Altered household livelihoods and land use following increased labour migration. A case study of Nanga Ruyak.

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Abstract

The Iban are an indigenous group of people in the state of Sarawak, Malaysia, who traditionally built their livelihoods around shifting cultivation of upland rice and other food crops, mainly for subsistence needs. However, during the last decades the Iban have faced numerous changes, which has impacting their livelihoods and livelihood strategies. Today, Iban land use is dominated by the cultivation of perennial cash crops, such as pepper and rubber, with shifting cultivation a declining activity. Furthermore, off-farm labour is of increasing importance and rural-urban labour migration is a common phenomenon in Iban societies. This case study is set in the small village of Nanga Ruyak, Sarawak, and looks to answer how increased labour migration has impacted the livelihoods and land use of households in the longhouse. By the use of an interdisciplinary approach focusing heavily on qualitative interviews with the villagers, this study finds that labour migration is a prevalent phenomenon in Nanga Ruyak where people employ a multiplicity of off-farm occupations. Labour migration have over time changed the composition of the longhouse. The population now mainly consists of elderly people, who are taking care of their grandchildren and the farming, while their children have moved to urban areas. The trend of migrating for labour increases at times where the pepper prices are low. Furthermore, the labour migration have caused a shift from the traditional wetland to hill rice.

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Other remarks

On Thursday the 28th of March, Hege Reime was involved in a severe traffic accident and was subsequently hospitalized. She has contributed to this report on equal terms with the rest of us but will not be able to defend the report on the 10th of April. We send her our best wishes for her recovery.

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1. Introduction

The Iban are a widespread indigenous group in north-west Borneo, occupying large parts of the Malaysian state of Sarawak of which they make up approximately 30% of the population (Ichikawa, 2007; Wadley, 1997). Most Iban live in the rural and interior regions and employ a range of traditional livelihoods that depend on the land, the forests, and their ecosystems (Yong & Pang. 2015). The Iban traditionally reside in longhouses (*rumah paniai*) and their livelihoods are mainly built around cultivation of dry rice in the swiddens cut from the forest within the longhouse territory. Rice cultivation is supplemented by activities such as mixed vegetable gardening, rearing chicken, fishing, hunting, and gathering of forest products e.g. fruits, vegetables, timber, rattan etc. (Wadley, 1997; Yong & Pang, 2015). However, according to Cramb (2007) small-scale societies such as the Iban have experienced a major transformation of their customary land use systems during the last decades, which has had a significant impact on their livelihoods. This transformation has occurred in the context of unprecedented population growth and movement, the expansion of transportation and global markets to onceremote rural areas. Moreover, the introduction and spread of new agricultural crops and technologies, and the increasing reach and power of the modern state also influenced the livelihoods of the Iban (Cramb, 2007).

Thus, the agrarian system of the Iban in the mid-19th century was characterised by shifting cultivation of upland rice and other food crops, primarily for subsistence needs. This had changed considerably by the year 2000, when land use was dominated by the cultivation of perennial cash crops, notably pepper, rubber, and oil palm, and shifting cultivation was a declining and relative activity (Cramb, 2007). Furthermore, off-farm employment was of increasing importance, and can today be characterized as a crucial livelihood strategy for the Iban (Cramb, 2007). Although farming is a dominant activity in the rural areas of Sarawak, increasingly, young people are seeking wage employment in urban areas (Windle & Cramb, 1997). Initially, due to low educational achievement, most rural school leavers could only expect to find unskilled employment in the service, manufacturing and construction industries. However, in time, with better education, off-farm employment has moved from manual labour to skilled labour. In 1970 84% of Sarawak's population was rural. By the year 2000 only 52% remained in rural areas (Hew, 2011).

For more than two decades, numerous studies have focused on the issues of diverse off-farm employment opportunities, emigration to urban areas and their effects on the Iban society. Hew (2011) points out that in Sarawak, rural men, especially the Iban, have a long tradition of migrating (*bejalai*) for employment and social prestige. However, a study by Soda (2001) found that an increasing number of women followed their husbands when they migrated and according to Hansen & Mertz (2006) Iban migration is no longer dominated by men as almost half of the migrated population is now composed of women.

(Soda, 2001) argues that a lot of longhouse dwellers are economically dependent on their children working in urban areas. According to Hew (2011) the waning ability of the rural communities to sustain a proper livelihood following a shrinking natural resource base have led to the flight of the rural population. The migrants moved to urban centres, neighbouring countries such as Brunei and Singapore, and sometimes to the Western World. This transition,

from small-scale farming to wage employment is, between other things, a result of the price instability of the cash crops on which these people rely (Hew, 2011). An alternative source of income such as remittances from cash-earning household members can cushion households against crises (Hew, 2011). Cramb (2007) argues that temporary wage migration can be a supplement to rural incomes or a survival strategy for poor households affected by the rural recession and pressed by processes of rural differentiation. Hansen & Mertz (2006) describe that despite increasing permanent migration, the migrant population generally maintains contacts with the longhouses through remittances to resident family members who tend the family's fields and dwelling. Thus, the migrants are an important part of a larger family-income strategy: the older generation typically stays in the longhouse, participates in farming activities and secures rights to the land while the younger family members migrate (permanently or periodically) and generate off-farm income. Therefore, the longhouse constitutes an economic and social safety net for the migrant population (T. S. Hansen & Mertz, 2006). Furthermore, Windle and Cramb (1997) outline how remoteness severely restricts access to employment opportunities and emphasize how road access in rural areas have the potential to facilitate rural development in various ways.

This research project examines how increased labour migration has influenced the household livelihoods and land use of the rural Iban population in Nanga Ruyak and thereby contributes to the literature on this topic. The project is built around the hypothesis that labour migration in Nanga Ruyak has increased since the establishment of a road in 2000, leading to changes in the agricultural practice and in the use of land, and to a diversification of livelihoods strategies in general.

Consequently, the aim of this study is to answer the following research question: How has labour migration impacted household livelihoods and land use in Nanga Ruyak?

This report is based on fieldwork carried out from the 28th of February to the 11th of March in the community of Nanga Ruyak located in central Sarawak (appendix 9.1). The data required to answer the research question were obtained by applying numerous methods including a structured questionnaire survey, various qualitative interviews, a number of PRA techniques, transect walks and Forest Resources Assessments (appendix 9.2).

The report will be structured in the following way. Initially, the concepts of labour migration, household livelihood and land use will be outlined in order to clarify how these notions have been used in this research. The second part of this report discusses the interdisciplinary methodological approach applied in the fieldwork. The third part is comprised of the research results focusing on i) labour migration and demographics and ii) agriculture and land use changes. Hereafter the results will be discussed in the light of secondary literature, followed by a reflective chapter on the research conducted. Finally, the report is concluded with a summary of the findings and the discussion.

2. Definition of central concepts

The definition of household livelihoods in this report is strongly tied up with a characteristic feature of Iban society, that is, the longhouse. Traditionally, these were elevated wooden structures built alongside a river or a stream, which could accommodate from 30 to as many as 200-300 people. The longhouse structure is an agglomeration of individually-owned apartments (bilek) and a common living and working area (ruai) (Cramb, 2007). In the case of Nanga Ruyak, the longhouse was comprised of 35 bileks, of which 25 were inhabited. Cramb (2007) defines the Iban household as "a family occupying a single apartment or room (bilek) in the longhouse" (p. 50) and calls it the primary corporate group in a society that lacks clans and lineages. The household members are those who share in production and consumption of food and income as well as sharing property rights, including the right to land. However, during the field work in Nanga Ruyak, issues connected to this notion of a household arose, as it turned out that a number of households would receive remittances from people who lived outside of the longhouse, and thus contributed to the household income while having their own household elsewhere. Furthermore, a number of the people working outside in the nearby cities, would return to the longhouse once or twice a month, while the people working offshore, would be gone for an extended time period such as half a year, whereafter they would return to stay in the longhouse until they were once again offered offshore work. Were these people part of the households? Gödecke & Waibel (2016) refer to this phenomenon as the problem of the residency criterion, and outline how many definitional problems in regards to households can be traced to dynamic household boundaries, particularly in areas characterized by frequent migration, where some members come and go several times during the survey period and further complicate the calculation of household characteristics. In Nanga Ruyak, for example, one villager was present at the first week of the research but went offshore to work during the second week of the research, which raised questions of whether or not he was part of a household, and the degree to which he participated in activities in the longhouse e.g. the agricultural production and decision making.

During the research, however, it became clear that the Iban had their own definition of a household, which was, according to the villagers in Nanga Ruyak, "those who contributed to the rice pot". However, this definition also raises questions such as whether it also accounts for household expenditures and whether those who might stay in a bilek, but not contribute to rice pot, would also be considered part of the household. Finally, it was decided that the definition of a household in this research would be comprised of those who stayed in the bilek on a weekly basis and still considered the longhouse their home, but also those who contributed to the household income with remittances from offshore or nearby work, and who would return to the longhouse less frequently. This definition was used as this research focuses specifically on labour migration, and therefore the intention was to capture as many activities as possible, including those not taking place in or around the longhouse, that were expected to be of great importance for the livelihood income.

The definition of a livelihood used in this research is from Chambers & Conway (1992) who describe how 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" (p. 6).

According to Scoones (2015) an analysis based on the livelihood perspective would typically portray a complex web of activities and interactions that emphasises the diversity of ways people make a living. More conventional approaches to looking at rural development usually have a focus on defined activities: agriculture, wage labour, farm labour etc. However, in reality, these different activities are combined in a complex network (Scoones, 2015). The emphasis on livelihoods in this research was chosen on the background that the villagers in Nanga Ruyak employed a number of different activities in order to "make a living", and the concept of livelihoods was therefore considered a good framework through which the extent and importance these activities could be investigated.

Especially labour migration was expected to be an important component in constituting household livelihoods in the longhouse. Although the Iban seldom entirely abandon the farm economy, the importance of wage labour has increased over the past decades. This is also the case in Nanga Ruyak where different types of labour migration are prevalent and has influenced the livelihoods and everyday life in the longhouse.

Finally, the concept of land use applied in this research is from (Lambin, Geist, & Rindfuss, 2006) who define land use as "the purposes for which humans exploit the land cover. It involves both the manner in which biophysical attributes of the land are manipulated and the intent underlying that manipulation, i.e., the purpose for which the land is used" (p. 4).

3. Methodology

This chapter provides an overview of the various methods applied during the fieldwork in Nanga Ruyak, along with explanations of the choice of method and description of usage (appendix 9.2).

Both qualitative and quantitative methods have been used through the approach of *triangulation* defined by Bryman & Bell (2016) as "the use of quantitative research to corroborate qualitative research findings or vice versa" (p. 306). This approach allows the collection of a more diverse dataset that can be compared and thereby verified, which gives a greater confidence in the data collected (Bryman & Bell, 2016)

3.1. Questionnaire surveys

As part of the research a questionnaire survey was conducted (appendix 9.3). Considerations on sample stratifications were not needed, as it was possible to get answers from the complete number of households. The questionnaire was administered as a questionnaire survey since the language barrier made it hard to make them self-administered. In the end, the questionnaire was done with 24 of the current 25 households, as the household head in one of the bileks was absent when the questionnaire survey was executed. The household head (*tuai bilek*) is attributed "primary responsibility in matters of household resource use and is the jural representative of the household heads would have the best overview of household economies and activities, and therefore were chosen as main respondents for the questionnaire surveys. The first objective of the questionnaire was to obtain a clear picture of who lived in the bilek. This process aimed at identifying the composition of different households, their age, their

occupation and educational level. However, due to the broad definition of household that the villagers had, it was decided to differentiate between those who permanently live in the longhouse and those who live outside but still contribute to the economy of the bilek. A subsequent chapter had the final goal of capturing how much land people owned and what they did with it. This chapter also recorded the hours of work that the respondent had to put into the different crops, their yields and the income they generated. A smaller section on the animals owned was also added followed by questions on activities such as hunting and fishing. Finally, the last part of the questionnaire dwelled more on the economies of the different households. In this chapter expenses, loans and different sources of income were recorded. All this information has then been fundamental to get a clear picture of the longhouse and its main characteristics.

3.2. Qualitative interviews

During the fieldwork three different types of interviews were conducted; the informal, conversational interview, the topic-focused interview and the semi-structured, open-ended interview, as defined by (Kumar & Casley, 1988). The types of interviews have essential differences that make them fit for different situations and contexts, so the applied interview type depends on a number of various aspects such as the knowledge pursued and the informant(s).

A semi-structured interview was carried out with the head woman (*Tuai Rumah*) of Nanga Ruyak early on in the fieldwork, in order to gain an overview of the history and the changes of the community, with a focus on land use and labour migration (appendix 9.4.1). An interview guide was made beforehand, which contained the topics of interest. This guide was followed to some extent, still leaving space for pursuing unanticipated information coming up during the interview. The advantage of making this kind of interview with the head woman early on was that it offered a good insight into the community and what themes to develop further. When making interviews with people of power, in this case, the head of the community, using a more formal style when interviewing can also be a way of showing respect of their status. The semi-structured interview was followed up on through conversational interviews where knowledge gaps were further investigated.

Another semi-structured interview was done with a young woman who normally lived and worked in Sibu but returned to the longhouse for a visit, during the research. This was a good opportunity to get some more knowledge about the life of the labour migrants and her reflections on the topic (appendix 9.4.2).

The semi-structured interview type was only used this one time, as it is a very formal type of interview. This creates a specific kind of atmosphere and might even result in the locals feeling that the researcher was only trying to 'get something out of them'. Therefore, a more informal setting was preferred for the other interviews in order to create a more safe and trusting environment and to facilitate a more smooth conversation with the freedom to dwell on details that excited the respondents (Kumar & Casley, 1988, p. 12).

Therefore, the main interview types used was the topic-oriented and the informal, conversational type (appendixes 9.5.1-9.5.5). The informal, conversational interviews were conducted with most of the people in the community to provide an insight into the different

livelihoods and their characteristics. This type of interview also served to build trust and gain acceptance in the community by showing interest in their lives in an informal manner. The topic-oriented interviews were used to develop specific topics of interest in the community and to the central research question. Topics developed through this style was, amongst others, farming, land use, labour migration and personal life.

3.3. Participatory observation

In order to gain a more complete picture of the community of Nanga Ruyak and the activities of the inhabitants, participatory observations of relationships, interactions and traditions were carried out. Throughout the fieldwork, relevant observations were recorded as field notes to be used as a source of reference for the subsequent analysis. For example, a trip to the Julau Bazar was done together with the head woman, in order to see the marketplace, the people who go there and the interactions taking place. Another trip was made, also with the head woman, to the rented flat land paddy (*padi paya*) in the Durin people's land. Experiencing these surroundings and participating in the rice harvesting gave a bodily insight into the interaction and interrelations than the longhouse.

3.4. Focus groups

During the research, two focus group interviews were executed with different people.

One focus group was done with three members of the executive committee of the longhouse (*the JKKK*) in order to record the history of the longhouse from the time it was established until the present day (appendix 9.6.1). The specific committee members were chosen after consulting the head woman on the basis of their position in the committee and their expertise and knowledge. Unfortunately, only three of the planned participants were able to take part even after rescheduling multiple times. The three participants were the head woman, one of two advisors and the secretary. The focus group interview was done using a timeline approach, meaning that before doing the interview an interview guide with questions regarding changes over time was prepared. The questions covered themes such as land use changes, market prices, trends, shocks etc. During the course of the interview, the different events were plotted into a timeline to gain an overview of what happened at different times (appendix 9.6.1.1). With the timeline as a point of departure, the conversation produced a lot of related information and all of this was recorded in a separate text document for further use.

The second focus group interview was done in order to fill a knowledge gap concerning pepper farming. The structured survey showed that many farmers in the longhouse were still cultivating pepper, even though this crop is considered quite labour intensive and presently sells at a low price (figure 7). A need to look into challenges and motivations for cultivating pepper was therefore established and in order to do this, a group of four pepper farmers were asked to participate in a focus group interview (appendix 9.6.2). This focus group interview had three main focal points. Firstly, the farmers were asked to think of any challenges they meet in the process of cultivating pepper. This was meant as an open brainstorm were anything they could think of was written down on a note so that in the end all of the challenges were written on an individual note and placed on a big paper. Secondly, the farmers were asked to

determine which of the mentioned challenges were the most important, or rather what were the biggest difficulties for them (appendix 9.6.2.1). Finally, after talking about challenges and with this focus in mind, the farmers were asked the following question: "Baring in mind these challenges, why do you continue to cultivate pepper?"

3.5. Participatory Rural Appraisal (PRA)

A number of different PRA techniques were employed in order to engage the local people in the knowledge production and to make them active participants in the research project. The following techniques were used.

3.5.1. Transect walks

Four transect walks were executed during the fieldwork in order to observe different types of resource use and land use practices, of which three were to the forested area on the far side of the river, and one to the fields and gardens in the area behind the longhouse (figure 5). The transect walks in the forest were useful in terms of gaining insight in the present use of forest products by the Iban and they also provided information on how the land use in this area had developed over time. Furthermore, these transect walks were used to identify the areas in which it would have been interesting to conduct the FRA. On the other hand, the transect walk to the fields could provide insights on land ownership and land use e.g. that eggplants endemic to the area were also cultivated in the pepper fields and that some villagers had small fish ponds between their fields. Furthermore, Global Positioning Systems (GPS) were used to a great extent during the walks. Tracking the transect walks and marking important areas and spots, provided an insight into the present and earlier land use in the area surrounding the longhouse and was also very informative in regard to the villagers' mobility patterns.

3.5.2. Seasonal calendar

A seasonal calendar was developed together with the villagers, showing when different crops are planted, fertilized and harvested (appendix 9.7). It also showed weather conditions such as wet and dry periods, and flooding. This was done to get an idea of the workload required at different times of the year in order to cultivate different crops and in this way gain knowledge about the workload of different households by looking at it in relation to the surveys.

3.5.3. Participatory mapping

Participatory mapping of the area was also used to gain an overview of the area, land ownership, crops and land use changes (appendix 9.8). This was conducted with a group of the local people who were asked to draw on a map the location of the land owned by the villagers and the crops that they cultivated using predetermined symbols for each crop.

3.6. Forest Resource Assessment

The natural science method Forest Resource Assessment (FRA) was used in order to understand how the changes in the use of land over time had influenced the biodiversity and biomass of the forest. By comparing to types of forest – primary forest without major trees and old secondary forest with rubber trees on former rice fields – the aim was to gain insight into how the cultivation of the forest and the extraction of forest resources by the Iban, had influenced the natural resource base of the forest. The places were the FRA was conducted were chosen during a transect walk to the far side of the river. Here, two plots of 20x20 meters were measured and the trees within these plots, which had a diameter of more than 10 cm, were measured.

4. Results

4.1. Study area

The Iban longhouse settlement Rh Rengayan is located approximately 3 km from Julau bazaar on Nanga Ruyak, a small tributary of the Kanowit River (figure 1). An asphalt road built in 2000 leads to the longhouse and connects it with a wider infrastructural network of roads linking it to larger urban centres such as Sibu and Sarikei. The population in the area is ethnic Iban. At the time of the research, there were 98 people currently living in the longhouse with another 64 contributing to the household economies from outside, coming back to visit once a month or during festivities. Only 25 of the 35 bileks were occupied, as labour migration left many of the bileks empty.



Figure 1. Nanga Ruyak and the surrounding area in 2016. Adapted from Google Earth.

4.2. Labour migration

The first reports of labour migration in Nanga Ruyak date back to the 1960s, when the first men were employed in the rising oil and gas industry. Today, 23 of the 24 bileks have household members working outside the farm and on average 2 people from each household have off-farm labour (figure 2).



Figure 2. Household members working off-farm and monthly remittances on household basis. Source: Questionnaire survey.

Nowadays, people from the longhouse are mostly employed in skilled or semi-skilled labour (e.g. as waitresses, chefs, mechanics etc.) in the urban centers of Sarawak with a minority still employed in the oil and gas industry for seasonal work on offshore platforms. At the time of this study, 95% of the households received remittances either in the form of monetary contributions to the households or in the form of food and durable goods. These remittances are the primary source of income for 45% of the households in the longhouse and only 20% of the households still has agriculture as their main income source. This paradigm seems to be consolidating as the aging population of the longhouse is less and less able to carry out, and survive off, the manual labour in the pepper and rice fields. As 95% of the household's heads are above 50.

The changed livelihood strategies have in turn altered the demographics of the longhouse. With a majority of the people in the age groups 19-35 and 36-50 migrating for labour, 70,83% of the people staying in the longhouse every day of the week are either under 18 or above 50 (figure 3). From further interviews and participatory observations, it appeared that the people in the second age group who remain in the longhouse are mostly men, making up 74 % of this age group, 45 % of them unemployed. On top of this, labour migration, between other factors, made it so that only 9 % of the total population is between 36-50 indicating



once again the lack of working age population affecting the livelihood strategies of the households in the longhouse.

Figure 3. The graph shows the different age groups of the longhouse distributed on the two genders. Source: Questionnaire survey.

*98 people inhabit the longhouse of Nanga Ruyak but the graph only covers the 96, as the age of two of the females was not collected and therefore are outliers.

Most of the elderly people staying in the longhouse have themselves migrated for labour earlier in life and now have returned to the longhouse to take care of the family land and their grandchildren. The younger people who still migrate for labour leave their children in the longhouse, as the school tuitions in rural areas are cheaper and the grandparents have more time to care for the children. During interviews, the elderly did not seem preoccupied by the migration of the younger generation. Leaving the longhouse to provide for the family is seen as a normal step in the life of young Iban. In fact the older generation was confident that the labour migrants would come back to live in the longhouse one day, as they did themselves and as it has been done for generations, as they stated: "It is impossible to leave this longhouse empty".

4.3. Agriculture and land use changes

Land use changes in Nanga Ruyak is strongly connected to the agricultural practices applied by the villagers. The area surrounding the longhouse was used and cultivated in various ways, although the most common crops are pepper, rubber and rice. According to the villagers the area on the opposite side of the river mainly consisted of secondary forest with rubber and fruit trees, along with some small pepper plantations (figure 4). During transect walks through the forest on the other side of the river, it became clear that these forested areas were used in numerous ways. Some villagers would go there to pick edible herbs and fruits such as durian, inkabang and rambutang and an array of plants for medical purposes. On top of this, the area was used to collect snails in the river or to find honey. Furthermore, valuable trees such as Inkabang and Balian, that were used for building houses and as pepper poles, could be found in the area. Members from 6 households would go hunting for e.g. monkeys and wild boar, while 13 household were fishing in the river, either for their own consumption or in order to sell the fish at Julau's bazaar.



Figure 4. Map over Nanga Ruyak showing land ownership and land use. Yellow: Oil palms. Pink: Rubber trees. Orange: Pepper. Black: Fruit trees. Red: Rice. Green: Cocoa trees. X: wild trees. Source: Participatory mapping.

The area behind the longhouse and along the road was a mosaic of small plots owned by different villagers, who cultivated a broad variety of crops such as cocoa, mango and pineapple, and small rubber- and pepper plantations. These findings were supported by a transect walk through the area, which also revealed that some villagers had small fish ponds and shacks for chickens and pigs (figure 5). One villager also had an oil palm plantation by the road with three-year old oil palms. Besides collecting fruits in the forest, all households except one, had fruit orchards, whereof the majority were located near the longhouse or near the road as small plots, which can also be seen in figure 4.



Figure 5. Transect walk in the area behind the longhouse with the most important forms of land use marked by points. The map is from 2019. A. End of the gardens behind the longhouse. B. Mango gardens. C. Forest clearing. D. Pepper fields. E. Shack for chickens and pigs. F. Young rubber plantation. G. Rubber and pepper plantations. H. Fish pond. I. Pineapple fields. K. Rubber plantation. L. Pepper plantation. M. Hill rice. N. Forest. O. Pepper and local eggplant. P. Palm oil plantations (belonging to another longhouse). Q. End of palm oil plantation. R. The main road. S. Oil palm plantation belonging to a villager. T. Old rubber plantation. U. Hill rice and ill pepper plants. Source: Transect walk with GPS during the research period.

However, the main crops cultivated by the villagers were pepper, rubber and rice (figure 6a-6d). Eight households grew all three of these crops, while four households grew rubber and pepper, and four households grew pepper and rice (figure 7). Five households cultivated rubber only, while one cultivated pepper only, and two had no crops at all. This suggested that many households choose to diversify their agriculture. As shown on figure 4, rubber was a widespread crop and when many villagers were growing rubber only, it was in order to secure their land. Many villagers explained that if they left the land fallow, the government would claim the land, as in Sarawak, land must be cultivated in order to be owned. Therefore, many would plant rubber, which require little maintenance, and thereby secure the land. The villagers could then just wait to tap the rubber until the price would rise.

Figure 6a. Hill rice.	Figure 6b. Pepper plants.		
Figure 6c. Wetland rice	Figure 6d. Rubber tree		
Figure 6a-6d. The main crops cultivated by the villagers in Nanga Ruyak. Source: Photographs taken during the research period.			



Figure 7. Distribution of households cultivating pepper, rice and rubber. Source: Questionnaire survey.

4.3.1. From hill rice to wetland rice

In Nanga Ruyak the farmers distinguish between two different types of rice, the sort grown in the hills, padi bhuket, and the sort grown in flat, swampy areas, padi paya. The terrain around Nanga Ruyak is hilly and therefore the rice cultivated in this area is hill rice (figure 8a). This type of rice cultivation was gradually abandoned after the establishment of the road in 2000 and the former hill rice farmers shifted to various types of crops. A lot of them started renting land in another area, in order to cultivate wetland rice, a shift that was fuelled by several factors. This means that now, out of the twelve people that cultivate rice in Nanga Ruyak, eight cultivate wetland rice while only four continue to cultivate hill rice. The four people who still cultivate hill rice are the ones whose fields a relatively close to the longhouse and the road, as it is shown in figure 4. Observations show that it was mostly women who tended to the rice fields, while their husbands would be earning an income through other pursuits. Since the 1960's most rainforest's lowlands in the island of Borneo have been exposed to logging but according to the people of Nanga Ruyak, the area around the longhouse was not directly affected (Labrière, Laumonier, Locatelli, Vieilledent, & Comptour, 2015). Still, the indirect consequences of logging in the surrounding areas, has been that wild animals living in forests exposed to logging have fled to this area. This has caused an increased amount of animals pestering the rice fields in the forested hills, which made the cultivation more demanding and insecure. In addition, it is easier to keep away animal pests in lowland rice fields, because pesticides can be used more intensely than in the hills.

With most of the young people leaving the longhouse to work off-farm, the regular farming is for a big part left to the elderly people. With the old age, low stamina and physical challenges such as bad knees or different health conditions, made the hill rice cultivation too demanding. The lack of road access to where the hill rice fields used to be, means that to go

there you have to first cross the river by boat and then walk 2,6 km up an elevation of approximately 125 m, and all the harvest must be carried back manually (figure 8a). Because of the long trip, the farmers used to stay in the hills for long periods during harvest, as it made little sense to go back and forth every day.

After the establishment of the road, other areas have become more convenient for rice cultivation. This has caused a lot of the farmers in Nanga Ruyak to make a shift away from hill rice- to wetland rice cultivation. They can do this in a nearby area called Durin, where they rent land from relatives at a favourable price - they can choose between paying 100 RM a year or they can pay in rice. Some of the informants mentioned that the land they rented actually belonged to the people of Nanga Ruyak before the road access, but they sold it to their relatives in Durin because, back then, it was too inconvenient to reach (figure 8b). They now have to rent it back, as the owners want to keep the land in case prices of crops start increasing and they want to use it for their own cultivation.



Figure 8a. The route from Nanga Ruyak to the ex-hill rice in the forested area across the river. The route is approximately 2,6 km, including the distance travelled by boat. Source: GPS used during transect walk.

Figure 8b. The road to the wetland rice fields from Nanga Ruyak and the old road to the hill rice fields in the forest. The trip to the fields is approximately 26 km, when travelled in car. Source: GPS used during travel to the rice fields.

As the wetland rice is grown in a swampy area, the soil here is considered more fertile and the rice of higher quality, which makes it possible to sell it at higher prices. This did not seem to be one of the main drivers though, since only three of the rice farmers actually sold their rice. Rice differs from other crops cultivated in the area, because it is still used primarily as a food

crop. This means, that while choosing between different types of cash crops is mainly determined by market changes and price fluctuation, choosing a specific rice sort is determined by other properties such as personal taste. Actually, a great emphasis was put on the rice as a personal trait: It was very important to the rice farmers that their guest tasted not just any rice, but *their* rice.

Rice as identity factor: Since most of the farmers don't sell the rice, they plant the sort that they like best personally. It becomes a question of personal taste. Whenever we have a new cook preparing our food they bring their own rice for us to taste. There seems to be some kind of a personal identification with one's rice.

Observation from a topic-oriented interview w. female wetland rice farmers.

4.3.2. Pepper farming

In Nanga Ruyak, 17 of the surveyed 25 households cultivated pepper at the time of the research. One of these households only cultivated pepper, while four cultivated pepper and rubber, four cultivated pepper and rice, and eight households cultivated both rice, rubber and pepper (figure 7).

Fluctuations in the pepper price is of great importance for pepper farmers and had a profound influence on the pepper farming in Nanga Ruyak, where the pepper is sold directly to pepper boards or to the Chinese in the Julau bazaar. In the Sibu area, the black pepper price dropped from 26 RM/kg in 2015 to 9 RM/kg in 2019 (MPB, 2019), which is the lowest price since 2010 (figure 9).



Figure 9. Average annual pepper price (RM/kg) in Sibu in the period 2000-2019. The yellow line represents white pepper, while the black line represents black pepper. Source: The Malaysian Pepper Board, 2019.

A number of the farmers in the longhouse complained about the falling prices of pepper. When, during a focus group interview, a number of the pepper farmers were asked to rank the challenges they face in connection to the cultivation of pepper, fluctuating prices were overall identified as the biggest challenge (table 1). The farmers said that they could manage the other

challenges, but had no influence on varying prices. In years where the prices were low, so would the profit be, as fertilizers and pesticides would cost the same, and the farmers would still have to pay 30 RM per day to each of the workers they employed during the pepper harvest. The farmers emphasized that pepper cultivation was an unstable business, as they state that some years ago they would get 30 RM per kilo for black pepper, but today they would only get 8 RM per kilo, and with such low prices, the effort was not worth the earnings.

Table 1. Ranking of challenges connected to cultivation of pepper by pepper farmers inNanga Ruyak, 2019. Source: Focus group interview.

- 1. Fluctuations in the price on pepper.
- 2. To avoid the fungus that attacks the stem and the roots when the pepper is ripe.
- 3. To find enough people who can help in the fields during the pepper harvest.
- 4. To cultivate pepper is labour intensive, especially during the harvest, as you need to harvest it very fast. Time pressure during the harvest is therefore also a challenges.
- 5. To avoid insects that attacks the shoots of the new plants. These insects are very difficult to get rid of although they can be sprayed with insect spray.
- 6. To find the Belian wood that is used for the poles for the pepper plant to grow upon. This tree sort is very rare, and therefore very hard for the villagers to find and very expensive to buy.

7. The weather. Pepper plants require a lot of sun and in years with lack of sunshine, the pepper is attacked by the fungus more frequently.

8. To find areas with the right soil type.

However, given that 17 out of 25 households were still cultivating pepper, it seemed like pepper farming still constituted a major contribution to livelihoods in Nanga Ruyak. The pepper farmers were therefore asked why, considering the many challenges connected to pepper cultivation, so many villagers would still grow pepper. They replied that they wished to maintain the pepper plants in case the prices would go up in the near future, and that many people would store the pepper, that could be stored for a maximum of two years, while waiting for an economic upswing. They added that they had experienced these fluctuations in pepper prices a number of times and were sure that the price would go up eventually. Also, many villagers cultivated other crops such as chili and eggplants between the pepper, because they are ageing and do not want to start over with new crops. They are very familiar with pepper cultivation and already have the fields with the Belian wood poles. They just need to maintain the fields and sometimes their kids will help them when they return to the longhouse during the weekends. When the prices were high in 2014, pepper would be the most important source of income for the households, as 100 kilo could easily be sold for 3000 RM.

However, now, with the falling prices, other income sources such as cultivation of other crops and off-farm labour have become more important.

4.3.3. Forest resources

The FRA showed that the secondary forest with rubber trees growing on ex-rice fields, which was the most common land use type in the area, had a higher forest biomass than the primary forest (table 2). This was caused by the fact that the Iban had cut down the major trees (e.g. Inkabang trees) in the primary forest. This is also reflected by the smaller tree diameter (14.57 cm) in the primary forest compared to the secondary forest (19.07 cm). This difference could also be due to the location of the primary forest on the top of a hill, where there are less nutrients in the soils and the trees take longer to grow. However, the primary forest had a higher forest diversity, even without the major trees, than the secondary forest.

Table 2. Result of FRA carried out in two spot, secondary forest with rubber treesand primary forest without major trees, respectively. Source: Forest ResourceAssessment.

	Primary forest without major treesSecondary forest with rubb trees	
Plot size	400 m ² (20 x 20 m)	
Forest biomass	98.06 Mg/ha	162.68 Mg/ha
Forest diversity	3.15	2.13
Average diameter	14.57 cm	19.07 cm
Number of species found	41	38
Most abundant species	Medang, <i>Dacryodes</i> sp. Rubber, <i>Hevea brasiliensis</i>	

5. Discussion

This research shows that labour migration has impacted the livelihoods and land use of the community of Nanga Ruyak in various ways. It appears evident from the number of households receiving remittances (23 out of 24) and from the reliance that some families have on this source of income that labour migration is the predominant livelihood strategy for the people in the longhouse. However, without any baseline data it is difficult to plot this phenomenon through time if not with the use of the existing literature. Already in 2007, Cramb (2007) mentioned the growing importance, in the economy of the Iban families, of the income generated by family members working in urban areas and sending back part of their earnings. In another study, Hansen (2005) recorded that the wage employment had rose 21% from 1970 to 2001 in her study area, showing the rapid increase of this trend. One clear effect of labour migration was seen in the demographics of the longhouse. In the results it was outlined how off-farm work resulted in the lack of working age population tending to the fields. However, when questioned on the gradual aging of the people staying in the longhouse the villagers did not seem worried. According to them the last generation of labour migrants would in the future return to the longhouse as it has been the case in the past. Nonetheless, when some of the people living in urban centres were asked whether they would come back not all of them seem so sure. In the literature, Soda (2001) had also detected the same trend:" According to personal interviews with the registered household heads who had been successful in obtaining stable residence in Sibu, 55,3% of them revealed their intention to return to their home longhouses" (p. 156). However, it could be discussed that with the changing needs of the new generations this number is expected to decrease. On the other hand, the cheaper and more tranquil life of the rural areas together with the emotional attachment to the long house are still important factors to be considered.

During the research and during the subsequent work with the data, it was quite clear that one of the biggest challenges was to capture the difficulties that this longhouse had experienced over the last years, especially in terms of land use. The aging population, doubtlessly connected to labour migration, had affected the location of the rice fields, which moved from the hills to the wetlands, following the building of the road in 2000. However, detecting changes concerning pepper cultivation and other forms of land use was more difficult.

Studies such as Mertz, Egay, Bech Bruun & Svan Colding (2012) found that pepper farming had been abandoned by some Iban communities, as it was considered too labour intensive and required too many inputs to maintain a good production once the government subsidies stopped. This is not the case in Nanga Ruyak, where pepper farming still constitutes a major part of their livelihoods. According to the villagers they would stick to this crop because they are familiar with the crop, and because they were waiting for the prices to go up. Although many challenges are connected to this crop, they continued to grow it, as they are sure that at some point, the prices will rise again. The farmers were used to price fluctuations and declared that it would only be a matter of time. Meanwhile, they generate income from other types of crops or off-farm labour.

Wadley & Mertz (2005) emphasize that a strong inverse correlation exists between male absence on wage labour journeys and pepper prices. In the longhouse of Sungau Sedik, Wadley

& Mertz (2005) found that during pepper price surges in the late 1980s and the late 1990s, men stayed home to cultivate pepper, conversely, when prices dropped, men returned to longdistance wage work. This suggest that labour migration might not impact pepper farming, but that market forces, in terms of fluctuations in pepper prices, might actually influence labour migration. Since no long-term data about Nanga Ruyak is available it is very difficult to say whether this tendency also accounts for this longhouse. However, some of the villagers emphasized that when the pepper prices were higher, some of their children would return to the longhouse to help with the agriculture and the villagers would expand their fields. Also, some of the unemployed villagers who were looking for off-farm jobs, described how that was not the case some years ago when the pepper prices were higher.

In Nanga Ruyak, pepper is cultivated to generate income. However, due to the low prices of this crop in recent years some villagers described the earnings from pepper as side income. On the other hand, the literature just mentioned, and the accounts of the elderly in the longhouse might suggest that the pepper prices have an influence on the extent to which the villagers seek for off farm jobs. Thus, market forces and price fluctuations can be seen as drivers of labour migration. Nonetheless, as stated before, the livelihoods of people are affected by numerous agents and different internal and external forces that often result in their cause and effect relations to be blurry or intertwined.

While the cultivation of cash crops such as pepper seemed to be heavily influenced by market changes determining the attractiveness of this kind of farming, cultivation of subsistence crops such as rice and orchard fruits appear to be happening at a relatively steady pace. This is because the subsistence crops were kept as a side affair in addition to cash income activities, serving as security for the household. This is supported by (Cramb, 2007) who points out that it was a common livelihood strategy in many Southeast Asian societies to engage opportunistically with global markets, while continuing customary subsistence pursuits. "no matter how well off [the Saribas people] became, they did not abandon rice growing. Rice means security" (Sather in Cramb, 2007, p. 13). Nevertheless, Cramb (2007) states that with the increasing amount of young people going to school and continuing to emigrate from the longhouse to work in the urban centres, ensuing this strategy has become harder and harder. This is especially related to the lack of skill and ability needed for the hill rice cultivation, but also the increasing population of wild animals in unutilised secondary forest (Cramb, 2007). As mentioned in the section about rice cultivation, both of these explanations were also given in Nanga Ruyak, when questioned about abandoning hill rice. In Nanga Ruyak though, the opportunity to rent the land in Durin, requiring less effort, has made it possible for the people of this specific longhouse to maintain this strategy. This is also connected to the more effective use of pesticides in flat areas than in hill areas making it easier to keep away animal pests.

As the hill rice were left in favour of the wetland rice, areas in the forest were left fallow. However, in order to secure the land, many of the villagers planted rubber. Thus, the forested areas have seen some changes following labour migration as it has changed from hill rice fields to rubber plantations, that gradually turned into secondary forest. The FRA shows that the forest resources has been influenced by the ways the Iban use the forested land, as the secondary forest has a higher biomass but a lower diversity than the primary forest. This however, could also be caused by the location of the primary forest on the top of a hill and also the fact that the Iban has cut down trees. However, the cutting down of the primary forest in order to cultivate rice most likely took place before labour migration was a prevalent phenomenon in Nanga Ruyak, and therefore the transition from primary to secondary forest is not directly connected to the increased degree of off-farm labour.

6. Reflections

The following will contain reflections on the choice and application of different methods and concomitant discrepancies and weaknesses in the data. Also, other challenges to the collection of data will be considered.

6.1. Methodological reflections

6.1.1. Questionnaire surveys

As the research was carried out with an interdisciplinary approach the experience and backgrounds of the research group caused methods to be applied in a variety of ways. Because of the language barrier the questionnaire surveys had to be conduct as structured surveys (Kumar & Casley, 1988, p. 54). The is means that the questionnaires have been filled out differently and therefore the data was harder to compare.

Most of the people in the village do not have a complete overview of their expenses and their different income sources. Thus, the answers given in these regards are not completely reliable. When calculated, many of the numbers did not add up. For example, if the income from the different agricultural crops are put together, they do not always correspond with the number revealed later in the questionnaire, when the participants were asked about total income from agriculture. A similar issue is related to questions about hours of work; a lot of the villagers did not seem to have an exact count of how much time they spend working in the fields and such. On top of this, the time spent in the field is not evenly distributed in the same way as a pay job and was therefore harder to quantify. The work is concentrated in short high-intensity periods around the harvest and depend on the season.

Moreover, when asked about their crops in the agriculture section many of the villagers also listed their orchard fruits as crops. Therefore, if the questionnaire had to be conducted again, it would be recommended that orchard fruit should be included under 'agriculture' and not 'activities'.

In the section on 'income', questions on pension were not included and therefore there is no data showing whether or not the respondents had an extra income source in this. Also other sources of income may not have been reported because of unexplored factors.

6.1.2. Qualitative interviews

As qualitative interviews take up a lot more time than questionnaire surveys they could only be done with a limited amount of people. This means that the voice of some of the local people are more represented than others, which might draw a crooked picture of relations in the longhouse. According to Bryman & Bell (2015) researchers often rely heavily on informants,

especially those who develop an understanding of the research and are able to identify situations, events or people likely to be helpful to the investigation. This was also evident in the case of this research. Undue reliance on a few chosen people can lead researchers to see social reality through their eyes rather than from the perspective of several group members or, as in this case, the longhouse as a whole.

6.1.3. Participatory observation

The participant observation of this research was heavily influenced by the position of the group in the field, which has been developed in the section on 'positioning'. This was a deciding factor on where, and when, it was possible to observe and participate during the stay in the longhouse.

One of the big challenges of participant observation is the degree of participation, for example when it comes to personal boundaries of the researcher(s). It is a constant negotiation when to comply to something and when to deny, as you have to be very cautious to not appear impolite and insensitive to cultural traditions and the like. An example of this was concerning the consummation of alcohol: it is a big part of Iban culture to be very hospitable which is shown through the generous offering of food and drinks whenever one visits a household. This meant that at times quite excessive amounts of alcohol was expected to be consumed by the guests, something that one might not always feel comfortable with, and that could be quite disruptive to the research.

6.1.4. Focus groups

For the focus group done with members of the executive committee, the reflections about relying heavily on a few informants also apply, as the informants used for this focus group were also the people generally considered very resourceful and people from the top of the longhouse hierarchy. Initially, the wish was to engage a few more of the committee members, but in the end, only three of the planned participants were available even after rescheduling more than once. In general, difficulties with making appointments is something that one should be ready to experience in any research and try to foresee and plan around as much as possible, even though this will never be completely avoidable.

6.1.5. Participatory Rural Appraisal (PRA)

As the different PRA exercises were done with quite a lot of people, it was difficult to control who got to participate more or less actively. For example, when the seasonal calendar was created, even though a whole group of people was collected and asked about the different crops, a few people, mostly men, took the lead, while several people, for the most part women, ended up as silent bystanders. In order to avoid this kind of separation a stronger facilitating role should have been performed, making sure that everyone could participate more equally.

6.1.6. Forest Resource Assessment

The idea behind doing an FRA in the area on the other side of the river was initially to compare the biomass and biodiversity between secondary forest and secondary forest with rubber, in order to see how the planting of rubber trees affected the forest resources in the area. However, on the day that the FRA was to be carried out it had rained heavily all night, and the water level in the waterways in the forest had raised to a very high level, making it impossible to go to the parts of the forest, where the FRA was meant to be done. The FRA was therefore carried out in a different area where secondary forest with rubber trees was prevalent. Moreover, the guides had, up to this point, denied the presence of primary forest. However, as it was impossible to go the planned spots, the guides seemed to suddenly remember that there was an area with primary forest up the hills. As one of the guides was the owner of the land where the FRA was initially thought to take place, it is possible that he was reluctant to tell about the primary forest, because he wanted to show his own land. This enable to do the FRA in the primary forest which gave a better insight into how the activities of the Iban had impacted the forest resources, than a comparison between secondary forest and secondary forest with rubber trees would have done.

6.2. Positioning

When conducting fieldwork being aware of one's own positioning in the field is crucial, as this has a lot of influence on the data that is collected (Bernard, 2011).

It quickly became evident that gender definitely played a role as it showed easier for the male members of the group to get into contact with male inhabitants of Nanga Ruyak and the other way around. As only two members of the research group were males it was at times difficult to obtain information from the men in the longhouse e.g. regarding offshore labour, as some men seemed reluctant to talk with the female researchers. Therefore, the perspective of the women in the longhouse might have influenced this research, more than the perspective of the men. During the research, this was to some extent considered, by carefully deciding who should carry out the different interviews etc., as it was assumed that gender relations could influence responses.

6.3. Intercultural and interdisciplinary group work

The research was carried out by four people from the University of Copenhagen and four people from UNIMAS, the two groups consisting of different ethnicities. Secondly, the groups consisted of people from different academic disciplines, both social and natural sciences. These factors caused some differences between the group members during the research e.g. different opinions on what methods to use and how to use them, different focus and fields of interests, and different approaches to ethical contemplations. In order to conduct a successful fieldwork these things had to be discussed, which could sometimes result in very long group meetings. During these meetings, students from UNIMAS were at times less active, which might have been due to cultural differences. However, as the UNIMAS students could to some extent understand Iban and had a greater insight into the cultural context, it was very important that their knowledge was shared with all groups members. In order to engage everybody equally, group meetings focussed on getting everyone to contribute by asking all group members their opinion and by making sure that the different tasks were solved by groups of mixed students from both universities.

6.4. Language and interpreters

The Iban people have their own local language. Besides a few of the group members, who had minor knowledge of the language, it was a foreign language to all and so, it was necessary to work with interpreters in order to carry out field work in this site.

When working with interpreters it is impossible to get a perfect translation every time and this adds another layer of uncertainty to the data. First of all it is important to make sure that the interpreters are properly informed about the circumstances around and thoughts behind what they are translating, in order to minimize misunderstandings. The interpreters also have to have a sense of what information is being pursued, and should therefore be involved in the process of formulating interview guides and questionnaire surveys. This was sometimes forgotten. In situations that arose more spontaneously, there often was no time for it, and this caused confusion and might have influenced both questions and responses. Even if the interpreters and the researchers understand each other fully, there will most likely be misunderstanding in the translation process between the translator and the informant, e.g. because the informant understands a question differently or because the translator has to rephrase the answer in order for the informant to understand and answer.

Another uncertainty in the translation process is the interpreter's filtration of information. It is part of the interpreters job to filter what information to translate and what to leave out. But there is a big risk that the translator leaves out something they deem irrelevant, which the researcher actually would not. Note being able to decide exactly what information is interesting or not was one of the most challenging parts of working with interpreters. Especially because often, information that seems irrelevant when at the moment might turn out to be applicable in a different connection later in the research or might open up for something else. Again, in order to avoid this, it was important to involve the interpreters in the group discussion and to make sure that the they had a clear understanding of the research in general.

7. Conclusion/perspectives

The aim of this study was to analyse how labour migration has impacted livelihoods and land use in Nanga Ruyak. The initial hypothesis was that labour migration had extensive repercussions on the household composition, on the cultivations of different crops and more generally on the villagers' way of life.

It was found, that even though labour migration *has* changed the livelihoods of Nanga Ruyak, this has been a more long-term trend than expected. Ever since the boom in labour migration in the 1980s, it has been a common livelihood strategy of young Ibans to migrate for labour while leaving their children to be cared for by their grandparents in the longhouse. When reaching retirement age, the migrants would return back to the longhouse to take on the responsibility of tending to the land and the longhouse. However, a lot of the young people staying in urban centres to work seemed unsure if they would return to the longhouse as expected. More and more frequently, the migrants stay in the urban centres, which might point towards a gradual abandonment of the longhouse, although this very difficult to predict.

Farming activities is still, at times of opportunity and good prices, a main occupation for many of the people in the longhouses. In times of low prices though, paid work offers a supplement to the income and therefore causes labour migration to increase. It was indicated that people who had migrated for work were expected to return to the longhouses when the prices of pepper went back up, something that the farmers still living in the longhouse were convinced that they would, as they were very used to big fluctuations. Besides cash cultivation, staying in the longhouse involves doing subsidence farming as another livelihood strategy, in order to avoid becoming too dependent on external factors. On top of that, the rice has a very big cultural value and is heavily connected to the Iban people's identities as farmers. These factors serve to explain why, in a globalising and modernising world, the Iban still live in traditional longhouse communities.

8. References

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9. Appendices

9.1. Schedule from the field work

FRIDAY THE 1ST	SATURDAY THE 2ND	SUNDAY THE 3 RD	MONDAY THE 4TH	TUESDAY THE STH
MORNING	PRA W. THE LOCALS	MORNING	MORNING OIL PAIN	TELP TO DEPEN PEOPLE'S
GEINING 10		10.00 TEIP TO JULAU BAZAE	TKIP TO UTL TALM	TRANSELT WALK TO PEOP
KNOW THE AREA	PREFARING PRI		JUNIT - ANNA, HEGE,?	FFA
THE WEIGHT	GOESTIONNAIDESI		X	
INTERVIEW W. INC	AFTERNOON	AFTERNOON - GROUP HEETING	AFTERNION	AFTERNOON
4PTIMELINE	PECAPING PRESENTATION	QUESTIONNAILES	PREP. PRA, 3 years	
COMMUNITY MAPPING	EARLY DINNER	STM	QUENTRANALE	S- COUNT
PREP. PRA FOR	PREPARE PRESENTATION	18 m	PARTICIPATORY HAPPING	2 country
SATURDAY MORNING			+ SERSONAL CALENDAR	
WEDNESDAY THE GTH	THURSDAY THE 7 TH	FRIDAY THE 8TH	SATURDAY THE 9TH	SUNDAY THE TOTH
MORNING	MORNING	WILLAGERS WILL BE PREPAR	5 05.00 FUNKEAL EITUAL	PINAL PREJENTA-
FRA	- STHI STRUCTURED INTER VIEW	FOR FORTHER RITUAL)	MACHINE	TION
MORNING	-	water quality - Mataupin	na.	1
		Student.		GOODBYE PARTY?
ACTORNOON NAMES	AFTERNOON	AFTERNOON START PREPARING	AFTERNOON PINAL PRES.	
		FINAL PRESENTATION		
		POrca BROUP + TIMELINE		
GROUP MEETING	+	Wet comment		
EVENING	-FOCUS a nup intenden	Eroning	EVENING	
SMARE INFRMATION				1
PARTICIPANAY MANUAL	- Participatory Mapping			

9.2. Data matrix

Method	Quantity	No. of participants
Questionnaires	24	The head of the household of each occupied bilek. (Bilek 18 did not participate).
Semi-structured interview	2	Interview with head woman, interview with young woman labour migrating to Sibu
Topic focused interview	6	6 interviews, around 12 informants.
Focus group interview	2	2 interviews, 7 informants in total

FRA - Forest Resource Assessment	2	2 different plots, 2 local guides
Participatory Observation	Throughout the research	
PRA - Participatory Rural Appra	isal	
Transect walks	3	3 walks, 2 local guides each walk.
Timeline	1	3 informants, part of focus group interview
Seasonal Calendar	1	Between 10 and 15 informants
Ranking	1	4 informants, part of focus group interview
Participatory Mapping	1	4 key informants, but more partly participating

9.3. Questionnaire Survey

QUESTIONNAIRE FOR NANGA RUYAK

General information

Date: Interviewer: Time:

Bilek:

Name:	Age:	Place of birth:	Ethnic group:	Gender:
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Marital Status:	Education Level:	Occupation:
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Household

Who are staying here?						
Name	Age	Sex	Relationship w\ head	Education	Occupation	Days/Weeks at home

Who are staying outside?

Relation to head	Working / student	Place	Do they return? How often?

Agriculture

Land owned:			Land rented	<u>!</u> :					
Crop	Area size	Irrigation system	Frequency	Yield	Price/ kg	Buyer	Middleman	Investment	Hrs of work

Cattle

Animal	Qty	Price	Use

Activities

Categories	Туре	Purpose	Frequency
Fishing			
Hunting			
NTFPs			
Orchards			
Others			

Expenses

Food	Agriculture	Medical	Education	Transport	Durable goods	Bills	TOTAL

Income

Subsidies

Institution	Title	Amount	Use

Loan

Institution	titution Purpose		Monthly repay		

Income

NAME	Agricultural	Self- Employment	Wage labour	Contributions	Property	Sell of Assets
TOTAL						

Assets

TV	Car	Refrigerator	Washing Machine	Motorbike	Boat Engine	Air Conditioning

9.4. Interview guides, semi-structured interviews

9.4.1. Woman migrating for work in Sibu

General information

- Name, age, occupation

Information about work

- Type of work (Industry/type of job)
- Place of work, working hours
- Working period
- Past work
- Reasons for migrating
- Getting a job
- Job satisfaction
- Labour migration in the past
- Labour migration in other longhouses

<u>Family</u>

- Personal status
- Job of spouse
- Children
- Living arrangements of the children and close family

The longhouse

- Returning to the longhouse
- Land in the longhouse area
- Decision-making for the household, in the longhouse

Income

- Monthly earnings
- Sending/receiving remittances
- Salary satisfaction

9.4.2 Head woman

- The role of the community head
- Internal rules and organisation
- Livelihood
- Labour migration
- Unemployment
- Land use
- Traditions, connections between land and customs
- Land ownership
- Rented paddy

9.5. Interview guides, topic oriented

9.5.1. Rice farmers

- Hill rice or flatland rice
- Rented or owned land
- Location and size of fields
- Use, own consumption, selling (prices)
- Rice variety
- Subsidies, government assistance
- Fertilizers and pesticides use and cost
- Difference of hill rice farming and flatland farming
- Working in the fields now and in the past

9.5.2. Pepper farmers

- Beginning of pepper cultivation, time, reasons
- Number of pepper plants, now and before
- Other crops, now and before
- Market and price changes, their influence on the farming
- Infections and pests
- Reasons for doing pepper farming even though it is high intensity, low income work

9.5.3. Labour migration

- Name, age, private status
- Reason for migrating
- Start of migration
- Type of work
- Job application process, getting the job
- Income now and in the past
- Work environment
- Returning to the longhouse

9.5.4. Offshore work

Name, age, private status, family, occupation Last job offshore, location, duration, type of work Past jobs offshore, locations, durations, type of work Periods in between jobs, returning to the longhouse, duration, activities Reasons for doing offshore work Contract work, job insecurity Livelihood of shore, social environment, relationships offshore, living arrangements Income Relations to the longhouse household

Feeling of 'home'

9.5.5. Elderly women of the longhouse

- Name, age, occupation, private status
- Educational level
- Childhood and youth: living in the longhouse in the past compared to now
- Hierarchy of the longhouse, class, status, power relations
- Decision-making
- Getting married
- Being unmarried
- Children and grandchildren, living arrangements, school
- Emigration from the longhouse
- Future expectations

9.6. Focus Groups

9.6.1 The executive committee of Ng Ruyak

Participants: TR Rengayan, Mr. Victor, Mr. Liang

Historical overview

- Time of establishment,
- Number of bileks in the start and now
- Evolution of the house
- Name
- Location
- Rebuilding

Land use

- Price changes
- Crop changes
- Schemes

Road access

- Establishment of the road
- Influence on the land use
- Influence on labour migration

Services

- Waste management
- Electricity
- Water supply
- Others

Income

- Income sources
- Changes in income bases

The future

- Strategies for the future
- Expectations



9.6.1.1. Timeline from the focus group interview with the executive committee

9.6.2. Pepper farmers

- Challenges to pepper farming
- Pointing out the biggest challenges
- Ranking the three main challenges

9.6.2.1. Ranking of challenges to pepper farming from the focus group interview



9.7. Seasonal Calendar

	SEA	SONA	LC	ALEN	DAR	ł				1		
	CROP	PADI PAYA	PADI BUKIT	PEPPER	RUBBER Ntorcycr (top)	COCOA	OIL PALM Once every HICE NECKI	DURIAN	RAMBUTAN DABALENGAN	PINEAPPLE	ISAN, MANANG, A MARAIS, LANOR, UCHINAR,	
2007	JANUARY						5 ton	Harvest	Harvest			
	FEBRUARY						7 ton					
	MARCH	Harvest	Haved				7 ton					
	APRIL	sell	Sell				8 for					
	MAY	Sell	Sell	Harvest			8 ton					
5-120	JUNE			Harvest			9 ton	200		and the second	-	
	JULY			Harvest			9 60				100	
	AUGUST	PESTICIDET	PESTICIONS				9 ton			-		
1	SEPTEMBER ==	Plant	Plant	Plant in oney s			10 50					
•	OKTOBER	Plant Pesmerpers	Plant Perneious				10 km				1911	
	NOVEMBER.	PETREIDET	PERICIPET				11 60	1				
Nozi	DECEMBER	FERTILLE	PERTILIZE				12 fm	Harvest	100 kg			
zoed	(recording)			-			p. Mary	1				1

9.8. Participatory map

