (1 most important, 5 least important)

Labour: \_\_\_\_\_  
Financial capital: \_\_\_\_\_  
Fertilizer: \_\_\_\_\_  
Pesticides: \_\_\_\_\_  
Manure: \_\_\_\_\_

Other important inputs: \_\_\_\_\_

How has the new road affected your production? \_\_\_\_\_

Have you changed the agricultural production? \_\_\_\_\_  
if yes how? \_\_\_\_\_

Do you have livestock? \_\_\_\_\_ Which? \_\_\_\_\_  
For which purposes? \_\_\_\_\_

Do you have any mechanics or modern technologies to help you with farming? \_\_\_\_\_  
Which? \_\_\_\_\_

Do you have any access to extension services as institutions and organizations which can help you with your agricultural activities? \_\_\_\_\_  
Which ? \_\_\_\_\_

How big an influence do services have on your agricultural activity? (Rank from 1 to 5 where 1 is very important) \_\_\_\_\_

**De-agrarianisation** (only for use if the answer is 2 or 3 in the status question mentioned above)

How many household members have off farm works?

Which kind of off-farm work do household members perform?

Where do they work? \_\_\_\_\_ Do they stay overnight? \_\_\_\_\_

Which type of transportation do they use to get there?

Did they work off-farm before the road was built?

How are the off-farm work divided between men and women? \_\_\_\_\_

Do you consider the household dependent on off-farm activities?

**Socio economic differentiations within the village**

Do you feel your household has benefited from the construction of the new road?  
If yes, how

How has the road affected your access to markets?

Where do you sell products?

Have the road given any contacts with established traders/markets? \_\_\_\_\_ If yes which? \_\_\_\_\_

Do the household have any savings \_\_\_\_\_ Where do you save your money (livestock, bank account, other)? \_\_\_\_\_

How much of the household income comes from off-farm work (percentage) \_\_\_\_\_

How much from agriculture (percentage)? \_\_\_\_\_

Which education do the household members have? \_\_\_\_\_

If they have an advanced education, how is it used in relation to off-farm work?

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We would like to take this opportunity to thank you very much for your time and cooperation
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## Appendix F: Guidelines for semi-structured households interviews in the fields

### Purpose

The purpose of the qualitative semi-structured interview is to investigate and obtain an insight from the selected households about their farming systems and practices. The interview will be carried out with the households which to a certain degree are dependent on agriculture. The reason to perform the interview in the field is to obtain information through our direct observations. The interview will be started by an introduction of us and our study and motivation for doing the interview.

### Interview questions to Households

Village:

Date:

GPS location:

N

E

Respondent:

Age:

Sex:

Name of HHH

Age:

Sex:

Marital status:

No. of children:

Size of HH:

Adults:

8-15:

0-7:

HH number:

Type of interview:

Semi-structured interview

Type of questions:

open-ended

Interview conducted by

Project group members with the assistance of interpreter

### Observations

### Questions guideline for interviews

How many hectare (ha) of land do you have? \_\_\_\_\_

How many fields do you cultivate? \_\_\_\_\_ How many ha each \_\_\_\_\_

Do you have fields under fallow? \_\_\_\_\_ if yes how many fields? \_\_\_\_\_

Have you shortened your fallow period? Y\_\_\_\_N \_\_\_\_ why? \_\_\_\_\_

How much is used of the following?

	Yes	No	Which fields/ crops	How much (units)
--	-----	----	---------------------	------------------

Fertilizer				
Pesticides				
Manure				

Other: \_\_\_\_\_

Could you please draw a crop calendar?

	J	F	M	A	M	J	J	A	S	O	N	D
Climate												
Rubber												
Pepper												
Cocoa												
Hill Rice												

Which crops have commercial value? \_\_\_\_\_

How much of your yield (percentage) are sold on market? \_\_\_\_\_

What determines which crops you grow? \_\_\_\_\_

Have you changed your choice of crops after the construction of the road? \_\_\_\_

If yes how and to which?

How is the quality of the soil in your fields? \_\_\_\_\_

If you have changed your crops after the construction of the road, has the soil quality improved or declined?

Do you in general have problems with Erosion? Y\_\_\_\_\_N\_\_\_\_\_

How do you irrigate the fields? Pumped water, from mountains or other? \_\_\_\_\_

Do you feel the road have improved your well-being as a farmer?

Do you have any others comments?

We would like to take this opportunity to thank you very much for your time and cooperation

## Appendix G: PRA method exercise program

### Purpose:

The purpose of carry out the PRA problem and opportunity ranking is to quickly identify main problems associated with poor infrastructures (mainly road) and opportunity associated with the access to new roads in the study area by group of respondents feel most important. The interview will be started by an introduction of us and our study and motivation for doing the interview.

### Venue:

GPS location

N

E

Date and Time:

Number of participants:

Male:

Female:

Age group

Facilitators:

### Problem and opportunity scoring and ranking

Problem	Respondents						Total score	Ranking
	A	B	C	D	E	F		

5=most important, 1= least important

## Appendix H: Time schedule

Date and place:	Assignment:	Litteratur topics:
19/2 2006	Questionnaires Timeschedule	Livelihoodstrategies PRA
20/2 2006	Background for study area Methodology <ul style="list-style-type: none"> <li>- Livelihoodstrategies</li> <li>- PRA (facilitation – Knowls learning cycle)</li> </ul> Groupwork planning Contact counterparts	DFID, Sustainable livelihoods guidance sheets. Biophysical info
21/2 2006	Hypotheses Questionnaires (follow up) Counterparts follow up	Relevant literature
22/2 2006	WORK!!! Determine field equipment needed Albarune included in group ☺	
23/2 2006	Hand-in of first draft at 12 am.	
24/2 2006	Synopsis feed-back and apply changes	Relevant literature
25/2 2006	Day off; Botanical garden ☺ and mosquito net	
26/2 2006	Work on synopsis	Relevant literature
27/2 2006	Group work with supervision	Relevant literature
28/2 2006	Group work with supervision	
1/3 2006	Hand-in of final synopsis; prepare presentation; buy gifts	
2/3 2006	Presentation of synopsis/ departure Christopher	
3/3 2006	Departure Signe/ arrival Christopher	
4/3 2006	Arrival Signe/ Meeting with counterparts	
5/3 2006	Meeting with counterparts; Departure Albarune	
6/3 2006	Departure Evert/Arrival Albarune. Transport to field area Own observations	
7/3 2006	Arrival Evert/ Presentation of common research project Field work - Headman Interview	
8/3 2006	PRA methods Transect walk; Community mapping	
9/3 2006	Semi-structured interviews	
10/3 2006	Semi-structured interviews	
11/3 2006	Field interview and collection of biophysical samples (soil, water etc.)	
12/3 2006	Day off / visit other groups	
13/3 2006	Follow up interviews with key-informants	
14/3 2006	Unforeseen activities i.e. measurement of fuel wood etc.	
15/3 2006	Follow-up of data, Data analysis	
16/3 2006	Last minute investigations; Data analysis	
17/3 2006	Debriefing and presentation of results	
18/3 2006	Transport to Kuching, farewell party	
19/3 2006	End of field course	
20/3 2006	Goodbye Christopher, Evert and Albarune	
21/3 2006		
22/3 2006	Group meeting data overview	
23/3 2006	Day off	

24/3 2006	Goodbye Signe	
25/3 2006		
26/3 2006	Project work	
27/3 2006	Project work	
28/3 2006	Project work	
29/3 2006 – 14/4 2006	-----	