Poverty and Development in Rural Sabah, Malaysia

-the Case of Kampung Pauh

SLUSE Malaysia-report made by Group 2

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Preface

This paper presents the findings of research conducted in relation to a study field-trip to the Sook sub-district in Sabah, Malaysia, in October 2001. This was part of the SLUSE interdisciplinary program. Our study group during the field trip comprised four Danish students (two environmental and natural resource economists and one agronomist from the Royal Veterinary and Agricultural University of Denmark, and one geographer from the University of Copenhagen) and five Malaysians students from UNIMAS. The study was conducted in the village of Pauh, where all students stayed during the 12-day field trip.

The target groups of the paper are all people with an interest in development and environmental issues and problems in lesser-developed countries.

Acknowledgements

First of all we would like to thank DANCED for providing the great opportunity for us to be part of this very educational experience which is of crucial importance for gaining insight into the natural resource management and livelihood strategies in areas very different from our home environment. The trip has broaden our horizons and extended our abilities to work interdisciplinary and internationally.

We also would like to acknowledge our lectures within the SLUSE programme, Ole Mertz (Institute of Geography, University of Copenhagen) and Quentin Gausset (Institute of Anthropology, University of Copenhagen) for useful critical comments on this report. Special thanks also goes to our Malaysian counterparts from UNIMAS (Universiti Malaysia, Sarawak) for their patience and inspiration. Additionally, thanks to officials and other respondents of our interviews for their time, effort and the useful information they provides us with.

Also thanks to Bente Broeng (Department of Plant Nutrition, KVL) and Shazia Nasim (Institute of Soil Chemistry, KVL) for assisting us with the lab work.

Last, but not least, we wish to give our warmest thanks to the people of Kampung Pauh for their outstanding hospitality, helpfulness and kind and caring spirit.

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Abstract

The Sabah government aims to reduce poverty and initiate development by encouraging rural communities to become more involved in the market economy. This study assesses development constraints and poverty in rural Sabah using the case of Kpg Pauh.

We combined social scientific methods, especially interviews with villagers and authorities, together with land capability analysis in order to gauge the resources available to the community.

We found that poverty in terms of physical, social and human assets was severe and impeded development and integration to the market economy and outside world. Although land resources were sufficient, organisation and communication between village institutions responsible for facilitating development was poor, thereby not allowing the community to fulfil its potential. Additionally low levels of education and attitudes toward change impeded the community from breaking out of its subsistence production nature. We feel that better education may potentially ameliorate institutional infrastructure of the village, as well as modifying outlook and attitudes and the income generating capacity of the villagers.

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1. Introduction

Since its independence in the 1957, Malaysia has experienced considerable economic growth. The primary sector, especially agriculture and forestry, has contributed greatly to this development, with exports of rubber, palm oil and timber playing a leading role. Malaysia's economy is still rooted in the production and export of primary commodities, which contribute over 50 percent of export earnings, even though the secondary sector is the area of fastest growth, and now ranks ahead of agriculture in its share of GDP (Yussof *et al*., 2000). Today Malaysia is considered a middle-income country with a Newly Industrialised Economy (NIE) (Hafner, 2000). Due to the overall economic growth and government policies aimed at poverty reduction, per capita GNI has almost doubled from 1975 to 2000. Correspondingly, the number of poor declined from 49.3 percent in 1970 to 8 percent in 2000, and is targeted to reach 0.5 percent by 2005 (Yussof *et al*., 2000).

Serious income inequality still exists though, especially as the result of rural-urban, regional and ethnic disparities. In 1997, the poorest of the country's 14 states was Sabah, with 22.1 percent poverty, while Kuala Lumpur had just 0.1 percent poverty. Most of the poor live in rural areas, and accordingly poverty reduction programs have focused on rural development (JBIC, 2001).

Traditionally, the concept of poverty is approached from a physiological deprivation perspective, using income as a measure (Berma, 2000). The Poverty Line is a widely used measure of poverty and exemplifies this uni-dimensional approach: it identifies poverty with shortfalls in household purchasing power. In Malaysia the Poverty Line Income (PLI) is calculated from 'a basket of goods' consisting of the minimum requirements of a household to cover three major components; food and clothing; rent, fuel and power; and communications, health, education and recreation (Tangau & Tanakinjal, 2000). The PLI for Sabah in 2001 was calculated as RM 685 per month for a household of 4.9 people (Nair, 2001). Any household earning less is considered *poor*, and *hardcore poor* if its income falls below half that amount**.**

Although rural development has been part of Malaysia's development agenda since 1957, a comprehensive formulation and implementation of poverty eradication first came about in 1971, with the New Economic Policy (NEP). 1989, the Ministry of Rural Development started working for poverty reduction in a comprehensive way through the Development Program for the Hardcore Poor (PPRT). The program includes income generation, attitude change, and direct support for nutrition and housing (Hussain, 2000).

The new national long-term development plan 'Vision 2020', sets out the nation's goal to achieve the status of developed country by 2020. The plan covers among other things objectives for development of the primary sector, partly aimed at facilitating development in the rural areas. In Vision 2020, the current situation of the primary sector is recognized as a

transition period, which is expected to evolve into industries for domestic food production, except some major export products such as rubber and palm oil (Nair, 2001).

The Sabah state economy is largely influenced by the performance of its rural sector (MADFI, 2000). Additionally, in Sabah, poverty is especially a rural phenomenon, with the highest incidence of poverty occurring among rural paddy cultivators (Tangau & Tanakinjal, 2000). Consequently, poverty reduction efforts, in line with the Vision 2020 strategy, have emphasized the development of agriculture, which means that, among other things, the Sabah government aims to transform smallholder subsistence agriculture into a more commercial and dynamic sector by promoting, more intensive farming systems and the use of cash-crops by providing subsidies, training, seedlings, fertilizers an extension services at the village level. The main state agencies involved are the Department of Agriculture and, to a lesser extent than in earlier years, the Rural Development Corporation (KPD) (Lim & Douglas, 1998; MADFI, 2000).

Thus the goals for rural development of the Sabah government are a combination of strategies linked to the changing of behaviour of individual farmers and farming communities in relation to natural resource management and livelihood strategies. Their primary aim is to integrate these communities into the market economy and modern society. However, these strategies do not appear to have had a universal effect on farmers and farming communities. Sometimes villages very close to each other still show severe disparities in income level, and may not benefit to the same degree from the efforts of the government policies.

1.1. Broadening the view on poverty and development

The use of the PLI and its implied assumption that poverty can be approached as a uni-dimensional problem of lack of purchasing power to satisfy basic needs, has been criticised for being to reductionistic (Friedmann, 1992; Chambers, 1997). Chambers (1997) suggests a multi-dimensional approach to poverty covering the more intangible aspects of deprivation. Deprivation in this sense includes dimensions such as social inferiority, powerlessness, sickness, vulnerability, dependence, and physical and social isolation. Poverty can thus be seen as a state of deprivation of real opportunities and lack of access to assets. Following this definition, the poor are unable to take full advantage of available opportunities and lack assets that are needed to generate a development that can lead to a positive change in their livelihoods.

Berma (2000) suggests broadening the conceptualisation and measuring of poverty to include besides physical, also human and social capital or assets. Physical value refers to the monetary value of any form of financial asset, e.g. money, holdings, property. Human capital includes the set of skills that are needed to produce a good or a service. The most widely used proxy for quantifying these skills is years of formal education. Social assets refer to the set of norms and social networks that facilitate collective action among individuals and are the one

most difficult to quantify. Having access to these assets means individuals have the potential capacity to generate income and initiate development (Berma, 2000).

In other words, poverty alleviation and development are not only about obtaining physical capital, but include the obtainment of physical, human and social capital required for individuals or communities to enter a cycle of positive change, i.e. development.

1.2 Objectives and Focus

Kampung Pauh is considered one of the poorest communities in the Sook area. The mainstay of the community is subsistence farming and the village has not developed along the lines of the Malaysian rural development agenda.

This study is an attempt to ascertain the extent and seriousness of the poverty problem amongst the people in Kpg Pauh. In order to do so, we firstly will make a general assessment of the community and the prevailing livelihood strategies and natural resource management, and their impact on the natural and socio-economic environment. The study also attempts to identify the underlying causes of the problems that have resulted in the community being at a disadvantage compared to the neighbouring villages, such as Kpg Sinulihan, a model village for the Vision 2020 development scheme. The differences between those two villages highlight how the rural development goals of the Sabah government have found very different roots in communities geographically very close together.

In summary, we have posed ourselves following research questions:

- *What is the extent and seriousness of the poverty problem in Kpg Pauh, and what access do the villagers have to physical, human and social assets?*
- *What are the main constraints to development in Kpg Pauh, and how do these constraints interact?*

1.3 The Study Area

The Sook Plain is located in Sook sub-district east of Keningau in the Interior District of Sabah, Malaysia. The population in the Sook catchment area is a mix of Murut people, indigenous to the area and newly settled people coming from all over Sabah, especially from the Dusun community (both Christian and Muslim). The Muruts were until recently hunter-gatherers, and are in reality a heterogeneous group of tribes, each showing variations in customs, culture and language.

The major crops grown in the Sook area include oil palm, rubber, hill rice, cocoa, wet rice, fruit trees and yam (SLUSE-M, 2001). The predominant soil type of the region is Ultisol (Brookfield *et al.*, 1995).

Kampung Pauh was established more than 60 years ago, and, at the time of this study, comprised 207 people in 30 households. All villagers were ethnic Muruts belonging to the Paluan group. The community was Roman Catholic, with the exception of two community

members, who professed traditional Pagan beliefs. The houses of the village are clustered between the gravel access road from Sook, the nearest town, to the north and the Sook River to the south. Villagers from Pauh share a lot of resources with the nearby Murut villages of Tulid and Kindasan, such as a common area for their wet paddy fields, common community centre and parish church (located between Pauh and Tulid). The area has one health clinic, a primary and secondary school, and a police station.

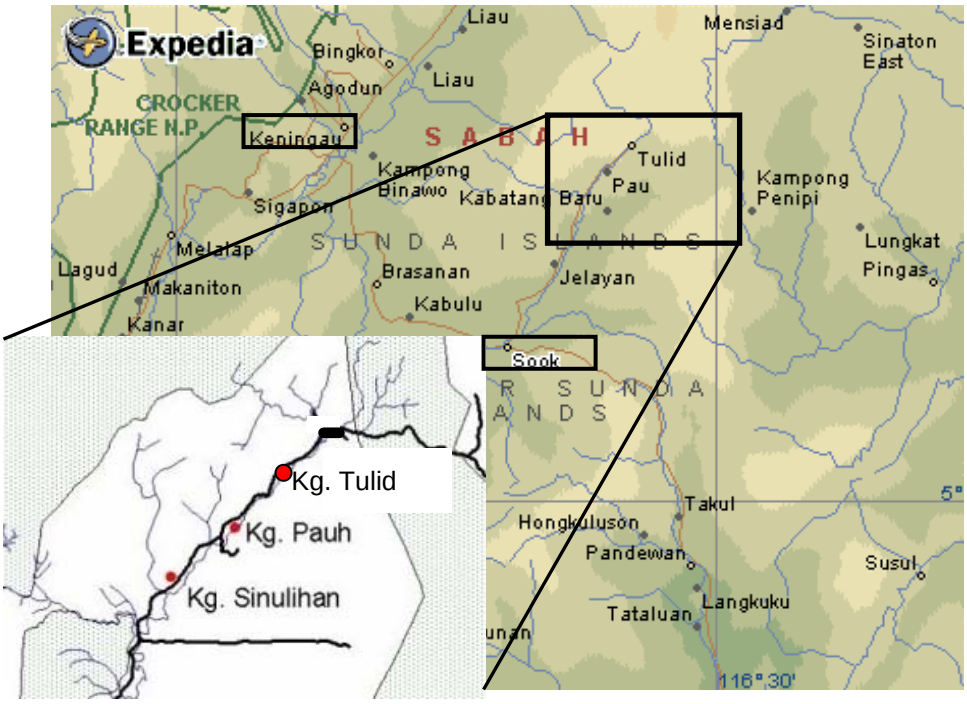

Fig. 1.1 Map of the study area showing Kpg (Kg.) Pauh (spelt Pau in the larger scale map), Kpg Sinulihan, Kpg Tulid, Sook and Keningau.

1.4 Structure of the Paper

The following chapter describes and assesses the methods and the experience we gained from using the methods. In the subsequent chapter we present, analyse and discuss our findings of the Pauh community, its functioning, its relationship to the outside world, and the impact of livelihood strategies and natural resource management on the environment. The different findings, their interactions and their relevance in respect to poverty and development are summarised at the end of the chapter. In the final chapter we make conclusions about the level of poverty and physical, human and social assets that the people of Pauh possess, which could potentially enable them to change their situation. We end the paper with brief thoughts on what is necessary in order for the Pauh community to initiate positive change.

2. Methodology

SLUSE being an interdisciplinary study program meant that one of the major challenges was to collaborate among different scientific disciplines. The nature of our task therefore demanded that we combined social scientific and natural scientific research methods, quantitative as well as qualitative. We feel that both methodological approaches have greatly complemented each other and allowed us to investigate our working questions from different angles. As Smith (1986) puts forward, the most reliable assessment or diagnosis of a situation is obtained when information from as many sources and approaches as possible is pooled.

Another aspect of the SLUSE study program is the cooperation across nationalities. Before actually going to meet our fellow Malaysian students in Sabah, we had to coordinate the objectives of our common synopsis, which gave us an experience in advantages and shortcomings of the Internet. Once gathered in our cross-discipline, cross-cultural group, we experienced that we also had very different traditions for, and approaches to the actual working process, even if our academic backgrounds were similar. This was a source of frustrations, but also taught us tolerance and compromise. We therefore felt it was a positive experience to work as an integrated group with our Malaysian co-students, and to learn from all the challenges embedded in the SLUSE concept.

On-location study

It was in many ways a great advantage for us to stay in the village, during our research. First of all it gave us a level of insight to the village situation that we could not have attained otherwise. Furthermore it made it easier to evaluate and cross-check information we obtained. Especially during the first days we experienced that what we heard did not always match what we saw. This could be due to the fact that informants did not place the same value or weight on things as we did, and that we therefore misunderstood answers. For example, villagers were often unable to quantify the amount of forest products they collected, as did not perceive as it as having a value probably due to the fact that is was not a scarce resource. By being able to constantly evaluate we became aware of the need to reconsider the phrasing of some questions, or adapt our perception of answers.

Some strong time and resource constraints were forced upon our choice of methods by the fact that our stay in Sook only lasted 12 days. Nevertheless, we intended to try out a host of different methods in order to learn as much as possible from and about them. The initial methodological framework was modified during our fieldwork in Sook into a selection of methods, which compromised:

Interviews

- Household survey (questionnaires – 100% census)
- Semi-structured interviews
- Informal conversation

Participatory methods

- Participatory observation
- Participatory mapping

Natural scientific methods

- Field and soil sampling and analysis
- Crop sampling and analysis
- Water sampling and analysis

Interpretation: The use of all these methods was compounded by the fact that we could not converse directly with local people. Additionally, we never had full-time access to an interpreter who was both fluent in the local Murut language and English, and hence had to make do by using both some local villagers as *ad hoc* interpreters and our Malaysian student counterparts as translators (fortunately most villagers could speak Malay).

Our local interpreters included the native chief (a local judge) of the area and two young village women. Working with the local women, although their level of English was hardly sufficient, had the advantage that they were familiar with the community and people were familiar with them, which created a secure atmosphere during interviews. Working with the local native chief had the same advantage and he spoke better English, but he was often busy elsewhere. Rarely using the same interpreters for more than a couple of interviews meant that they did not have a chance to get used to us or our questions, and *vice versa*, thereby making translation inefficiency and inaccuracy more pronounced. Using and relying on our Malaysian co-students as translators had both advantages and disadvantages. It was disadvantageous because it bound our Malaysian counterparts to us when either they or we could have been more effective performing other tasks. However, it had a major advantage in the fact that our Malaysian co-students, drawing on similar academic understanding and desiring the same information, were very capable at asking the right questions, leading the conversation and dissecting relevant information for translation. Thus the loss of information that may have occurred by relying on an interpreter less aware of our goals and methods was minimised.

2.1 Interviews

Interviews are one of the most important sources of direct and targeted information, but can include a number of biases, originating from poorly constructed questions and interviewing techniques, poor recall and/or willingness of the respondent to give an answer that pleases the interviewer rather than the factual truth (Yin, 1994). Keeping these biases in mind, we constructed preliminary questionnaires and interview guides that were adjusted and refined after initial test interviews. We usually made appointments with the respondents one or two days ahead of the interview. At the interview itself, we introduced ourselves and provided a short introduction regarding the project and the purpose of the study, insuring the respondents confidentiality, before starting with simple questions that required neither further interpretation nor lengthy recall on the part of the respondent. This technique is recommended

by Casley & Kumar (1988). After each interview, we asked the respondents if they had anything of their own to add in case there were issues we had overlooked.

2.1.1 Household survey - questionnaires

We applied questionnaires to all 30 households in Kpg Pauh in order to obtain basic, quantifiable data on the village as a whole. Our definition of a household included the people that actually lived in the house and excluded family members that either temporarily or permanently where residing elsewhere, even though these might contribute to the household income. This definition corresponds to one formulated in Friedmann (1992), where household members are the ones that share the same 'pot', i.e. cooking facilities. The questions concerned mainly demographics, educational level, sources and level of income, migration, land use, size of landholding, crops used and yields, inputs, source of credit. To assess the respondents' perception on environmental protection, government support, village infrastructure, etc., the questionnaire included a list of statements to which the respondent could reply whether she/he agreed. Even when our Malaysian co-students conducted a questionnaire session by themselves, without having to translate for us, it often took more than an hour to complete. This was applicable since we only had to cover 30 households. Furthermore, we realised that it actually helped break the formality of the questioning, as it meant that there would be a tea break in the middle, where informal but informative conversation with the respondents took place. Sometimes villagers gave reluctant or conflicting answers concerning their income, and they often had difficulties quantifying amounts of inputs or produce and comprehending the perception questions properly.

2.1.2 Semi-structured interviews

We performed semi-structured interviews to explore *hows* and *whys* in more depth, often on questions already posed in the questionnaires. In this sense the two methods supplemented each other very well. The qualitative interviews have allowed us to explore *a dynamic and negotiated reality* in more depth, thus providing us with more background, as well as insight to people's own views (Furze *et al*., 1996). The interviews mostly had the form of topic-focused interviews with key informants. These included the native chief, the headman, the JKKK chairman and the church secretary, and local and regional civil servants (two local headmasters and two teachers, the local priest, the local health clinic, and the headman of a neighbouring Murut village). We randomly selected five farming households to interview in more depth on a broad range of issues, especially farming practices, from the fifteen households that had hill rice plots and were available at the time. Within these five households, we chose two females and three males to interview, in order to have roughly equal gender proportions represented. The soil and crop sampling was conducted on fields belonging to these five households in order to later corroborate detailed field history with the soil and crop data.

We participated in interviews with representatives of the District Office in Sook, the Department of Agriculture, both in Sook and in Keningau, the Forestry Department, the Land

and Survey Department, the KPD, and visited the Institute for Development Studies in Kota Kinabalu in order to get background information on important issues.

2.1.4 Informal conversation

As a method informal conversation can be seen as a mean both in relation to interviews and also in relation to the more participatory methods, aimed at obtaining information and gauging the atmosphere and relations between villagers putting our daily observations into the right light

2.2 Participatory methods

We used participatory methods in order to involve and engage community members in our methodology and to initiate dialogue as described by Mikkelsen (1995). We found that this approach complemented and supported the other methods in a constructive manner.

2.2.1 Participatory observation and socialisation

Spending leisure time with villagers allowed us to establish personal relationships, which facilitated informal conversation, permitting us to gauge 'the atmosphere' and witness the everyday life in the village. We set up a Karaoke system in our house, which proved extremely popular with the villagers. This created a gathering place where we had easy access to interaction with the villagers, and which made both us and them feel comfortable. We also played volleyball with the village children in our spare time. Two members of our group helped a farmer transplant wet paddy rice, thereby gaining an opportunity to *learn by doing*, while at the same time creating goodwill and facilitating informal interaction and conversation with the involved farmer. Additionally, we went on walks and field visits around the village land and to the water supply dam, etc., with informants during the first couple of days. This helped us gain visual knowledge about Pauh and certain important issues. Furthermore, these walks allowed our informants to break out of the formal interview setting and talk more openly.

2.2.2 Participatory mapping

The participatory mapping gave us an idea of the dimensions of the community straight away. We initially asked one woman to draw a map of the village, but soon more people joined and commented or added and adjusted bits and pieces. Additionally, after finding out that most of the villagers were related to each other and originated from about 10 families, we asked them to draw up a chart of relationships. Apart from granting us a physical overview of the village, we also learnt about various households and their activities through the prevailing discussion about who lived where and where their fields lay, etc. It also gave us an insight to how well the villagers actually knew about each other.

2.3 Natural scientific methods

We conducted field, soil, crop and water sampling and analysis in order to answer three major questions:

1. The suitability of the agricultural land around Pauh for growing the cash crops that are recommended by the Department of Agriculture,
2. Basic land productivity/potential in both Pauh and Sinulihan using some basic field, soil and crop analysis,
3. The impact of agricultural practices on the land productivity / degradation in terms of plant nutrients, water quality and some visible symptoms such as erosion, etc.

2.3.1 Field and soil sampling and analysis

Field and soil analysis was performed on one hill rice plot of each of the five farming households with which we conducted semi-structured interviews and on one additional field. The analysis of the fields involved drawing rough sketches of the fields and their surroundings, including their topography, as well as noting if any intercropping existed. The sizes of the fields were measured using GPS and a clinometre. On each field we marked five equally spaced 1×1 m subplots along a diagonal transect. Each subplot was then sketched in respect to weediness and plant density. We extracted soil samples from the middle of each subplot down to rooting/plough depth (ca. 40 cm) using an auger, first to about 20 cm and then again to about 40 cm. We analysed the dried soils in Kota Kinabalu four days later using a soil laboratory kit, after carefully sieving the soils and thoroughly mixing them with soils of the same depth and field (i.e. each topsoil was mixed together with other topsoils of the same field). This gave us ten soil samples, two from each farm/field, which we subsequently analysed with three replications of each. Analysis included pH & electric conductivity (EC); soil texture; and nutrient analysis for NH_4, NO_3, P and K.

The relatively small sample size may not have been sufficient to give a representative picture of the field fertility; especially as tropical soils are usually extremely variable (Ahn, 1993).

2.3.2 Crop sampling and analysis

We sampled the youngest fully emerged blade (suggested by Reuter *et al*. (1986) in order to insure tissue of similar maturity) of five rice plants on each field-subplot. After sun-drying the samples, all the blades from one field were then packed into plastic bags and taken to Denmark. We also bought rice grains from last years harvest from all the farmers whose fields we investigated. Analysis of the rice blades and grains for N (Kieldahl), P (colourimetrically using an autoanalyser system), K and Ca (atomic absorption spectrometer) was conducted at the Department of Plant Nutrition, the Royal Veterinary and Agricultural University of Denmark.

2.3.3 Water sampling and analysis

We carried out water sampling in order to test the hypothesis that fertilisers, pesticides and other potentially polluting agents employed by Pauh farmers may have a negative impact on waterways and drinking sources. We took water samples and GPS measurements from the middle of the water supply dam, and from the middle of the Sook River immediately before and after Kpg Pauh. Samples were analysed *in situ* for temperature, conductivity, total dissolved solids, salinity, dissolved oxygen, pH, Cl, NO_3, NH_3, NH_4 and turbidity using a hydrolab metre. Subsequently biological oxygen demand, chemical oxygen demand and PO_4 were analysed using a *pacqua lab* field kit.

4. Results and Discussion

In the following chapter we will present, analyse and discuss our results. In order to make an assessment of the community, the findings are first discussed in discreet sections covering aspects of livelihood strategies; sources and level of income; and natural resource management with its impact on the immediate environment. Secondly, we recapitulate the major constraints the community faces and how some of these constraints are linked in a summary discussion.

3.1 The village infrastructure

The village consisted of 35 houses, most of which were constructed of wood through government funding as part of the PPRT scheme. Five houses were empty because their occupants had emigrated for wok. Fifty seven percent of the inhabited houses had piped water, while only 40 percent had access to electricity. With one exception, all houses had access to a permanent toilet. The villagers generally perceived village infrastructure as poor to adequate, and most villagers stated that access to piped water and electricity were their major needs.

3.2 Level and sources of income

The average monthly household income in Pauh was RM 655, which was considerably lower than the overall Malaysian average of a monthly rural income of RM 1669 (Tangau & Tanakinjal). Although the Sabah Poverty Line Income for a household of 4.9 is RM 685, as the average household size in Pauh is 6.9 rather than 4.9, we have calculated the actual amount to be RM 854. The households that fall under the poverty line is thus 86.7 percent, and almost half of all households can be considered hardcore poor (Table 3.1). The hardcore poor automatically qualify for assistance from the Welfare Department. In spite of this only five households mentioned that they received assistance. The Welfare Department acts upon recommendations by the JKKK or the village headman. The fact that there houses where built through the PPRT scheme which aims at helping hardcore poor, must mean that the officials at some point in time have been aware of the situation, but no further actions have been taken in terms of poverty alleviation in Pauh.

Table 3.1 Monthly cash income (including remittances) of the 30 Kpg Pauh households. Income categories are based on the Sabah PLI of RM 854 for a household of 6.9. Incomes below RM 854 are considered *poor*, while household incomes below RM 427 are considered *hardcore* poor.

Monthly cash income in RM	Frequency	Percent
< 427	15	50.0
428 - 850	11	36.7
851 - 2 792	4	13.3
Total	*30*	*100*

There may of course have been inaccuracies in our data, due to reluctance on behalf of villagers to talk about income, or because they simply were not sure how much they earned. Our observations however did support the notion that poverty was severe. When asked about household expenses, for example, one villager mentioned pencils for his children at school as the first thing. This may be mean that the family finds it difficult to make ends meet, since pencils should not represent a considerable expense.

Most money in Pauh was earned through employment outside the agricultural sector, e.g. as civil servants or in private industry, amounting to nearly 80 percent of all cash income (Fig. 3.1), but was restricted to only 21 percent of the population (Table 3.2). Twenty four percent of people from Pauh had emigrated in search of labour or due to marriage, but many sent monthly or annual remittances home to the remaining family members. These remittances were the second largest input of money to the Pauh community. Only 9 percent of total cash income was derived from farming, forestry, hunting and fishing. However, these figures underestimate the importance of the income derived from farming and the natural environment, as they neglect the subsistence or in-kind contribution of these activities. The in-kind income is calculated by looking at the household's consumption of its own produce (in market prices). If this is taken into consideration, the agricultural and natural resource sector becomes the most important, representing nearly 50 percent of total cash and in-kind income (Fig. 3.2).

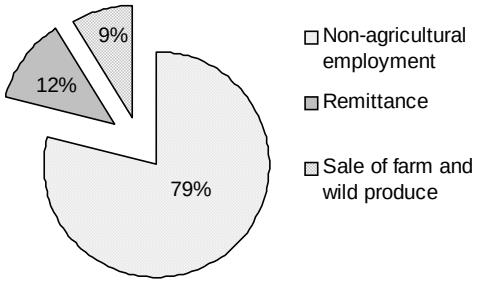

Fig. 3.1 Proportion of cash incomes derived from natural resources, from employment outside the agricultural sector and from remittances sent by family members residing outside Pauh.

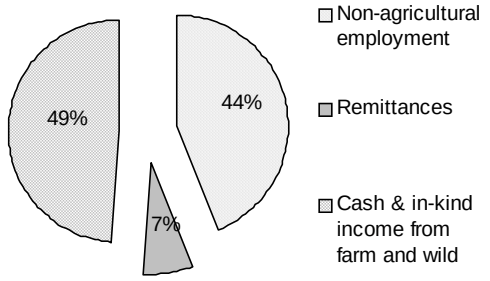

Fig. 3.2 Proportion of cash and in-kind incomes derived from natural resources, from employment outside the agricultural sector and from remittances sent by family members residing outside Pauh.

The significance of the agricultural and natural resource sector is further highlighted by the amount of people engaged within it. Almost 80 percent of villagers in Pauh work on, or own farms, while about 8 percent are employed as civil servants and the remaining 13 percent work in the private sector (Table 3.2).

Table 3.2 Major occupation of the workforce (87) of Kampung Pauh. The remainder of the 207 surveyed inhabitants was either in school age (114), above working age or in poor health (6) (see also Fig. 3.1). Many of the villagers not listed as farmers practiced farming as a secondary occupation.

Main job	Frequency	Percent
Farming	69	79
Civil servant	7	8
Private non-agricultural employment	11	13
Total	*87*	*100*

3.3 Agriculture and natural resource management

Rice was the principal enterprise of farmers, even though, measured in cash (yield × market price), rice only accounted for about 20 percent of total agricultural production (Fig. 3.3). Measured in cash, livestock production was actually the most important agricultural activity, but this is due to the high cash value of cattle rather than its relevant importance to Pauh farmers as a whole, as only few farmers owned cattle. Farmers also produced fruits (rambuttan, mangoes, durian, coconuts, etc.), vegetables (spinach, cassava, sweet potatoes, etc.), rubber, maize and tobacco (Fig. 3.3). Most agricultural production was for household consumption and only 6 percent was sold on the market (Fig. 3.4). Hunting, fishing and collecting forest products, such as wild vegetables, fuelwood and fruits were important activities and used both for own consumption (85%) and for sale. Hill rice was grown on roughly 74 percent of the Pauh agricultural land in a rotational system (shifting cultivation) based on a single rice cropping cycle succeeded by intercropped cassava, pineapple, coconut and banana, etc. Some farmers grew rice for more than one season on a particular plot if yields remained high, but this was an exception rather than the norm. After rice cultivation, the intercropped plots were rarely maintained and evolved into secondary forest after some years. The majority of the farmers we interviewed left the secondary forest fallow for more than 20 years before cultivating rice anew on it, but one farmer did say that he only fallowed his land for 5-6 years. These long fallow periods were possible as sufficient land was available, and 86 percent of farmers stated that they had sufficient land to cover all their needs.

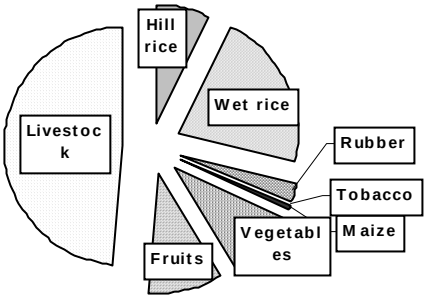

Fig. 3.3 Yield (in cash value) of individual agricultural products as proportion of the entire agricultural production of Kpg Pauh.

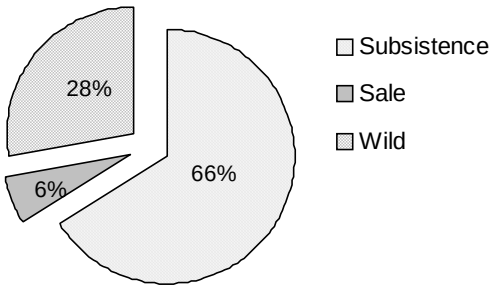

Fig. 3.4 Importance (in cash value) of subsistence and cash agricultural products, as well as collec-tion of products from the wild (e.g. firewood, fruits, animals, vegetables, fish). Data for entire village.

3.3.1 Land capability and agricultural soils

The soils were generally moderately deep sandy loams with weak profilation, a pH range of 5-6.5, low salinity levels and a thin (< 5 cm) surface layer of organic matter. In terms of the nutrients analysed, NH_4 was sufficiently plant-available in the topsoil, but poorly available in the subsoil; NO_3 was poorly available in both top and subsoil; P was moderately to poorly available in both top and subsoil; and K was sufficiently available in both top and subsoil (Fig. 3.5). The soils of Pauh fields did not differ significantly from hill rice field soils in Sinulihan. As NO_3 is the most readily available source of N to plants, its low levels in the soil could potentially restrict crop production.

However, as NH_4 is fairly abundant in the topsoil, and as it is a potential source of NO_3 after mineralisation, the low NO_3 levels may not be a problem. Additionally, NO_3 is very mobile in the soil and is easily leached after rain (Marschner, 1995). We took our soil samples after a rainfall event, which means that NO_3 may have been leached to deeper soil strata, but at the same time maximum mineralisation rates would be initiated to produce new NO_3 stocks (Gregory *et al*., 1998).

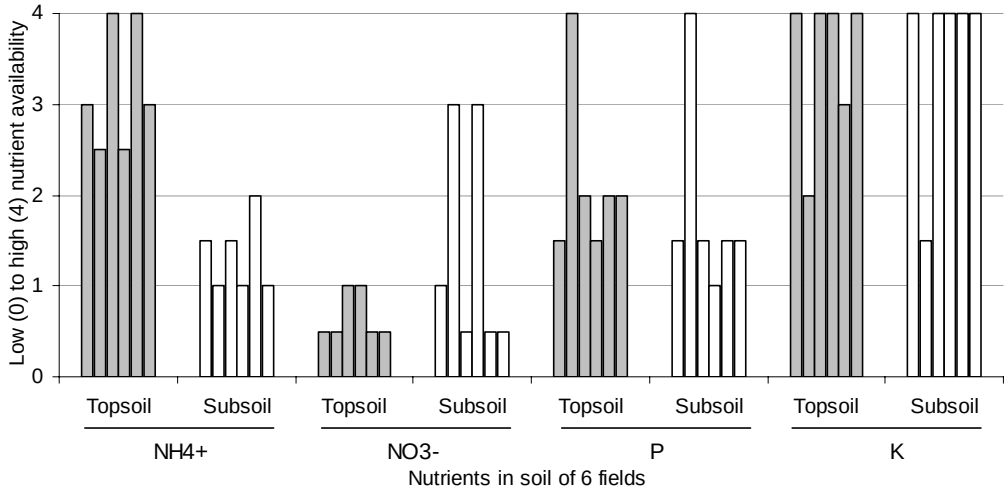

Fig. 3.5 Availability of NH_4, NO_3, P and K in the topsoil (0 – 20 cm depth) and subsoil (20 - 40 cm depth) of six hill rice fields belonging to six Pauh farmers (0 = unavailable; 1 = low availability; 2 = medium availability; 3 = medium to high availability; 4 = high availability). Nutrient availability was determined using a field soil laboratory kit. Columns represent fields and values are based on 3 replications (analysis) of five samples from each field. As values are not quantitative (numbers are only assigned to categories in the figure for technical reasons), standard errors are not presented.

However, to be certain, it would be necessary to consider different soil parameters in combination, such as organic C at different soil depths and the C:N ratio of soil organic matter. Phosphorus sufficiency is also difficult to assess, as rice cultivars can differ greatly in their ability to mobilise soil P and in their P efficiency (Otani & Ae, 1996). Assessing these additional indicators would definitely have granted us a broader and more holistic picture of soil fertility, but due to our time and resource constraints, their analysis was beyond the scope

of this study. However, we did work out the average yield of rice to be 1664 kg of rice per hectare during last years season, which is about average compared to results presented by Cramb (1989) for a similar environment, where soil fertility was not a production constraint.

3.3.2 Agricultural inputs

Since 1990, farmers have been given free fertiliser for their wet paddy from the Department of Agriculture in Sook. Farmers were also supplied with pesticides at subsidised rates, especially against snails in the wet paddy (after an agricultural officer has surveyed the infested area), and with herbicides for both the hill and wet paddy areas. They, however, had to get the fertilisers and pesticides themselves from the Department of Agriculture in Sook, and some stated that it was impossible for them to do this, due either to time constraints or transport costs. Furthermore, fertilisers, pesticides and herbicides were only supplied for titled land. Only two thirds of agricultural land was titled, although this included most of wet rice land. Many farmers were still waiting to be granted title to all the land they were using, as this was a long process, involving the village headman and the village development committee (JKKK), as well as the Land and Survey Department in Keningau. Consequently, although most farmers benefited from fertilisers for wet paddy, few received subsidised inputs for their remaining land and no farmers used fertilisers on hill rice fields.

3.3.3 Impact of agriculture on the environment

In terms of the effect of pesticides and herbicides on the natural environment, some farmers stated that the pesticides used against snails did affect the fishes in the wet paddy. In the 1970's they used to catch about 50-60 kg of fishes when they drained the wet paddy, while nowadays they catch considerably less. The water quality of the Sook River at the time of sampling was equivalent to Class II of the Interim National Water Quality Standards (INWQS) for Malaysia. This indicated that the river water is still good for recreational purposes, water supply with conventional treatment (i.e. boiling) and fishery activity involving sensitive species. The wet paddy system drained into the Sook River upstream from the village. The water quality of the river above the wet rice paddies did not differ to the water quality immediately downstream, thus the effects of pesticide use were locally limited to the rice paddies and there was no significant loss of nutrients from the wet paddy system. However, the water quality could have been quite different if sampling had been performed immediately after a heavy rainfall event, in which case it may deteriorate due to leaching of nutrients from the farmland. Interestingly, most villagers stated that they would not drink straight from the river as they used to ten years ago, and blamed this perceived deterioration on the upstream oil palm and logging operations.

As farmers did not apply fertiliser to their hill rice fields, on average 19.2 kg of N, 4.6 kg of P, 116 kg of K and 0.2 kg of Ca were exported per hectare of fields through harvests (average harvest of 1664 kg of rice per hectare; most hill rice fields were less than half a hectare) without immediate replenishment. Additionally, nitrogen and sulphur are volatised during the burning of the vegetation and the bared soil is prone to erosion, thus also exacerbating

nutrient losses (Mertz, 2001). Chin (1985, cited in Brookfield *et al.*, 1995), however, argues that a system in which almost 90 percent of plots are fallowed for 15 or more years, and only 10 percent are used for more than a single year, is ecologically sustainable. This is also corroborated in findings by Kleinman *et al.* (1996) who found that slash-and-burn activities in West Kalimatan with a cropping-to-fallow ratio of approximately 1:17 did not lead to soil degradation (as Pauh farmers mostly left fields fallow for 20 years or more after a single season of cropping, cropping-to-fallow ratios in Pauh would be close to or above 1:17). The six farmers' fields that we studied in detail did not display visible symptoms of nutrient deficiencies in any of the rice plants. Leaf tissue analysis for N, P, K and Ca confirmed that there were no nutrient deficiencies according to the nutrient values presented in Reuter (1986), which also supports the fact that the shifting cultivation was sustainable in respect to plant nutrients.

3.3.4 Cash crops

Various government schemes have encouraged cocoyam or taro (*Colocasia esculenta*) to be grown commercially, suggesting that commercial production of this crop could facilitates farmers' integration into the market economy and Malaysian development network. Awards are given to the village in the Sook sub-district that can produce most cocoyam, and Sinulihan had recently won this award. Cocoyam was part of Sinulihan's success, stated by an informant from the district. Our soil analysis in fields of six Pauh farmers showed that soil pH, texture and nutrient availability would be appropriate to grow cocoyam, but in order to obtain commercial yields, the input of fertilisers and pesticides is probably necessary (based on species' climatic and soil requirements mentioned in Ahn, 1993 and Norman *et al*., 1995). Cassava (*Manihot esculenta*) was also mentioned as a potential cash-crop for the area and was already grown by many farmers on a subsistence basis. However, many farmers were risk adverse and preferred staying with traditional crops rather than changing to commercial scale production. Some farmers mentioned that they were not interested in the governmental cocoyam scheme because they were used to grow rice. The natural fear of changes, especially amongst elderly people of Pauh, thus hindered transition to cash-cropping.

Additionally, innovations such as new crops or new production methods are frequently costly, unavailable and unreliable, and require a major departure from well-tested methods, which are often carefully adapted to the environment. Therefore it is understandable that farmers with low-level technology and limited financial resources cannot afford the required investment and are not prepared to take such risks (Potter *et al*., 1999). Someone from the village bought a tractor for farming in 1983, but only used it for two months before it broke down. The price of the tractor was RM 30 000 and the unfortunate purchaser was still paying for it now in monthly instalments. 'This is why we don't want to buy a tractor, as we can't afford repairs' said an informant. Obtaining cash and credit was a problem since subsistence farmers have low creditability as they have little to put up as a surety (Potter *et al*., 1999). Furthermore, without sufficient advice on how to establish new crops, there could be negative consequences. Cassava, for example, is not effective at controlling erosion and leaching, and

often depletes soil nutrients, especially potassium (Ahn, 1993). Growing cassava on a commercial scale could therefore potentially lead to erosion problems and soil degradation if not conducted properly, especially on the sometimes steep agricultural land of Pauh.

In summary, we have seen that natural resource management at present in Pauh was sustainable, but with a transformation of crops and production methods (e.g. continuous cropping), this may not remain so. Imam Ali (pers. comm., cited in Brookfield & Byron, 1993), for example, reported that despite increasing application rates of inorganic fertilisers and pesticides to boost yields, farmers faced declining productivity in the Kundasang area of Sabah. These farmers entered a downward spiral of decreasing yields and increasing dependency on fertilisers and pesticides to improve yields. As we have seen, the use of pesticides in Pauh has already led to decreases in the fish abundance in the wet paddies. Ultimately, therefore, the Pauh farmers may be putting the land, in which they have a long-term interest, at risk.

3.3.5 Agricultural extension

The Agricultural Department and the Forestry Department stated that they send out advisers to the different villages in the Sook sub-district twice a month. However, we were informed by the Department of Agriculture in Sook that advisers did not visit Kpg Pauh because the Pauh community hall, where meetings should take place, was in poor condition. The villagers of Kpg Pauh were therefore forced to attend these advice sessions in nearby villages, which they rarely did. Some farmers complained that, although they were willing to establish homegardens with commercial fruit trees on fallow hill rice land, they did not know how to go about it and lacked advise and support from the Department of Agriculture. Apparently they had expressed their interest to the village development committee (JKKK) and to the women's organisation (Kerasulan Wanita Katholik), who then in turn should have organised a meeting with officials and experts from the Department of Agriculture. Extension agents however never came to discuss homegarden establishment. Several villagers' also explained that they had rubber trees, but did not know how to tap the rubber. Finally, other cash-crop schemes, such as cocoyam and cassava, also hinge on assistance and advise from extension agents, which, in the case of Pauh, was insufficient.

3.4 Human resources

3.4.1 Labour

In low-productivity agricultural systems the most important input is human labour. Many farmers in Pauh stated that they lacked the human labour necessary in order to increase their productivity. Fifty one percent of the population of Pauh was younger than sixteen (Fig. 3.6), which means that they are often unproductive dependants, being either too young to work or in school during peak labour periods. Thirty seven percent of the population were in the most productive age group of 16 to 45 years old, while 9 percent were in the slightly less

productive age group of 46 to 60 year olds. Three percent of the population is over 60 years old.

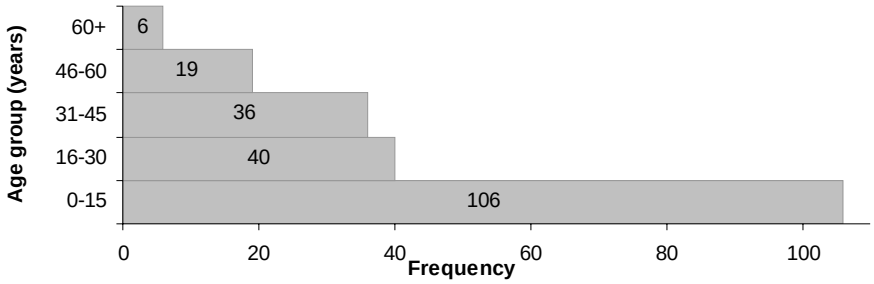

Fig. 3.6 Age distribution of residents of Kampung Pauh. The total number of residents surveyed was 207.

The suggestion that children below 16 are unproductive was confirmed by several villagers who told us that children rarely helped their parents in the field, but did help look after their younger siblings; a fact that was further supported by our observations. Consequently, the large amount of children represented an economic challenge to households in terms of additional expenses, without contributing to income. The children are however an important future resource. The younger generation (< 30) is more conscious of what's going on in the world outside Pauh and therefore may prefer other ways of making a living than traditional farming, being less risk adverse and more innovative. Additionally, as this generation has a high labour opportunity cost doing farm work compared to of off-farm and extra-village employment (Cramb, 1989), many may choose to earn a living outside the agricultural sector or in another area. Some informants perceive it as a potential future problem that many youths will choose to migrate to other areas because of the lack of opportunities in Kpg Pauh.

3.4.2 Education

An important prerequisite to improve the long-term income earning capacity are the credentials and skills acquired through educational. The cognitive skills, social skills and credentials that can be gained at school expand the choices available for people (Berma, 2000). The few villagers who had obtained additional training after finishing obligatory school were also the ones with the better paying jobs, such as the medical assistant on the local health clinic, who had been trained for six months to be able to get the job. Generally most children in the village finished primary school, but only a few continued to upper secondary level. While 35 percent of villagers started secondary school, only 2 percent actually attended or had completed upper secondary school (Table 3.3).

Table 3.3 The level of formal education among residents of Kpg Pauh

Educational level	Frequency	Percent
No schooling	11	5
Below schooling age or attending primary school	119	57
Attending or completed lower secondary school	73	35
Attending or completed upper secondary school	4	2
Total	*207*	*100*

This fact was highlighted by headmasters and teachers of regional schools, who pointed out that pupils originating from Kpg Pauh generally failed to obtain 'good marks' and frequently dropped out of secondary school. One headmaster stated that last year, dropout rates from his secondary school amounted to 40 percent among Pauh pupils. Students from Sinulihan, on the other hand were much more disciplined and higher achievers. Additionally, in Sinulihan there was a night school for people willing to further educate themselves but lacking the time during the day, something that was entirely absent in Pauh. Many informants both inside and outside the village pointed at education as the way forward for Pauh, all though others stated that many people in Pauh did not perceive the importance of education. The reasons for educational shortcomings in Pauh compared to Sinulihan were perceived as lack of 'internal' motivation, due to the fact that neither children nor parents were fully aware of the value of education. Even if they did consider it important, they felt unable to obtain it, according to an informant. The children lacked encouragement from their parents and were sometimes, according to a local priest, even discouraged, since for the girls' part, 'they are just going to get married'. Furthermore, an 'external' disincentive existed in the sense that the costs accruing from schooling were sometimes a barrier for poorer families. Although the income level of most Pauh households would entitle them to receive free schooling, subsidies for school books and uniforms and a 'milk' allowance to cover each child's school lunch costs, many parents failed to claim them these allowances and subsidies from the relevant government departments. This was due to time or money constraints involved in getting to the agencies, or because they were intimidated of asking the authorities due to the Murut 'culture of not asking' for things, according to an informant. Two villagers who were actually qualified to go to university, and although they had desired to do so, were restricted because the family could not afford the cost of RM 1000 per university year.

Additionally, at least two children dropped out of school last year due to tuberculosis and felt that it was not worth going back to school this year, as they were unwilling to try and catch up lost time.

3.4.3 Health

Poor health is often a major constraint to labour productivity and can, as seen in Pauh, be a constraint to education for the children. It is often used as an indicator of development, and it might be argued that a healthy population is more able to contribute to development efforts and will also be better placed to benefit from the fruits of such efforts (Potter, 1999). The

most serious disease in Pauh was tuberculosis, having affected nearly 10 percent of the population within the past 5 years. The rate of stillbirths in Pauh was very high with 4 occurring in the past 5 years. Considering that there were only 20 children under six years old, and assuming that families with young children had not moved away from Pauh within the last five years, this would amount to nearly 17 percent of births being stillborn. An employee at the local health clinic put this down to Pauh people being very traditional and not seeking medical help at the clinic. Another health clinic employee further stated that in Pauh there was a lack of co-operation between villagers, and this manifested itself in the lack of communal handling of the surrounding cleanliness, thus decreasing hygiene and increasing the incidence of disease. The way forward, he believed, was to create awareness of hygiene and health issues through education.

3.5 Village organisations and institutions

Although there were officially five existing communal organisations in Pauh [JKKK (Village Development and Security Committee), Kerasulan Wanita Katholik (women's church organisation), UMNO and PBRS (political parties), and Persatuan Murut (an organisation devoted to unifying Muruts throughout Sabah)], only one actually performed any functions. This was the JKKK, responsible for facilitating development and progress in the village and whose primary objective is to act as a 'bridge between the village and the government'. The JKKK is part of a political structure implemented in 1984, and is linked to the ruling party in the government, who appoints both chairman and five members of the committee. 'The criterion that has to be met to be appointed are that the persons under consideration are members of the ruling party, and the villagers have no say in their appointment', said the chairman. The JKKK term is 2 years, and the existing committee's actually expired, but the chairmen expected that they would be reappointed.

The most important function of the JKKK is to identify the greatest needs of the village and to apply for government assistance and projects in order to accommodate these needs. We found that there were discrepancies between the official functions of the JKKK and what actually was done, indicating a lack of collaboration/communication between JKKK and the villagers themselves. For example, instead of meeting monthly (as officially intended), the JKKK only met three times in 2001 year, and had no further meetings planned until the next year (Table 3.4). Although invitations to the meetings were distributed to all households in Pauh, looking through the minutes of these meetings we found that on average less than 20 villagers (including the 6 JKKK members) participated in the meetings, while the village headman was always absent.

Table 3.4 Theoretical functions and what is done in reality by the JKKK of Kpg Pauh.

Theoretical function	What is done in reality
Organise meeting to discuss village problems and organise community activities once a month.	This has happened only 3 times in 2001, with no plans for more meetings until 2002. Less than 30% of the invited villagers attended the meetings, and even less participated in the set tasks.
Invite JKKK members from other villages (e.g. Sinulihan, Tulid, Kindasan) to discuss how to implement government projects.	No record of this happening in 2001, and nothing is planned for the remainder of the year.
Give advice to people on how to grow cash crops, i.e. taro, maize, cassava, long beans and groundnuts and establish more permanent agricultural systems (e.g. homegardens).	At least 3 farmers expressed interest in growing cash crops and/or establishing homegardens, but complained about the absolute lack of advice extended to them through the JKKK. No information meetings were set up in 2001 so far, and nothing is planned for the remainder of the year.
Request government agencies to send officials to the village twice a year and host meetings between villagers and these govt officials.	No record of this happening in 2001 so far, and nothing is planned for the remainder of the year. The Forestry Department confirmed that there have not been any meetings with people in Kpg Pauh.

Several informants outside Pauh expressed that lack of organisation characterised the village, and some pointed at lack of cooperation between the JKKK and the village headman as the reason.

The institution of village headman is not integrated into the JKKK, and the headman does not need to be reappointed, but holds his seat unless he breaks the law, or grossly neglects his job. The theoretical functions of the village headman are, according to the JKKK chairman, to look after the peace and harmony of the village, and to assist villagers with social problems. He can also function as the leader of the village and be member or chairman of the JKKK, as it is the case in Kpg Sinulihan. In Pauh, however, it seemed that the village headman was distanced from the community. He himself operated a private transport company, and had learnt to be ‘different’ by seeing the world outside Pauh. He was better educated than the average and in general quite different from the average villager who made a living from farming. When asked what his future visions for the Pauh were, he said that it was difficult to develop the village, since the villagers prefer to live in ‘the old way’, meaning for example their way of only doing subsistence agriculture. ‘People are not aware of the potential income they can raise from farming. It seems like they are not interested in money or that they don’t understand the value of it’. He stated that he wanted to act as a role model for villagers, encouraging them to modernise and integrate into the market economy.

The official channel through which the JKKK applies for development projects and other funds is via the district office, and subsequently, the State Development Office, often in

accordance with recommendations from the village headman. Technically these offices are not politically inclined and projects are awarded based on the need of the community. This is where the rapport between JKKK and headman, and the effectiveness of the JKKK is essential if the village wants part of the funds allocated for rural development. But collaboration and communication between the headman and the JKKK was very poor and neither was aware of what the other was doing. From a more political perspective, a potential conflict may exist in the fact that the chairman of the JKKK is politically appointed by a different party (UMNO) than the one that the village headman and the majority of the villagers support, according to an informant. The sole fact that JKKK members were appointed rather than elected means that they lack the support of the village, elaborated the informant Seen in context of the political history in Sabah, the last decades with disputes between the former state PBS government and the federal government coalition dominated by UMNO (see e.g. Yusoff, 2000; Loh Kok Wah, 1996; Doolittle, 1999), political inclination could appear to play a role in the lack of cooperation between the two leading institutions in Pauh.

One villager said that one of the reasons why they did not organise in the village, for instance to get governmental support or to clean up the village, was that they had to take care of their own family's needs first. In Sinulihan, both the JKKK and the village headman, who is a member of the JKKK, were capable of motivating, mobilising and organising the villagers to do communal work. Sinulihan had monthly communal clean-up sessions, and also, through community collaboration, managed to obtain government assistance for their cocoyam scheme.

Farmer groups

There were no farmer groups (*unit peladang*) in Pauh as there were in Sinulihan. The function of farmer groups is to apply for agricultural projects aimed at a transition to cash-crops from the Department of Agriculture. According to the agricultural officer, a group of farmers are better able to put up some of the capital required to cover the transition costs to cash-cropping. The Department therefore encourages the formation of groups and assists them with the remaining costs. The Department only supports farmers - or farmer groups with the most potential for success; hence the groups or individuals that are most organised and progressive are normally preferred ‘because if they are not, they will not implement what they learn’. After the project period ends, maintenance support is given for 3 years. This project strategy is pursued in order to maximise the possibility of other communities benefiting from the ‘spill-over-effect’ derived from the groups or individual farmers who get projects/assistance/subsidies, but means that ‘disorganised’ Pauh has little chance of entering the ‘good development cycle’. The JKKK and village headman are the link between the village and the Department, in the sense that applications for projects have to be recommended by these. From them it goes to the relevant offices, where recommendations by individual officers carry a lot of weight in granting subsidies or any form of assistance. This

means that the JKKK and the village headman have to play an active role in their relationship with Department officials, which they do not.

According to the chairman of the JKKK a farmer group with ten members was formed in 1986, but dissolved in 1999, because the group was inactive. 'The reason why they were not active was that they were illiterate, they could not write, read or speak Malay. They were appointed as members by the Department of Farmers Association, Keningau. The members did not know how to operate the group, apply for projects and were ignorant of the government policies and procedures, and were only appointed because they were members of the right political party', he elaborated. The chairman of the JKKK did, however, intend to set up a farmer group again sometime in the future.

Cultural aspects: Many informants, both inside and outside the village pointed at the Murut culture as a restraint against development, since it is traditionally connected with thinking only one day ahead and a more casual attitude towards work. With regards to organisation, they did sometimes organise communal work, to help each other in the fields, but it not seem to be an important part of a Murut culture as such. The aspect of helping one an other also was seen in the way villagers helped others if they were in need, if a family member had died, etc. Some said that it was not part of their culture to appoint a leader, which one implied as a reason for the village headman's reluctance against acting as a leading figure in the community. With respect to applying for projects or assistance from e.g. the Agricultural Department, some argued that this was not easy for them as the Murut is a culture of giving rather than taking or asking to be given. Blaming the Murut culture for Pauh's disadvantage compared to other villages seemed to be an accepted view many places outside Pauh. However, as none of us had the educational background nor time to evaluate the real influence of culture on the functioning and livelihood strategies of the Pauh community, we are hesitant to make any conclusions about its effects and the extent of its influence.

3.6 Summary discussion

Although the Sabah government aims to reduce poverty and initiate development by encouraging rural communities to become more involved in the market economy, this is a transition that requires an investment of capital and labour that is unavailable to the majority of villagers in Pauh. The agricultural land is suitable and therefore does not represent a constraint to the transition. The current agricultural practises do not have a major impact on the environment and the production system at present appears to be ecologically sustainable. However, transition to commercial production of cash crops may well change this situation. This is especially the case if pesticides are used in large amounts and crops that are unsuitable in checking erosion from slopes are planted on steep land. Furthermore, annual cropping would have to be complemented with increased agrochemical inputs in order to counterbalance nutrient exports and increased incidence of pests and diseases, currently

checked by the long fallow periods. This might lead to a higher dependence of farmers on costly external inputs, while at the same time degrading their land, therefore baring grave socio-economic and environmental consequences.

The low level of education in Pauh makes it difficult for the Pauh people to fully comprehend the policies and procedures that have to be met, and therefore they may not see the opportunities that they have. The villagers' link to these opportunities is furthermore weakened by the fact that the community suffers from poor organisation within and between institutions that are crucial for the facilitation and implementation of government assistance and development strategies. This is worsened by the fact that the village has no force capable of mobilising, motivating and leading the community, especially as the criterion for obtaining subsidies and rural development projects is that the benefiting communities are motivated to apply themselves, and show ambition, i.e. communities that already display considerable potential. The lack of these assets means that the Pauh community has entered a negative spiral, from which it is difficult to exit.

4. Conclusion and perspectives

In terms of physical capital Pauh can be considered a poor village. Although the agricultural land is fairly abundant and of sufficient quality for current agricultural production, with 87 percent of the inhabitants falling under the official poverty line and 50 percent of these even considered hardcore poor, villagers have little financial assets. In terms human capital, the village suffers from low education levels. Health issues and labour constraints further impede productive and educational potential. Social capital, such as social networks, is to a certain extent present in the sense that the villagers have a tradition of helping each other. The definition of social capital also refers to social networks that are needed to facilitate collective action among individuals. The institutions responsible for facilitating this collective action is the JKKK, and in his role as a 'leader', the village headman. In this context, the village as a whole suffers from severe lack of social capital, since neither the village headman nor the JKKK performed their functions sufficiently.

The way forward is potentially through better education, since it could create a public inheritance beyond the community, and thereby function as a link to the more modern society outside Pauh. In that sense it could facilitate a modification in the villagers' attitude towards development and their natural fear of change. Better education may also manifest itself in more efficient organisation and co-operation in the village, and thereby act a catalyst to the development opportunities made possible by the state. As the attitude towards education (lack of 'internal motivation') is partially a cause of the general low educational levels in the families, the process of attitude transformation through education is slow and would rely on spill-over effects from villagers that have become educated. The Sabah development policy should therefore aim at easing the access to training and education for those ready to embark on it through direct financial support, as well as generally encouraging and facilitating

education at all levels in the school system. Improved education, ameliorated access to income opportunities and a transition from subsistence agriculture into more commercial farming systems could all go hand in hand.

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