

ASSESSING THE VIABILITY OF TWO RICE FARMING SCHEMES WITH RESPECT TO CHANGING LIVELIHOODS IN KAMPUNG SEBANDI, MALAYSIA

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1 Literature review

Malaysia consists of two major parts, Peninsular Malaysia, which includes 11 separate states, and a part of the island of Borneo, on which the two states of Sabah and Sarawak are situated. Malaysia has a population of 23 million people of which approximately 20% live in Borneo (Danced, 2001). The country has experienced rapid economic growth since the 1970s and has reached “Newly Industrialized Economy” (NIE) status (Airriess, 2000), which puts it in the World Bank’s upper-middle-income group of developing countries (Barraclough & Ghimire, 2001).

1.1 Government policies

The Malaysian government has since the 1970s had an overall goal to reduce poverty and income gaps between ethnic groups. The strategy to achieve this goal was the New Economic Policy (NEP), created to share the benefits of economic growth, so that any economic inequality between different ethnic groups would be eliminated. Focusing on economic growth, the government wanted to provide increased employment and economic opportunities for the poor and needy people.

Having experienced economic growth on the national level, some of the social inequalities present in the country have been eliminated. In 1991, the National Development Policy (NDP) was introduced. The NDP retained the main elements of the NEP, but at the same time introduced new concerns. The new concerns included social and spiritual values, and addressed the importance of the protection of the environment and ecology. The federal strategy; Vision 2020, which was stated in the 1990s seeks to redefine Malaysia as a nation with a homogenous, yet multi religious and ethnic population, as well as it seeks to create a higher degree of democratisation, industrialisation and more efficient agricultural production (www.jaring.my/isis/mbc/2020.htm)

1.2 Rural development – institutions and schemes

Economic progress, however, has not eradicated the large income gap between regions and between rural and urban areas; persistent rural poverty still exists (Hafner, 2000). The state-government of Sarawak has initiated a number of programmes in order to reduce poverty among small-scale farmers through the introduction of cash crop farming (such as New Concept strategy). These programmes predominantly operate on NCR-land (Native Customary Rights Land), and carry different approaches and conflicts. This is due to the states desire to develop these rural areas and peoples. The NCR-land is one of five categories or land codes of state land. These are; Mixed zone land (no restrictions on who can claim/purchase land entitlements), Native area land (natives can claim land entitlements), Native customary land (land held under no title, but natives have customary rights if they have been settled on the land earlier than 1958), Reserved land, and Interior area land (government lands reserved for forest) (Cramb & Wills, 1990).

Under the above mentioned national strategies and policies the NAP (New Agricultural Policy) is directly focused at sustainable rural development, as well as promoting cash crop production (www.agrolink.moa.my/dnp/dnp3/dnp/new.html).

SLDB (The Sarawak Land Development Board) is, like the national FELDA (Federal Land Development Authority), promoting and implementing plantation schemes. There are, however, several conflicts encountered in these schemes, which could to some extent be due to institutional

dissonance (Bromley, 1985 in Cramb & Wills, 1990); the formal institutions contrasting with the informal institutions (the small scale farmer's rules and customs). This could for example be the discrepancy between individual titles to land in relation to the Iban communities claim as a unity.

SALCRA (the Sarawak Land Consolidation and Rehabilitation Authority) is an institution, which considers institutional dissonance, and tries to develop NCR-land in order to benefit the informal owners and fulfilling their needs. In Sarawak, each land-development scheme experience various difficulties for the smallholders involved; with complications being due to the mentioned entitlements to land, deviation from traditional land-use methods and lack of technical expertise (Cramb & Wills, 1990).

Until recently, poverty in Malaysia has been measured as a lack of income; its multi-dimensional nature has therefore not been considered. This lack of understanding can be said to have hindered the strategies of the Malaysian government in eradicating poverty (Nair, 2001). Taking a more holistic approach to poverty, it can be measured as a lack of assets incorporating: human capital (skills, education and information), economic capital (income, property and holdings), natural capital (water, soil, etc) and social capital (networks) (Berma, 2000).

1.3 Iban society

Native inhabitants of Borneo are commonly referred to as "Dayaks," which covers a wide range of indigenous groupings, each with their own culture and language. The term Dayak is normally designated to groups who are non-Muslim and non-Malay, such as the Iban, which mix traditional customs with Christianity. They are as Dayaks considered settled agriculturalists, who mostly live in longhouses, are oriented to rivers, and their dominant mode of subsistence being shifting cultivation of hill rice (King, 1993). The Iban constitute the largest population group in the state of Sarawak.

7.5% of the population in Sarawak is considered hardcore poor (hardcore poverty defined as income levels below half of the subsistence level (Danced, 2001)), and the majority of the 7.5% are Iban. This is, according to Berma (2000), due to limited access to infrastructure (education etc.) and their traditional socio-economic structure (human, economic, natural, and social capital), hence a restricted access to a pool of livelihood resources, as we will return to in section 3.1.

1.4 Shifting cultivation and other land use strategies

Traditionally shifting cultivation of hill-rice has been the most common agricultural system in Malaysia (Cramb, 1988), and is still widespread in Sarawak (Barraclough & Ghimire, 2000). It is characterised by the clearing of forest in small plots of land, which is cultivated for a short period (1-3) years and left for a long fallow (5-20 years) (Mertz et al., 1999). Hill-rice is the focus of many social and religious activities in the community, thus having an importance going beyond pure subsistence. Intercropping with vegetables and other crops is normal, and more permanent modes of farming, especially rubber, pepper, cocoa and oil palms, is often seen to be a very important source of cash income when prices are good (Cramb, 1988, Mertz et al., 1999, Barraclough & Ghimire, 2000). Thus, farming systems may take a variety of forms as farmers often pursue multiuse strategies, which could also include off-farm work. These strategies may stem from a desire to minimize risk by diversifying production, and a desire to pursue income-generating activities other

than those of pure subsistence farming. The growing of cash crops may in part also be due to the government's support and subsidisation of these (Mertz et al., 1999).

Population growth puts pressure on existing agricultural land to produce higher yields. A decrease in fallow periods has to some extent earlier been seen to accomplish this, although carrying the imminent cost of exhausting the soil of nutrients (Cramb, 1988). As an alternative to decreasing fallow periods more forest can be cleared, thus spatially increasing the area of agricultural land and therefore the potential yields. Shifting cultivation practices have thus been connected to deforestation, excessive land use and low yields. However, this may illustrate a distorted picture of the situation, as the clearance of land for shifting cultivation agriculture constitutes only a small percentage of the deforestation of primary forest (logging considered the major direct cause), with secondary forest usually being preferred. Most shifting cultivators now seem to maintain sustainable fallow periods; thus the expansion of the agricultural sector is not predicted to lead to major deforestation (Barraclough & Ghimire, 2000).

1.5 Wet rice cultivation

In order to increase food production and to develop rural areas, wet rice cultivation has been emphasized and supported by the local and national government. The cropping of rice is normally limited by the rainy season, but irrigation allows it to be grown year-round. In addition, improved varieties of rice (introduced in combination with inorganic fertilizer and pesticides as part of the "Green Revolution", as we will return to in the final report) have a shorter maturation period, which makes it possible to grow two or more crops annually, leading to increased yields via temporal intensification (Jirström, 1996). Nevertheless, intensive rice cultivation systems may introduce negative environmental impacts; i.e. groundwater exploitation and pollution (by a high use of pesticides), declining soil organic matter, soil compaction, pests and diseases. In traditional farming systems, intercropping and crop rotation work as preconditions for pest control, but intensive year-round monoculture systems favour pests, such as weeds and insects, and as such promote dependency on a high input of pesticides, which in turn often leads to other complications (resurgence of potential pest, pest resistance to pesticides and thus increased risks for farmers) (Jirström, 1996).

After this brief introduction to the broader Malaysian context, in regard to policies, institutions, culture, and mode of production, we will proceed on to the specific local level of our area of investigation; the Iban village of Kampung Sebandi, Sarawak.

In the next chapter we will seek to outline the problems faced by the villagers and work out our objectives for the field trip, as well as the research questions we will address during our stay there.

2 Problem statement

Our study area is the village of Kampung Sebandi, in the state of Sarawak. The Iban community in Kampung Sebandi was resettled to the area in 1955, in an effort to alleviate poverty in their native area due to repeated natural disasters such as landslides. A wet rice-farming scheme was introduced in 1980s by the Department of Drainage and Irrigation (DID) and the Agriculture Department, but after several years of operation it eventually proved unproductive, presumably due to crop failure and irrigation problems. Currently a Taiwanese company is involved on a sharecropping basis, though results are to be seen. Whether this arrangement is part of the New Concept strategy and whether the organization is a Joint Venture Company (JVC) is not clear, but these are some of the issues we will look into during our stay in Kampung Sebandi.

According to villagers, insect pests and birds are some of the problems associated with the scheme. Other problems may include water pollution, as the villagers claim, they cannot drink or bathe in water from the nearby Kayan River. Most farmers have now resorted to hill rice farming.

The aim of our work in the village will therefore be to:

- 1) Analyse the problems initially encountered with the wet-rice scheme under the Department of Drainage and Irrigation (DID) and the Agriculture Department.
- 2) Assess the viability of the current share-cropping arrangement (with the Taiwanese company) in terms of sustainable alternatives to land use.
- 3) Analyse the communities changing livelihoods and expectations for the future.

We presume the problems encountered with wet-rice cultivation under the initial scheme, as well as the problems with the current arrangement; have a series of causes, which should be examined from many perspectives. Combining information from relevant literature with our present knowledge about the assignment, we have made four working hypotheses, which will serve to help us in gathering appropriate data needed to assess the situation.

We assume that the failure of the wet-rice cultivation system is partly due to:

- a) Institutional problems:
 - The structure of the current and former arrangements and organization of production, top-down approaches, conflicts involving land tenure issues.
- b) Pest problems and diseases in the crop fields:
 - Insects, rats and birds, weeds, plant diseases and fungus attacks.
- c) Irrigation problems:
 - The topography of the area (sloping fields), the stability and source of the water supply, lack of maintenance of the irrigation pipes and pumps.
- d) Alternative choices and desires of the villagers:
 - People putting time and labour into other activities such as hill rice farming, cultivation of other cash crops, off-farm work, education, migration.
 - A lack of skills in wet-rice cultivation, lack of required inputs (seeds, fertilizer, pesticides) if not provided by the scheme/company, seasonal lack of labour.

These hypotheses will be tested during our field trip in Kampung Sebandi, in order to answer the assignments stated previously. As a framework for the testing of the four hypotheses, we will in the following chapter outline our guiding principals for identifying relevant indicators. These are the concepts of sustainability and the sustainable livelihood approach.

3 Establishment of Framework

In order to analyse the outcome of our fieldwork in Kampung Sebandi, and establish an overall framework for our assignment, we will use relevant approaches for working with rural livelihoods in less developed countries. In analysing a research area, which includes ecological, socio-economic, and human considerations, it would be advantageous to utilize an approach, which encompasses all three aspects, while at the same time providing indicators for assessing the viability of the system. Moreover, there are a number of concepts, which definitions and uses we find essential in this assignment, and we will therefore clarify and discuss these before use.

3.1 Sustainable livelihood approach

The sustainable livelihood approach (Scoones, 1999) (see appendix F) considers rural development, poverty reduction and environmental management, and can be applied at different scales ranging from household to national level. The definition of a sustainable livelihood is according to Chambers and Conway (1992) in Scoones (1999):

“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, maintain or enhance its capabilities and assets, while not undermining the natural resource base” (Scoones, 1999).

In order to integrate indicators for assessing the livelihood, we apply the Danish philosopher Lübcke’s definitions of sustainability. Lübcke (1995) subdivides the broad concept of sustainability into *ecological, economical and social sustainability*. The crucial point in these definitions, are the possibilities of achieving a satisfactory level of yields, in each of these subcategories, while conserving the possibility of reproducing an equal amount over a limited period. Although we do not want to go into details of the three definitions in this synopsis, it is essential to stress that the concepts of reproduction of yield assume fundamentally different meanings in the three definitions.

In regards to ecological sustainability, the extracted yields from the ecosystem and the possible reproduction of it, deals with subjects such as biomass, species and substances. *An ecological system can be said to secure an ecological sustainable yield of biomass differentiated by species, if it based on stabile symbiotic relation to the surrounding world (especially a stable balance of substances and energy), on a yearly basis is capable of reproducing that yield, which is removed from the system (Lübcke, 1995).* [Own translation]

The focus of economic sustainability is altered significantly; thus transaction of economical units can occur, which expands the possibilities of substitutions between different forms of capital; hence; substitution no longer being restricted to occur, only between the same species, substances or biomass (Lübcke, 1995). In addition to the demand for an economically sufficient yield, a sustainable economy also needs to valorise externalities caused by production and internalise them in the economy via regulations (quotas, fines etc.). *An economical system can be said to secure an economical sustainable yield, if and only if 1) All the externalities are internalized 2) the system (based on a stable relation to the surrounding world – especially a stabile balance of payments) is*

capable of, within a given period, to reproduce the economical yield, which have been removed from the system (Lübcke, 1995). [Own translation]

Nonetheless, economic sustainability cannot account for social phenomenons or social limitations to the economy. Hence, the concept of social sustainability puts emphasis on reproduction and yields of welfare goods and the distribution of welfare. *A social system produce a sustainable yield of various welfare goods and a sustainable distribution of welfare, if the system on the basis of a stable relation to the surrounding world (a stable balance of power) is capable of producing the same yield of welfare goods with the same distribution of welfare, at the end of the period as it was at the beginning (Lübcke, 1995). [Own translation]*

For these, different forms of sustainability indicators can be applied according to the research area (for operationalization of these see appendix A).

The five key indicators for assessing sustainable livelihoods according to Scoones' (1999) approach are:

- Employment (income, production, recognition of being engaged in something worthwhile)
- Poverty reduction (poverty level is a key criterion in assessment of livelihood)
- Well-being and capabilities (capability approach by Sen (1984, 1987): security, happiness, stress, vulnerability, etc.)
- Livelihood adaptation, vulnerability and resilience (stresses and shocks)
- Natural resource base sustainability (reliance on natural resources; stress or permanent decline)

In order to create feasible livelihoods, there has to be a pool of resources to utilize. Livelihood resources are divided into four types of capital:

- Natural capital (soil, water, etc.)
- Economic/physical capital (cash, credit, savings, production equipment, etc.)
- Human capital (skills, good health, ability to labour etc.)
- Social capital (networks, social claims, associations, etc.)

In examining sustainable livelihoods, the connections between the complex and dynamic livelihood processes must be resolved, with the investigation of combinations of different strategies (agricultural intensification, off-farm employment, migration etc.) and institutions (institutional processes create restrictions or opportunities to sustainable livelihoods. Formal and informal institutions mediate access to resources and effect the composition of livelihood strategies). Hence, analysis of strategy combinations and institutions is a key part of this investigation (Scoones, 1999).

In our final report, we will consider the approaches put forth by Rigg (1998) (correlating labour diversification and off-farm employment, with response to misguided government policy, i.e. institutional dissonance), and by Haan (1999) (discusses specific strategies; migration and the different kinds of migration (circular, permanent, individual, family, temporally, etc.), and also reviews different reasons for migration). We have chosen to associate the indicators in a table together with the relevant methods we will use (see appendix A).

In the following chapter we will outline the issues, which will be covered, as well as the relevant methods for addressing these issues (also see appendix A & B).

4 Methodology

Pilot-study (2 days) (see appendix B):

- Transect walk of the area (making a sketch of the village and field area and irrigation system)
- Locating and interviewing key informants (getting an overview of possible problem in the wet-rice farming system, including the share-cropping arrangement with Taiwanese company)
- Selecting households for interviews (see if it is possible to interview all households)
- Test questionnaires (for possible alterations)
- Determine if participatory methods are appropriate (can the villagers spare the time for different participatory methods and is it possible to form focal groups)
- Informal conversation with villagers if possible

Field work (8 days) (see appendix B):

- GPS (mapping of the topography and field areas and irrigation canals)
- Sampling: categorizing of fields with similar conditions (type of vegetation and stage of maturation, slope, and water availability). In each category specific fields and subplots will be selected randomly. These subplots will be 1m² and analyzed for:
 - Weeds; what are the most common species, how often they occur.
 - Crops; health condition (including diseases or fungus), effects of water availability or fertilizer availability (i.e. color)
 - Insect pests; trapping flying insects in light trap, slugs and surface dwelling insects in cups placed in the ground, or for wet-rice fields using a net to catch insects in the water.
 - Identifying bird pests.
 - Water sampling; both from river and fields to search for pesticide and fertilizer pollution, sampling of fauna from the river in search for species indicating the pollution level. Should be collected at the river upstream, midstream and downstream.
- Using key informants and observation, we will determine the causes of any malfunctions within the irrigation systems, i.e. broken pumps and pipes, inefficient drainage, maintenance requirements (see appendix E).
- Questionnaires, detailed survey of opinions of residents and facts with respect to farming practices, socio-economic background, livelihood strategies and expectations for the future (see appendix C).
- Participatory mapping and calendars of livelihoods in order to understand the villagers' perceptions of time and space.
- Semi structured interview with officials and the headman of the village to get the in depth understanding of the community structure and its relation to the national government policies (see appendix E).
- Focal groups to investigate specific intergenerational and gender issues (see appendix D).

In order to develop a richer picture of the village, initial informal conversations would be beneficial, although not appropriate to be scheduled. Secondary data (maps, reports, statistics etc.) will be used if available and we assume that the collaboration with Malaysian students will be very rewarding.

Some of our hypotheses, methods and issues may be changed during our pilot study in Malaysia, due to more accurate information obtained in the field. The approaches, concepts, and background information will be further elaborated in the final project.

5 References

- Airries, C.A.** (2000), *Malaysia and Brunei*, chapter 13 in *Southeast Asia. Diversity and Development*. Editors Leinbach, T.R. and Ulack, R. Prentice Hall, New Jersey.
- Barraclough, S.L. & Ghimire, K.B.** (2000), *Agricultural Expansion and Tropical Deforestation*. Earthscan Publications Ltd, USA
- Berma, M.** (2000), *Iban Poverty: A reflection on its causes, consequences and policy implications*, Universiti Kebangsaan, Malaysia.
- Cramb, R.A.** (1988), *The Commercialization of Iban Agriculture*, Chapter 7 in *Development in Sarawak: Historical and contemporary perspectives*, Monash Paper on Southeast Asia – No. 17. Centre of Southeast Asian Studies, Monash University.
- Cramb, R.A.** (1993), *Shifting Cultivation and Sustainable Agriculture in East Malaysia: A longitudinal Case Study*. Agricultural systems 42. Elsevier Science Publishers Ltd, England.
- Cramb, R.A. & Wills, I. R.** (1990). *The role of traditional institutions in rural development: community-based land tenure and government land policy in Sarawak, Malaysia*. World Development 18, pp 347-360.
- Danced** (2001), *Malaysian-Danish Country Programme for Cooperation in Environment and Sustainable Development (2002-2006)*. Danced/EPU 2001.
- Haan, A.** (1999), *Livelihoods and poverty: The role of migration – a critical review of the migration literature*, The Journal of Development studies Vol. 36, pp 1-47
- Hafner, J. A.** (2000), *Perspectives on Agriculture and Rural Development*, in *Southeast Asia. Diversity and Development*. Editors Leinbach, T.R. and Ulack, R. Prentice Hall, New Jersey.
- Jirström, M.** (1996), *In the wake of the Green Revolution. Environmental and socio-economic consequences of intensive rice agriculture – The problems of weeds in Muda, Malaysia*. Meddelanden från Lunds Universitets Geografiska Institutioner, avhandlingar 127. Lund University Press, Lund.
- King, V.T.** (1993), *The peoples of Borneo*, Blackwell, Oxford, UK.
- Lübcke, P.** (1995), *Bæredygtighed og velfærdsstat, Miljøet, markedet og velfærdsstaten*, Fremad/AIF.
- Mertz, O., Christensen, A.E., Højskov, P. & Birch-Thomsen, T.** (1999), *Subsistence or cash: strategies for change in shifting cultivation*. Geografisk Tidsskrift, Danish Journal of Geography, Special Issue, 1, 1999.
- Rigg, J.** (1998), *Rural – urban interactions, agriculture and wealth: A Southeast Asian perspective*. Progress in human geography 22, 4, pp 497-522.

Scoones, I. (1999), *Sustainable Rural Livelihoods A Framework For Analysis*, IDS WORKING PAPER 72.

Sen, A., (1982), *Poverty and famines: An essay on entitlements and deprivation*, Clarendon Press, Oxford.

Web addresses:

www.jaring.my/isis/mbc/2020.htm

www.agrolink.moa.my/dnp/dnp3/dnp/new.html

Appendix A

Ecological issues					
Key Issues	Area of Investigation	Indicators		Methods	Notes
Balance of Substances	Nutrition	Use of organic and inorganic fertilizers		Water sampling	Chemicals
				Soil sampling	Organic matter, etc.
				Questionnaires	Quantity applied on seasonal base, etc.
				Participatory working calendar	Do.
		Health conditions of crops		Crop sampling	Analyse for lack, sufficiency or surplus of nutrition during growth season
				Questionnaires	Do.
			Participatory working calendar	Do.	
	Pesticides	Diseases		Crop sampling	Specific indicator genera
				Questionnaires	Longer time perspective on specific indicator genera and general problems
		Fungi		Crop sampling	Specific indicator genera
				Questionnaires	Longer time perspective on specific indicator genera and general problems
		Weeds		Weed sampling	Specific indicator genera
				Questionnaires	Longer time perspective on specific indicator genera and general problems
		Animals pests	Birds	Mist net	Specific indicator genera
Photography					
Questionnaires				Longer time perspective on specific indicator genera and general problems	
Rodents			Traps	Specific indicator genera	
			Questionnaires	Longer time perspective on specific indicator genera and general problems	
Insects			Light trap	Specific indicator genera	
		Questionnaires	Longer time perspective on specific indicator genera and general problems		
Balance of Energy		Mechanisation	Level of applied technology		Questionnaires
	Participatory working calendar				Do.
	Irrigation	Water sufficiency		Visual inspection	Identifying malfunctioning and dis-maintenance
				Mapping of irrigation system using GPS, GIS	Identifying situation and slope of irrigation canals in comparison to location of fields
				Questionnaires	Longer time perspective on specific and general problems related to the irrigation system
				Semi-structured interviews	Longer time perspective on specific and general problems related to the irrigation system. Preferably with key informants from DID and other relevant institutions
				Participatory working calendar	Query in regards to the villagers view on problems with water sufficiency on a seasonal basis and other related issues

Appendix A

Ecological issues								
Key Issues	Area of Investigation	Indicators		Methods	Notes			
Yields and reproduction of yields over time	Estimate of cropping areas, yields, productivity pr ha, and labour productivity, and the development in these over time	Wet rice		Mapping of fields using GPS, GIS,	Physical/natural capital. Estimate of total cropping areas and areas pr. household			
				Questionnaires	Longer time perspective on total cropping areas and areas pr. Household			
				Participatory working calendar	Working practices pr. household pr. crop on a yearly basis			
		Hill rice		Period of fallow	Mapping of fields using GPS, GIS,	Estimate of total cropping areas and areas pr. household		
					Questionnaires	Long time perspective on total cropping areas and areas pr. Household		
					Participatory working calendar	Working practices pr. household pr. crop on a yearly basis and also in a longer time perspective		
		Other cash crops		Pepper	Mapping of fields using GPS, GIS,	Estimate of total cropping areas and areas pr. household		
					Questionnaires	Longer time perspective on total cropping areas and areas pr. Household		
					Participatory working calendar	Working practices pr. household pr. crop on a yearly basis		
				Rubber		Mapping of fields using GPS, GIS,	Estimate of total cropping areas and areas pr. household	
						Questionnaires	Longer time perspective on total cropping areas and areas pr. Household	
						Participatory working calendar	Working practices pr. household pr. crop on a yearly basis	
		Oil Palm		Other	Mapping of fields using GPS, GIS,	Estimate of total cropping areas and areas pr. household		
					Questionnaires	Longer time perspective on total cropping areas and areas pr. Household		
					Participatory working calendar	Working practices pr. household pr. crop on a yearly basis		
				Subsistence crops		Vegetables	Mapping of fields using GPS, GIS,	Estimate of total cropping areas and areas pr. household
							Questionnaires	Longer time perspective on total cropping areas and areas pr. Household
							Participatory working calendar	Working practices pr. household pr. crop on a yearly basis
		Others		Others	Mapping of fields using GPS, GIS,	Estimate of total cropping areas and areas pr. household		
					Questionnaires	Longer time perspective on total cropping areas and areas pr. Household		
					Participatory working calendar	Working practices pr. household pr. crop on a yearly basis		

Appendix A

Economical issues								
Key issues	Area of investigation		Indicators	Methods	notes			
Balance of payment. Household integration in market economy	Income generating activities outside village		Occupations	Questionnaires	Subsistence- or cash income. Traditional or modern activities Human capital			
			Household members		Questionnaires	Gender – age differences Human capital		
			Work load	Pr. week	Questionnaires	Gender – age differences		
				Pr. month	Questionnaires	Do.		
				Pr. year	Questionnaires Participatory working calendar	Do.		
			Income	Pr. week	Questionnaires	Physical capital, classification of level of poverty		
				Pr. month	Questionnaires	Do.		
				Pr. year	Questionnaires	Do.		
			Income gap between rural and urban employment		Migration	Seasonal	Questionnaires	Income generating strategies, what kind of migration
						Participatory working calendar		Do.
	Statistics of Sarawak					Do.		
	Population growth	Permanent			Questionnaires	Do.		
			Participatory working calendar	Do.				
Statistics of Sarawak		Do.						
Externalities	Eluviations of Agrochemicals		Water quality	Questionnaires Water sampling	Natural capital			
	Erosion		Slopes and length of fallow	GPS and inclinometer, GIS Questionnaires	Do. Do.			
	Clearance of forest		Encroachment on primary/secondary forest	Questionnaires	Do.			
				Semi structured interviews	Do.			
				Statistics of Sarawak	Do.			
Income	Income generating activities in village	JVC farm work	Size of holding	Questionnaires GPS measuring				
			Income	Questionnaires				
			Dividende	Questionnaires Semi structured interviews				
		Non- JVC farm work	Size of holding	Questionnaires Semi structured interviews				
			Subsistence crops	Questionnaires				
			Livestock	Questionnaires				
	Non- Farm work	Fishing	Questionnaires	Natural capital, subsistence income				
		Hunting	Questionnaires	Do.				
		Gathering	Questionnaires	Do.				
	Diversifying strategies		Risks	Questionnaires, semi structured interviews, focal groups, informal conversation	What are the villagers choices of employment Traditional or modern			
			Benefits					

Appendix A

Social issues						
Key issues	Area of investigation	Indicators		Methods	Notes	
Balance of power	Institutional framework of Joint Venture Company	Provision of inputs		Questionnaires	Is the arrangement worthwhile for the villagers compared to other activities	
				Semi-structured interviews		Do.
		Provision of loans		Questionnaires	Do.	
				Semi-structured interviews	Do.	
		Power relations between community and trustee/private company		Questionnaires	Do.	
				Semi-structured interviews	Do.	
	Institutional dissonance?		Focal groups	Do.		
			Questionnaires	Top down arrangement? Institutional framework		
	Self-determination in joining scheme		Semi-structured interviews		Do.	
			Land legislation review	Do.		
Yield of welfare goods	Health	Average lifespan		Questionnaires	Human capital	
				Statistics of Sarawak		
		Child mortality		Questionnaires		
				Statistics of Sarawak		
	Education	Literacy		Questionnaires		
				Statistics of Sarawak		
		Years of schooling		Questionnaires		
				Statistics of Sarawak		
	Other social benefits	Health insurance		Questionnaires		
				Semi-structured interview		
				Statistics of Sarawak		
		Pension		Questionnaires		
				Semi-structured interview		
				Statistics of Sarawak		
		Social networks		Questionnaires	Social capital	
				Semi-structured interview		
Statistics of Sarawak						
Distribution of welfare	Land tenure	Ownership of land		Questionnaires	Physical capital	
				Semi-structured interview		
				Land legislative literature review		
		General land rights		Questionnaires		
				Semi-structured interview		
				Land legislative literature review		
		Land lease rights		Questionnaires		
				Semi-structured interview		
				Land legislative literature review		
	Employment	Jobs and career opportunities for different groups?		Ethnic	Focal groups	Human capital, institutional framework
				Gender	Focal groups	
				Intergenerational	Focal groups	
				Ethnic	Focal groups Questionnaires Informal conversation	
				Gender		
				Intergenerational		
	Aspirations	Alternative livelihood opportunities		Ethnic		
				Gender		
				Intergenerational		
	Cultural values	Expectations for livelihood and cultural changes		Ethnic		
				Gender		
Intergenerational						

Appendix B

Time Schedule

All tasks will be carried out by a minimum of two individuals, preferably a combination of Malaysian and Danish students. All students will shift tasks, so the same two students do not just do questionnaires etc.

Thursday, January 16: Joint preparation and consolidation of field study plan at UNIMAS.
Friday, January 17: <u>Transfer to community, pilot study.</u> <ul style="list-style-type: none">• Transect walk of the area (making a sketch of the village, field areas and irrigation system).• Locating key informants (identifying individuals with official status in the community, i.e. head of school, village headman, Taiwanese share-cropping company representatives, local government officials, SLDB officials, DID officials, etc.• Select households for interviews on Saturday
Saturday, January 18: <u>Initial field work, refinement of proposal and field methods.</u> <ul style="list-style-type: none">• Test questionnaires (find out whether participatory methods are appropriate to use with local community)• Interview key informants• Interview village headman• Focal groups (interview specific age or gender groups, i.e. women, youth)• Categorize field areas, distinguish various zones, i.e. vegetation, slope, soil quality.
Sunday, January 19: <u>Presentation of final project plan at District Council, Lundu (tentative location)</u>
Monday, January 20: <u>Field Work</u> <ul style="list-style-type: none">• Questionnaires carried out by two groups of two students• GPS mapping of village and field areas, mapping of topography using clinometers (not necessary if maps available)• Select sample plots for natural scientific testing methods
Tuesday, January 21: <u>Field Work</u> <ul style="list-style-type: none">• Questionnaires carried out by two groups of two students• Sampling of weeds and crops• GPS mapping of village and field areas, mapping of topography using clinometers (not necessary if maps available)• Set up insect light trap• Interview with key informants

Wednesday, January 22:

Field Work

- Questionnaires carried out by two groups of two students
- Sampling of weeds and crops
- GPS mapping of village and field areas, mapping of topography using clinometers (not necessary if maps available)
- Investigating irrigation system, identifying problems (with help of key informant)
- Empty light trap, relocate light trap

Thursday, January 23:

Field Work

- Questionnaires carried out by two groups of two students
- Sampling of weeds and crops
- Interview with key informants
- Empty light trap, relocate light trap

Friday, January 24:

Field Work

- Questionnaires carried out by two groups of two students
- Water sampling, sample aquatic fauna using nets and buckets
- Empty light trap, relocate light trap

Saturday, January 25:

Field Work

- Participatory calendar mapping of annual income-generating activities
- Focal group interview with village youth
-

Sunday, January 26:

Field Work

- Questionnaires carried out by two groups of two students
- Focal group interview with village women
-

Monday, January 27:

Field Work

- Interview with key informants
-
-

Does your household have any animals (livestock)?

○ If yes which and how many?

- Cows
- Hens
- Goats
- Mules
- Pigs
- Others

Does your wet rice suffer from any **diseases**?

- Which are the most common?
- When is it a problem (in what season/at what crop stage)?
- Has there been a change during the last ten years (increase, decrease)?

Do you use pesticides?

If yes:

- Which kind?
- How much do you use per area/field/crop?
- Has there been a change during the last ten years (increase/decrease)?
- What is the reason for this change (economic, availability, need)?

If no:

- Why not?
 - no need
 - not helping
 - too expensive
 - not available
 - use other treatment – explain which kind?

Does your wet rice suffer from **fungus attacks**?

- Which are the most common?
- When is it a problem (in what season/at what crop stage)?
- Has there been a change during the last ten years (increase, decrease)?
- Do you use pesticides?

If yes:

- Which kind?
- How much do you use per area/field/crop?
- Has there been a change during the last ten years (increase/decrease)?
- What is the reason (economic, availability, need)?

If no:

- Why not
 - no need
 - not helping
 - too expensive

- not available
- use other treatment – explain which kind?

Does your wet rice suffer from **weeds**?

- Which are the most common?
- When is it a problem (in what season/at what crop stage)?
- Has there been a change during the last ten years (increase, decrease)?
- Do you clear weeds by hand/mechanically?
 - Why/ why not?
- Do you use pesticides?

If yes:

- Which kind?
- How much do you use per area/field/crop?
- Has there been a change during the last ten years (increase/decrease)?
- What is the reason (economic, availability, need)?

If no:

- Why not
 - no need
 - not helping
 - too expensive
 - not available
 - use other treatment – explain which kind?

Does your wet rice suffer from **birds**?

- Which are the most common?
- When is it a problem (in what season/at what crop stage)?
- Has there been a change during the last ten years (increase, decrease)?
- What do you do about the problem?

Does your wet rice suffer from **rodents**?

- Which are the most common?
- When is it a problem (in what season/at what crop stage)?
- Has there been a change during the last ten years (increase, decrease)?
- What do you do about the problem?
 - Traps
 - Poison
 - Other

Does your wet rice suffer from **insects**?

- Which are the most common?
- When is it a problem (in what season/at what crop stage)?
- Has there been a change during the last ten years (increase, decrease)?
- Do you use pesticides?

If yes:

- Which kind?
- How much do you use per area/field/crop?
- Has there been a change during the last ten years (increase/decrease)?
- What is the reason (economic, availability, need)?

If no:

- Why not?
 - no need
 - not helping
 - too expensive
 - not available
 - use other treatment – explain which kind

Fertilizer

Do you use organic manure as fertilizer?

- From which animals?
- For which crops?
 - Hill-rice
 - Wet-rice
 - Pepper
 - Rubber
 - Oil palm
 - Vegetables
 - Others

How much per year/season?

Has the amount changed during the last ten years (increased/decreased)?

What is the reason?

Do you use inorganic fertilizer?

- For which crops?
 - Hill-rice
 - Wet-rice
 - Pepper
 - Rubber
 - Oil palm
 - Vegetables
 - Others

How much per year/season?

When do you apply it during the season?

Has the amount changed during the last ten years (increased/decreased)?

What is the reason?

- economic(either more or less money)
- availability
- need (crops/soil)
- others

Do you think your crops get the amount of fertilizer needed (too much/enough/ too little)?

- Why/ why not?

Share-cropping scheme

Are you involved in the current sharecropping scheme?

Are you satisfied with: (Grade each category)

	Very satisfied	Satisfied	Indifferent	Dissatisfied	Very dissatisfied	Why?/Why not?
Your initial choice to join the scheme						
Information given to you prior to joining the scheme						
Your influence on decisions made (when having joined the scheme)						
Support provided in terms of training/education						
Provision of inputs (seeds, agrochemicals, technology)						
Support provided in problem solving after joining the scheme (e.g. irrigation and pest problems)						
Your share of the profits						
The period of lease						
Any agreements to get your land back in the future						
Career opportunities compared to other ethnic groups						

Were you involved in the former scheme?

Were you satisfied with: (Grade each category)

	Very satisfied	Satisfied	Indifferent	Dissatisfied	Very dissatisfied	Why?/Why not?
Your initial choice to join the scheme						
Information given to you prior to joining the scheme						
Your influence on decisions made (when having joined the scheme)						
Support provided in terms of training/education						
Provision of inputs (seeds, agrochemicals, technology)						
Support provided in problem solving after joining the scheme (e.g. irrigation and pest problems)						
Your share of the profits						
The period of lease						
Any agreements to get your land back in the future						
Career opportunities compared to other ethnic groups						

Externalities

Does your household use water from river?

- For drinking
 - why/why not?
- For cooking
 - why/why not?
- For washing
 - why/why not?
- For bathing
 - why/why not?
- For cleaning
 - why/why not?
- For watering crops
 - why/why not?

Which problems with water from the river do you experience presently? Describe.

- taste
- smell
- clearness
- solids

- algae's
- sedentary animals
- crustaceans
- fishes

Do you think that the water from river is better or worse than 10 years ago in regards to:

- taste
- smell
- clearness
- solids
- algae's
- sedentary animals
- crustaceans
- fishes

Is there any times during the year, when water from river is more or less useable?

Has this changed in the last 10 years?

If yes, what reasons do you think there are for changes in water quality?

Mechanisation

Do you use any machinery/technology?

- Tractor
- Other

Has there been a change in use during the past ten years (increase, same, decrease)?

Irrigation

Do you have irrigation in your fields?

Consider how it functions according to your opinion:

- very well
- well
- indifferent
- bad
- very bad

Which do you think are the problems (if any)?

- broken pipes
- broken pumps
- sloping fields
- supply of water
- Other

Consider which of these two does most harm to wet rice yield? (Ranking)

	Diseases	Fungi	Weeds	Birds	Rodents	Insects	Irrigation-problems	Lack of nutrients
Diseases	-----							
Fungi		-----						
Weeds			-----					
Birds				-----				
Rodents					-----			
Insects						-----		
Irrigation problems							-----	
Lack of nutrients								-----
Total								

Hill rice

Do you grow crops on hillsides?

Do you experience declining yields on steep hills?

Which crops are you growing on these hills?

- Hill rice
- Cash crops
 - Which
- Subsistence crops
 - Which

How often do you have different crops in these fields:

- More than once a year
- Once a year
- Every second year
- Every third year
- Every 4-6 year
- 7-9 year
- Less than 10 year

Do you always grow crops in fields you have previously used?

- Why?
- Why not?

Do you think that these areas have expanded in the last 10 years?

What reasons does your household have for growing:

	Subsistence	Cash income	Religious	Culture & Tradition	Subsidies & land use schemes	Others
Wet rice						
Hill rice						
Pepper						
Rubber						
Oil palm						
Cocoa						
Vegetables						
Others						

Which off farm activities does your household have and what reasons does your household have for these?

	Subsistence	Cash income	Religious	Culture & traditions	Job & career opportunities	Others
Independent business						
Factory worker						
Handy craft						
Tourism						
Plantation work						
Forestry						
Fishing						
Hunting						
Oil work						
Others						

Have any of your household members moved outside the village?

	Sex	Age	Period	Reason	Permanent?
Member 1					
Member 2					
Member 3					
Member 4					
Member 5					
Member 6					

How much time is spent in your household on these activities and how much money is earned?

	Hours spent per day	Hours spent per week	Hours spent per month	Contribution to household income	Seasonal off-farm work (all or part of the year)	Contribution from people living permanently another place
Wet rice						
Hill rice						
Pepper						
Rubber						
Oil palm						
Cocoa						
Vegetables						
Others						
Independent business						
Factory worker						
Handy craft						
Tourism						
Plantation work						
Forestry						
Fishing						
Hunting						
Oil work						
Others						

What kind of security has your household got in form of assets?

- land
- house
- savings
- motor vehicles
- TV
- radio
- others

Commodity prices

What are the prices of:

- Electricity
- Agrochemicals
- Gasoline
- Water (for drinking?)
- Flour

- Education of children
- Health care
- (find indicators relevant for households)

How much money is spend on these?

- Pr. week
- Pr. month
- Pr year

Does spendings on these commodities take up an increased part *of cash income*?

- Compared to 10 years ago?

Does spendings on these commodities take up an increased part *of relative income*?

- Compared to 10 years ago?

Who in your household makes decisions about farming?

- Head of family
- Elder person
- Made after mutual agreement
- Other

In making these decisions, how important are: (Ranking)

	Prices in cash crops	Short-term security in food production	Long-term security in food production	Opportunities for quick earnings	Different work load in growing different crops	Traditions in cropping patterns	Investment for the future	Allocation of house-hold members to non farm jobs	Education of young house-hold members	Equality between genders
Prices in cash crops	-----									
Short-term security in food production		-----								
Long-term security in food production			-----							
Opportunities for quick earnings				-----						
Different work load in growing different crops					-----					
Traditions in cropping patterns						-----				
Investment for the future							-----			
Allocation of house-hold members to non- farm jobs								-----		
Education of young house-hold members									-----	
Equality between genders										-----
Total										

Is education provided in your language?

How long does it take to get to the school?

- How do you get there (by foot, bus...)?

Do your sons and daughters have equal access to education?

What is the cost of education?

How often are you not able to work due to illness?

What are the common diseases?

Does your household get the health care they need?

- Why/why not?

Do you have a health insurance?

What is the cost?

What will the income be?

When can you collect it?

Do you have a pension?

What is the cost?

What will the income be?

When can you collect it?

Appendix D

Focal group interviews for Women:

Education:

- Did you get the same level of education as your brothers?
- Do your daughters get the same level of education as their brothers?
-

Health:

-

Economy:

- Do you have equal right in decision making?
- Do you have your own money?
-

Labour:

- Subsistence
 - How much time do you use on these activities?
- Cash
 - How much time do you use on these activities?
- "Invisible workload"
 - What are these?
 - How much time do you use on these activities?

Future expectations:

- Do you value the education of your children equally? (gender)
- Do you think there is an equal opportunity for men and women to be involved in different jobs and to pursue different strategies?
- Do you have the same expectations for the future as your husband?
 - In regards to investments?
 - In regards to household strategies?

- What are your wishes for the future?
-

Focal group interviews for teenagers:

Education:

- How important do you think education is?
- Would you like to do the same as your parents?

Economy:

- How important is it for you to have cash income?

Future expectations:

- What do you think your job opportunities will be in the future?
- Would you like to move from the village in the future? Why?
- Do you think you have the same or more opportunities than your parents?
- Do you have the same opportunities as your brothers/sisters?

Appendix E (By Malaysian students)

Interview Questions

To acquire other necessary information besides the household survey, interviews with some keys informants will be carried out during the field trip. Below are some possible informants and interview questions:-

To District Officer

1. Why were the people of Kampung Sebandi resettled in the present area?
2. Were they given any permission by the authority to do so?
3. Was there any compensation given to the settlers for relocation?
4. Has the occupied land (by the villagers) ever been surveyed?
5. Are there any applications from the villagers for the alienation of land?
6. Are you aware of any governmental plan to solve the land tenure problem? What are they, if any?
7. What are the approved development projects for the village in the 8th Malaysia Plan (2001 – 2005)?
8. What other projects are ongoing or being proposed?
9. In your opinion, would it be more appropriate to maintain the Forest Reserve as a conserve area or to convert it to farmland for the villagers?
10. What are your other comments?

To Farmers

11. How many hectares would you normally farm per season?
12. When are the planting and harvesting seasons?
13. Is there any excess harvest for sale?
14. Where do you normally sell it?
15. Do you apply organic fertilizer?
16. Do you depend solely on burning of vegetation to fertilize your land or do you depend on chemical fertilizers or a combination of both?
17. Are there any serious pest problems?
18. How do you normally control weeds and pests?
19. Are herbicides, fungicides and pesticides used?
20. Do you practice crop rotation?
21. What is your fallow period?
22. Where is your main source of water for irrigation?
23. Do you have any water shortage problem during the dry season?
24. In your opinion, what are the most serious problems faced by farmers in the area?
25. From your experience, what crops are suitable for the area?
26. Was there any Government Assistance extended to the local farmers?
27. What type of Government Assistance do you require?
28. Have you ever heard of agro-forestry/community forestry before?
29. What do you think of agro-forestry? Do you want to participate in such project?

To the Headman/Community Leaders

30. What is the most significant change after moving to Kampung Sebandi (Hulu/Hilir)?
31. In your opinion, is life better off here than in...?
32. Did the Government give any promises to the villagers before moving them to...? Are these promises fulfilled?
33. Is there any property left behind in...? Do you still go back there?
34. How many households in your village have any titled land?
35. Have the villagers ever applied for land alienation? Are there any successful applications?
36. What are the committees set up in the village? How are the committee members selected? How frequent do they meet? What are their functions?

37. What are the facilities and amenities available here?
38. How do you request for facilities/amenities from the relevant authorities?
39. What are the most serious problems faced by your village at the moment?
40. What Government Assistance is most needed in this Kampung (Hulu/Hilir)?

To Villagers

41. Do you use the river water for bathing and washing?
42. Is the water fit for drinking and cooking purpose?
43. How is the water quality now as compare to before?
44. Does the river dry out during the dry season?

Appendix F

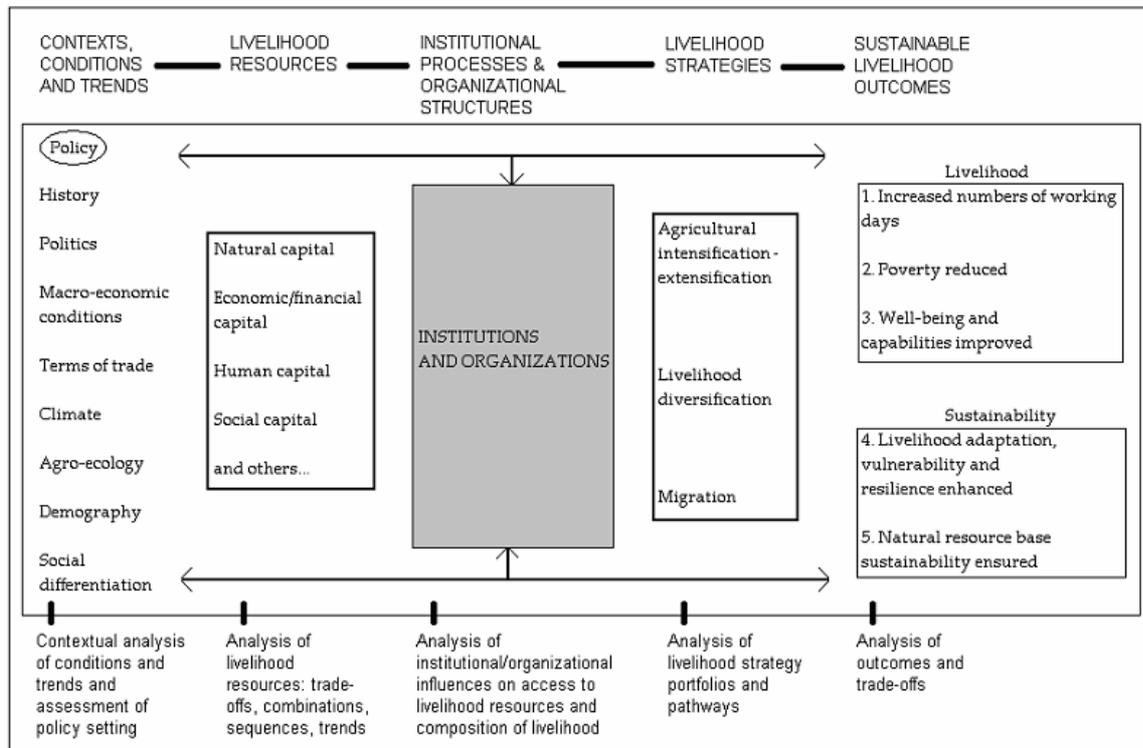


Figure 1: Sustainable rural livelihoods: a framework for analysis (modified from Scoones, 1999)

Changing livelihoods in Kampung Sebandi, Malaysia

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Abstract

This study investigates the changing livelihoods in the Iban village, Kampung Sebandi, Sarawak, Malaysia. The 'sustainable livelihood approach' (Scoones, 1999) is applied in order to cover the most important aspects of the general changes of the villagers' livelihoods, and the impact on these from the implementation of a high intensive wet rice production system (JVC). The field study was conducted during a ten-day stay, in an interdisciplinary cooperation with student from UNIMAS, Sarawak. It was found that the livelihoods are changing from subsistence production and towards cash-crop production or non-farm employment. The villagers are increasingly using diversification, intensification and migration strategies. In general, the available pool of resources (forms of capital) in the village is low. Participation in the JVC has until now not produced any elevation of the income level, the ecological consequences are uncertain and there is a widespread discontent by the villagers towards the JVC.

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1 Introduction

In rural areas in Southeast Asia, there is an increasing diversification of the household economy. The household economy is decreasingly orientated towards farming, and increasingly dependant on non-farm income, from migrated household members, or from members still living in the household, but traveling to nearby urban areas. Likewise, the rural activities are being diversified, getting more adapted to changing market prices and labor supply (Rigg, 1998).

The choices and strategies employed by the villagers in rural areas can be seen as a way of adapting to the local context, in regards to the agricultural potential of the land, potential opportunities outside the village, and the policies and institutions, which are influencing the potential benefits that the villagers can get from participating in different activities. In this way the household strategies can be understood as a way to maximize the possible benefits from allocation of it resources in different activities. Changes in local policies have a possible impact on, which income generating activities the locals choose to participate in.

In Malaysia, the management of natural resources is a matter for the state governments. In Sarawak, where the site for this field study is located, there has during the last ten years been a change towards large scale and cash-crop farming practices in state policies and strategies, in order to develop the rural areas (Songan, 2000). This change has influenced the everyday life of people in rural areas in many ways and at multiple levels. This study will look into these changes in livelihoods at household level in Kpg. Sebandi, Sarawak, and the impact of the implementation of a large scale commercial farming system.

1.1 Objectives

The study area of Kpg. Sebandi, Sarawak is an Iban community resettled to this area in 1955. A wet rice scheme was introduced in the 1980s by the Department of Drainage and Irrigation (DID) and the Department of Agriculture (DOA). This has now been replaced by a private company on a Joint Venture Company (JVC) basis with the local farmers, for the purpose of intensive production of wet rice. However, income from this arrangement is only one component of the villagers' livelihoods, and therefore our prime objective for the field study is:

To analyze the changing livelihoods, including the impact of a joint venture rice scheme, in Kpg. Sebandi, Malaysia.

In order to answer the objectives, we decided to investigate specific relevant areas such as:

- ❑ Governmental institutions, agricultural policies and changes in these.
- ❑ Real opportunities for the villagers to change their livelihood.
- ❑ Migration patterns
- ❑ Young villagers interest in farming
- ❑ Level and perceptions of education.
- ❑ Income and poverty levels
- ❑ Iban culture and informal institutions
- ❑ Gender relations.
- ❑ Natural resource base in relation to wet rice cultivation

1.2 Theoretical framework

In order to cover different aspects of the rural livelihoods in Kpg. Sebandi and tie these together, we use the ‘sustainable livelihood approach’ (Scoones, 1999), which provides indicators for assessing the viability of a given system and combines the different aspects in one approach. This theoretical framework encapsulates all the above-mentioned areas, and operates at different analytical levels, and thus offers the opportunity to analyze at indicator-, strategy- and institutional level in regards to livelihoods.

The definition of a sustainable livelihood is according to Chambers and Conway (1992) in Scoones (1999):

“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, maintain or enhance its capabilities and assets, while not undermining the natural resource base” (Scoones, 1999).

The five key elements for assessing sustainable livelihoods are:

- ❑ Creation of livelihood (income, production, recognition of being engaged in something worthwhile)
- ❑ Poverty reduction (real possibilities to generate a higher income relative to poverty measures)
- ❑ Well-being and capabilities (security, happiness, stress, vulnerability (Sen, 1984,1987 in Scoones, 1999)
- ❑ Livelihood adaptation, vulnerability and resilience (ability of livelihoods to cope with and recover from stresses and shocks)
- ❑ Natural resource base sustainability (the ability of a system to maintain productivity when subjected to disturbing forces)

(Scoones, 1999)

The ability to create or change livelihoods depends on the household's available pool of resources.

Livelihood resources can be divided into four types of capital:

- ❑ Natural capital (soil, water, etc.)
- ❑ Economic capital (cash, credit, savings, production equipment, etc.)
- ❑ Human capital (skills, good health, education, ability to labour, etc.)
- ❑ Social capital (networks, social claims, associations, etc.)

(Scoones, 1999)

In examining the sustainability of livelihoods, the connections between the complex and dynamic livelihood processes must be resolved. This necessitates the investigation of combinations of different strategies (agricultural intensification/extensification, livelihood diversification and migration), and of the institutions present, since institutional processes create restrictions or opportunities to sustainable livelihoods; formal and informal institutions mediate access to resources and effect the composition of livelihood strategies. Hence, analysis of strategy combinations, clustering of capital and institutions is a key part of this investigation (Scoones, 1999).

After this brief introduction to the scope of this fieldwork and the theoretical ground on which we will operate, we will turn to a more contextual introduction of the location in which we spent 10 marvelous days. We start of with a general introduction to the Malaysian context, and progressively tune in the focus to our village, Kpg. Sebandi.

2 Introduction to Malaysia and study area

Malaysia consists of two major parts, Peninsular Malaysia, which includes 11 separate states, and a part of the island of Borneo, on which the two states of Sabah and Sarawak are situated. Malaysia has a total population of 23 million people of which approximately 20% live in Borneo (Danced, 2001).

Figure 1. Map showing Malaysia (Wuarchive, 2003). – Too big! Could not be included in soft copy!

In terms of area, Sarawak is the largest State in the Federation of Malaysia with an area of approximately 124,400 km², which accounts for about 37.5% of the total area of Malaysia. However, in terms of population, about 2.2 million people live here or less than 10 percent of the total Malaysian population (Sarawak Tourism Centre, 2003).

2.1 Federal strategies and policies

The federal Malaysian government has since the 1970s had an overall goal to reduce poverty and income gaps between ethnic groups. As a result of these ambitions, Malaysia has experienced rapid economic growth and has reached “Newly Industrialized Economy” (NIE) status (Airriess, 2000), which puts it in the World Bank’s upper-middle-income group of developing countries (Barraclough & Ghimire, 2001).

The federal strategy, Vision 2020 which was stated in 1991, seeks to redefine Malaysia as a nation with a homogenous, yet multi religious and ethnic population, as well as it seeks to create a higher degree of democratization, industrialization and more efficient agricultural production (Institute of Strategic and International Studies, 2003).

Under the above mentioned national strategies and policies the New Agricultural Policy 3 (NAP3, 1998-2010) is directly focused at sustainable rural development and food security as well as promoting cash-crop production (Ministry of Agriculture, 1999). A commercial approach (as opposed to the former subsistence/subsidy-based approach) will be adopted for the development of

the smallholder sector. With this approach, small, fragmented farm holdings, especially those on Native Customary Lands (NCR-land)¹, should be consolidated into viable nucleus/mini estates (Sarawak State Government, 2003).

2.2 Sarawak - Rural development; institutions and schemes

In spite of the general economic progress in Malaysia, the large income gaps between regions and between rural and urban areas have not been eradicated; persistent rural poverty still exists (Hafner, 2000). The federal government as well as the state-government of Sarawak has implemented a number of programs in order to reduce poverty among small-scale farmers through the introduction of cash-crop farming. These programs predominantly operate on NCR-land.

According to the state government, 32.4% of Sarawak's total land area is suitable for large-scale agricultural production. However, only 8.7% of this area is planted with high productive crops, while the rest is still under shifting cultivation for hill paddy (estimated at more than 1.6 million ha) (Sarawak State Government, 2003).

As a way of eliminating rural-urban and ethnic income gaps, the state government in 1997 launched the *New Concept* strategy (Ministry of Land Development, Sarawak, 1997). By this the state government encourages the development of large scale plantations and agricultural schemes, using private capital to develop idle or under-utilized land, especially NCR-lands. By transforming these vast tracts of lands into profitable plantations, the government aims at increasing the income and general standard of living for the rural land-owners, through a gradually reduction of areas utilized for extensive shifting cultivation.

2.3 Kpg. Sebandi (Study area)

Native inhabitants of Borneo, commonly referred to as 'Dayaks', consist of a wide range of indigenous groupings, each with their own culture and language. The term Dayak is normally

¹ The NCR-land is one of five categories or land codes of state land. These are; Mixed zone land (no restrictions on who can claim/purchase land entitlements), Native area land (natives can claim land entitlements), Native customary land (land held under no title, but natives have customary rights if they have been settled on the land earlier than 1958), Reserved land, and Interior area land (government lands reserved for forest) (Cramb & Wills, 1990).

designated to groups who are non-Muslim and non-Malay, such as the Iban, which mix traditional customs with Christianity. The Iban constitute the largest population group in the state of Sarawak, and are considered settled agriculturalists, who mostly live in longhouse communities (King, 1993).

The study area of this project is the Iban village Kpg. Sebandi, which is situated in the Lundu District, Kuching Division, Sarawak.

The founders of the community were resettled in this area in 1955. A drainage system was established by Drainage and Irrigation Department (DID) in the period 1955-58. The village was split up into the two villages Sebandi Hilir and Sebandi Ulu. The idea of this was to be able to claim more land, and for the people in the two villages to have somewhere to visit during festivals.

The two villages have a total of 79 households, 34 in Sebandi Hilir and 45 in Sebandi Ulu. They are connected to the main road between Kuching and Lundu by a gravel road, about 7 km long. The villages have electricity. For drinking water, Hilir depends on rainwater and Ulu pipe water, and in dry seasons water supplies from the Public Work Department, because the river water is not drinkable. Among the infrastructures available to the villagers are a community hall and a primary school.

In the years 1986-1987, DID implemented a 'controlled drainage' scheme covering about 81-88 Ha in the Sebandi Hilir area (Block A) and in 1993-1994 a 'diversion irrigation' scheme in the Sebandi Ulu area covering about 50 Ha (Block C).

In July 2000 the villagers entered a contract with a company from Kuching to farm their land on a joint venture basis, meaning that the villagers leased part of their land to the company for a period of 20 years and in turn would receive 10% of the total paddy² yield for every harvest. 61 landowners signed the contract.

² Paddy is the non-sorted product, the amount of clean rice will be less.

3 Methodology

The scope of this study, given the objectives of the research and the framework chosen, was fundamentally interdisciplinary. Methods from different disciplines were used in order to obtain the diverse kind of data, which were needed for answering our objectives. This interdisciplinary approach also gives the research greater validity, since it made triangulation possible (Mikkelsen, 1995).

The methods have been chosen according to the 'sustainable livelihood framework', which has guided us in selecting the relevant data needed under the limitations of the short duration of the field study. For an illustration of how our choices of indicators and methods are linked to the framework, see Figure 2.

3.1 Questionnaires

50 questionnaires were conducted, in order to get an overall quantitative view on the villagers' family structure, income, land use, farming practices, and their perceptions of different issues such as e.g. work, health, infrastructure, and the involvement with the JVC (see questionnaire in Appendix A). 22 were conducted in Hilir and 28 in Ulu to cover an equal fraction of households in the two villages. Households were selected randomly within each village from their numbering. The proportion (63,3%) of interviewed households was considered sufficient to be representative for the villages.

The respondent was in most instances the head of household. The setting of the interview was the respondent's home.

Most of our questions were formulated in a concrete and direct way, involving phrasings starting with: who, why, what, where, when and how, (which is recommended by Mikkelsen (1995)) and did not seem to cause misunderstandings. Most of them were closed or demanded a concrete answer, only a few open-ended questions were included. However, the part on perceptions of the JVC sometimes seemed to cause confusion because these questions were less concrete and harder to relate to.

Key elements	Data needed (Indicators)	Methods
Creation of livelihood	<i>Job situation of villagers.</i> <i>Income levels of households.</i> <i>Land use.</i> <i>Subsistence production.</i> <i>Involvement in JVC.</i> <i>Age-distribution in relation to ability to work.</i> <i>Perceptions of working situation.</i> <i>Migration patterns.</i>	<i>Questionnaires</i> (job, income, production, farming practices and problems, perception of job situation, migration, JVC, age distribution). <i>Focus groups</i> (men: yearly activity calendar, women: daily activities, youth: job ranking). Interviews with key informants (DOA: farming, production. Headman: JVC, farming, yields).
Poverty reduction	<i>Income levels.</i> <i>Income-generating strategies.</i> <i>Consumption/commodity prices.</i> <i>Information on welfare system.</i> <i>Information on the village's strategies towards its poor.</i>	<i>Questionnaires</i> (income levels, sources of income). <i>Interview with key informants</i> (headman and counsellor, head of sub committee of welfare in the village).
Well-being and capabilities	<i>Education level.</i> <i>Health.</i> <i>Perception of job situation.</i> <i>Perception of level of influence, possibilities and real choices regarding agricultural development and the JVC-scheme.</i> <i>Perceptions of values.</i> <i>Future expectations and wishes.</i> <i>Land rights (entitlement).</i> <i>Government policies.</i> <i>Institutions.</i>	<i>Questionnaires</i> (education level, health care, job, JVC, status of land). <i>Focus groups</i> (value ranking). <i>Interview with key informant</i> (Counsellor: village structure of Ulu. Secretary of committee: village structure of Hilir. Headman: entitlements of land. Representative from Lundu District Council: land rights. Supervisor at JVC). <i>Review of government and state policies.</i>
Livelihood adaptation, vulnerability and resilience	<i>Diversification of livelihood strategies/activities.</i> <i>Long-term/short-term strategies (agricultural and economic strategies).</i> <i>Regular/non-regular job situation.</i> <i>Diversification of crops.</i> <i>Fluctuating crop prices.</i> <i>Disturbing forces in subsistence farming.</i> <i>Status of land.</i> <i>Migration patterns.</i>	<i>Questionnaires</i> (livelihood activities, farming activities, job situation, migration, pension/savings/investments, pest problems) <i>Interviews with key informants</i> (Representative from Lundu District Council: land rights. Headman: entitlements of land. Counsellor: Cash-crop prices) <i>Pest surveys</i> (birds, insects, weeds)
Natural resource base sustainability	<i>Land use.</i> <i>Disturbing forces in farming.</i> <i>Water quality.</i>	<i>Questionnaires</i> (land use, pests, use of agrochemicals) <i>Mapping of land use</i> <i>Water sampling</i> <i>Pest surveys</i> <i>Men's focus group</i> (pest ranking, working calendar).

Figure 2. Linkage between framework, data and methods.

3.2 Interviews with key informants

Qualitative interviews with several key informants were conducted. The aim was to provide us with background information about the village and specific details and in-depth understanding of issues

found to be of particular importance. As key informants, persons were chosen who had a certain position within or related to the village.

Topic-focused interviews (Casley & Kumar, 1988) were conducted with the following key informants:

- Headman of Sebandi Hilir.
- Temporary headman of Sebandi Ulu (also involved in the District Council, therefore referred to as *counsellor*).
- Head of sub-committee of welfare in Sebandi Ulu.
- Secretary of committee in Hilir.
- Local supervisor of the JVC-scheme.
- Local official for DID in Sebandi.
- District official for DID in Lundu.

Semi structured interviews (Casley & Kumar, 1988) were conducted with the following key informants:

- District Agricultural Officer of Lundu District.
- Representative of the District Council in Lundu.

In addition, informal conversation with villagers was carried out during the entire fieldwork. This was possible due to the very friendly and open-hearted atmosphere in the village.

3.3 Focus groups

The primary objective for conducting the focus groups was to obtain information on specific issues not covered by the questionnaires, and to allow intergenerational and gender differences on these issues to be expressed.

3.3.1 Men's focus group

The prime objective was to gather information about farming practices and pest problems in the villages, and to obtain information about the men's perceptions of life in general. This was done by

(i) the elaboration of a yearly working calendar of agricultural practices, (ii) a pair wise ranking of pests to estimate their relative importance as constraints to income generation in farming, (iii) a discussion of factors considered important for a good life, followed by a pair wise ranking and (iv) some open questions to the group about farming practices. One student conducted the session with the help of the counsellor from Sebandi Ulu to interpret.

Due to a confusing invitation strategy, the group size became too large (21 farmers) and was therefore not optimal. Probably, half the number of individuals would have been more suitable for active discussions. In our case both headmen were present and it was quite clear that the 4-5 heads of the assembly did most of the discussion. In this way, the discussion was monopolized and had in-built breaks for open discussion (Mikkelsen, 1995). Furthermore, involving a villager as interpreter, in this case a person with high status, meant that he had a tendency to answer on behalf of the group.

3.3.2 Women's focus group

The purpose was to obtain information about what the women valued as important, and to get a picture of their tasks and activities. This was done by (i) a discussion of factors or values important for a good life followed by a pair wise ranking, and (ii) a description of daily activities during the week. Two students and one interpreter conducted the session.

The number of women in the group (24) was also much higher than planned, but it was possible to split the women in smaller groups, because two students conducted the session. A local woman helped us interpret in one of the groups, which implies that our questions may have been interpreted differently by her (see also men's focus group). Open ended and personal questions had been prepared, but considering the group size, we did not find it appropriate to start these discussions. We thereby missed some of the intimacy and possibilities of going beyond the immediate answers.

3.3.3 Youth focus group

The objective was to capture young people's thoughts of a good life, their opportunities and expectations for the future, and of their own culture. This included (i) a discussion and ranking of values as done both with the men and women, (ii) a pair wise ranking of different job opportunities, and (iii) open questions on their perceptions of their own culture as Iban, the western culture, and

other issues like education and travel patterns. Three students and one interpreter conducted the session.

Among the six young people (16-20 years) present were both people waiting for their grades wanting to continue studying at a higher level, and people who had left school. The discussions provided an insight in to the young peoples thoughts and expectations, which we did not obtain from any other methods.

3.3.4 Summarising discussion of focus groups

The three focus sessions provided us with a vast amount of information, and in this way, they were very economic in terms of spent manpower. However, the use of this method also clearly revealed both the weaknesses of this method in general as well as it exposed our inexperience as conductors of this kind of sessions. The need for communicating through an interpreter means that part of the insights to the group dynamics is lost, and a good interpreter is therefore of particular importance in this kind of sessions.

The pair wise ranking of different issues provided us with valuable information, but the method can also be questioned. In general, the subjects, whom the respondents were comparing, should be able to substitute each other completely. This was not the case for all values.

The sessions were conducted at the end of our fieldwork, and perhaps some of the leads discovered could have deserved further in depth attention afterwards. It might therefore have been more appropriate to have these sessions earlier in the fieldwork period.

3.4 Bio-physical methods

Bird, insect, and weed sampling were employed to assess and verify the supposed presence of pest species affecting rice – water testing was carried out to evaluate the suitability of the environment to wet-rice rice farming and possible impacts of this. The chief limitation in sampling the biotic and abiotic environment involved the temporal variability of conditions within the rice fields and surrounding areas. The presence of migratory fauna, seasonal weed species and seasonal

applications of agrochemicals, which alter soil and water chemistry are some of such factors which could not be addressed due to the duration of the study.

3.4.1 Birds

To determine the distribution of bird species present, mist-nets of an approximate 3cm mesh size were erected along adjacent sides of a wet-rice field in the morning, and were taken down at sunset. Checks were carried out every two hours. Captured birds were classified and released (or given to the villagers). One field was sampled for five days in Sebandi Hilir, and one field for four days in Sebandi Ulu.

During our sampling, nets were set up 2 – 3 hours after dawn; ideally they should have been set up before dawn as to obtain a more representative sample of birds. Further, an observational approach examining how the birds affect rice crops, i.e. eating seeds, shoots, etc., could have been used.

3.4.2 Insects

Insects were collected in wet-rice fields manually with butterfly nets and hands. Samples were taken both at the canopy and surrounding the roots and stems, and in a variety of areas in the field. Specimens were caught, anaesthetized and classified. Insect sampling was done daily between the hours of dawn and dusk.

Human error in the sampling of insects affected our results the most, the sheer small size of some insects made their collection difficult. A more appropriate methodology would involve setting up light traps, but lack of power supply made this impossible.

3.4.3 Weeds

A weed survey was done in four wet-rice fields, two in Sebandi Ulu and two in Sebandi Hilir. Twenty-five meter transects were taken from the midpoint of the edge of each field towards the centre, with 1m² sample plots taken every 5 meters. In each plot, the number of rice plants was noted, and the fraction of exposed soil was estimated (see Figure 3). The three most abundant weed

species in the plot were noted and their total fraction of groundcover estimated in the same way as for exposed soil.

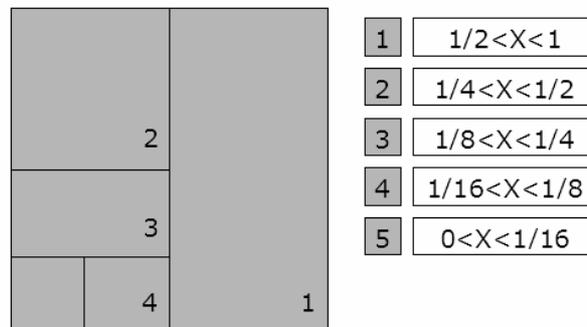


Figure 3. Weed ranking methodology.

An alternate method would have been to use the same sampling methodology, but estimate biomass instead of ground cover.

3.4.4 Water

Water samples, of two replicates, were collected at: the inlet point of river water to the rice scheme (A) (see Figure 4), the rice field outlet (B), the village's wastewater discharge (C), and the total discharge returning into the river (D). Dissolved oxygen, temperature, conductivity, pH, total dissolved solids and salinity were analyzed and recorded on site; while nitrates, ammonia, and phosphates were tested at a provisional laboratory. Furthermore, an analysis for pesticide residues was planned to be carried out later at UNIMAS, but due to wrong storing of the samples this could not be performed.

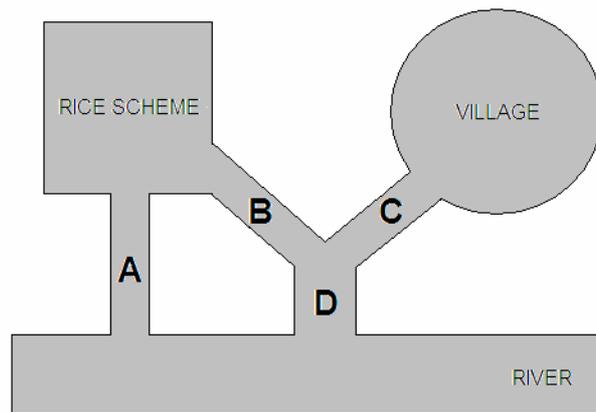


Figure 4. Water sampling sites.

3.4.5 Water fauna

A small water fauna survey was carried out using invertebrate indicator species to assess the quality of the water in the irrigation canals in Sebandi. Samples were taken at three sites within the irrigation system: 1) canal running along the JVC rice scheme area, 2) canal running along private rice plots between Sebandi Hilir and Ulu, and 3) canal running along private rice plots south of Sebandi Ulu. The water depths were approximately 0,5-1 m. Nets with a mesh size of about 4 mm were used for scooping animals from the water. Animals caught were counted and identified to taxonomic groups by use of a simple key developed for freshwater invertebrates of ponds and streams in Thailand (Kanjavanit & Tilling). By assigning different 'pollution scores' to different groups of animals, a water quality index could be calculated for each site.

Some factors limit the outcome of this study. The method and the guide were developed for streams and rivers with running water, however the water in the irrigation canals was moving very slowly. This could affect which kinds of animals were found. It is also not from the indicators possible to determine if the polluting agents were fertilizers or pesticides.

In addition to the invertebrate study, at sites 1 and 3 efforts were also made to investigate the presence of fish by using a cast net. The fish were identified to species.

The limited scope of the bio-physical study, both spatially and temporally, greatly affected the reliability of the biophysical results. A brief study meant we were able to only sample small areas, and over only a short period of days. Ideally, a research of pest problems should have investigated the correlation between presence of pests and their impacts on yield. Soil analyses were due to the time limitations not done, since obtainable results would have been too limited to draw any significant conclusions.

4 Results and analysis

The results have been analysed under the assumption that the villages of Sebandi Hilir and Sebandi Ulu can be regarded as one village, and therefore that no essential differences of the livelihoods between the two villages exist. This is based on the fact, that the villages share a common history as one village, and therefore are closely tied together. Even though each village has its own institutions (committees and sub-committees), it was furthermore our impression that there was a wide corporation and consensus between the villages.

4.1 Land use

Rice was grown by nearly all households in the village (94%) and was used only for subsistence. Wet rice was by far the most common type of rice grown due to the suitability of the area (flat peat land and swamp areas), but about a third of the households grew hill rice in shifting cultivation systems as they had traditionally done before being resettled (Table 1). Many of the farmers also had cash-crops, either rubber or pepper. Rubber was not being tapped at the moment due to low market prices. Pepper, therefore, was the only major cash income generating crop in farming. A few farmers had fruit trees, cocoa or vegetables, which in some cases provided additional cash income. Most households had one or a few acres of land in the JVC wet rice scheme; and a few households also leased out some of their land to an oil palm plantation, from which there was no return either.

Table 1. Crops cultivated in the village.

	Percentage of farmers growing the respective crops	Mean plot size (acres) *	Range of plot size (acres) *
Wet rice	88%	1,5	0,5 – 10,0
Hill rice	34%	1,5	0,5 – 4,0
Pepper	64%	232	30 - 500
Rubber	74%	3,4	1,0 – 15,0
Fruit trees	14%	2,1	2,0 – 3,0
Cocoa	8%	1,6	1,0 – 2,5
Oil palm (scheme)	9%	8,7	1,0 – 40,0
Wet rice in JVC-scheme	82%	2,4	1,0 – 6,0

*For pepper, acres are replaced by number of vines.

The farmers' wet rice was cultivated in a more or less traditional way not involving any sort of machineries. Rice was sown, planted, harvested etc. according to the seasons (see the working

calendar, Appendix B), allowing for one crop to be grown per year. The soil would therefore be 'fallowed' from about April to September. Some farmers would leave their wet rice field fallowed every second year. Farmers used agrochemicals on their fields to the extent it was provided by the farmers' organisation or they could afford to buy extra.

Pepper, as a perennial crop, did not imply seasonal working practices (see Appendix B). Use of agrochemicals, especially pesticides, was quite intensive (spraying done every 10 days).

4.2 Demography

The demography in the village showed signs of migration as an important factor. Most households had members who migrated. More than one quarter of the people, who had relations to the village, had moved away permanently.

For the villagers, who were permanently migrating there were differences in accordance to gender and age. The men were generally most migratory (60% of migrants) and their reasons for migrating were mostly getting jobs as labourer; whereas the women (40% of migrants), mostly migrated due to marriage, or for younger women to get jobs in coffee shops or in factories.

The pattern for the circular migration was slightly more gender biased. 65% of the men migrated and primarily for labour jobs. The women normally stayed within the villages to do the chores at home, such as farming and housekeeping. Students went to secondary boarding school and lived there during the week, the age group 20-40 years migrated mainly for labour jobs (see Figure 5).

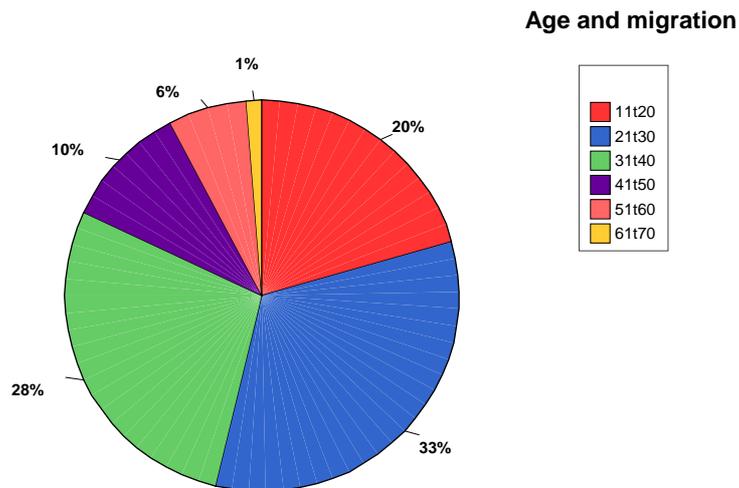


Figure 5. Migration and age.

The main occupation in the village was farming (32,3% of villagers, see Table 2), and there were only few other opportunities for jobs within the village. A job as labourer was the most important non-farm job, but occupation in these types of jobs were mainly found outside the village in plantations or in urban areas nearby. Due to the distance, some of the people working non-farm only came back once a month; others had gone abroad to Singapore or Solomon islands and only returned very seldom.

Table 2. Main occupation for all household members included in the survey.

Occupation	For villagers permanently living in village, 232 persons.	For relatives permanently living out of village, 78 persons.
	Percent	Percent
Farmer	32,3	1,3
Fisherman	1,7	0
Housewife	12,5	12,8
Odd job labourer	0,4	3,8
Daily labourer	1,7	11,5
Labourer on a regular basis	4,3	42,3
Gardener	0,4	0
Driver	2,6	3,8
Student	25,0	3,8
Supervisor	2,6	5,1
Army	0,4	2,6
Teacher	0,4	0
Unemployed	6,5	3,8
Occupation not stated	9,1	9,0
Total	100,0	100,0

The women, who are described as housewife living in village in Table 2 and 3, were besides their daily tasks doing handy craft. Most of the respondents, who were permanently living within the village and had a non-farm job often had farming as second occupation.

When looking at the adult population, almost half of them were farmers, and the largest proportion of the young people were students, and only 2% were house wives.

Table 3. Main occupation, by age group

Occupation	For adults older than 20 years, 153 persons	For young people younger than 20 years, 94 persons
	Percent	Percent
Farmer	48,4	1,1
Fisherman	2,6	0,0
Housewife	17,6	2,1
Odd job labourer	0,7	0,0
Daily labourer	2,6	2,1
Labourer on a regular basis	5,2	11,7
Gardener	0,7	0,0
Driver	3,9	0,0
Student	1,3	61,7
Supervisor	3,9	0,0
Army	0,7	0,0
Teacher	0,0	1,1
Unemployed	5,9	9,6
Occupation not stated	6,5	10,6
Total	100,0	100,0

4.3 Income

Cash income was divided into farm income and non-farm income. Farm income was mainly from pepper cultivation and non-farm income was all other kinds of income, including contributions from relatives, who had out-migrated. Besides cash income, there was subsistence production, which had a great importance when looking at the total income. All the wet-rice grown by the villagers were for self-consumption. Most farmers were satisfied with their size of land, but some stated, that they did not have enough rice to last the year.

The official poverty level in Sarawak is for a family of 4,8 persons 584,- RM a month. Half of this defines the hard core poor level (Nair, 2000). In the village 32% of the households were above the official poverty level, 26% were below, but above the hard core poor poverty level. 42% had income below the hard core poverty level.

Table 4 shows key parameters for the households at different poverty levels. The most obvious differences are that the size of land holding decline, and the borrowing of land from relatives increases with increasing poverty. Areas for wet rice cultivation, as pure subsistence crop, increase with increasing poverty. There are also differences in regards to long term investments, saving and pension.

Table 4. Selected topics related to poverty levels (all numbers are calculated on the basis of the number of respondents who held the certain “asset”).

	Above poverty level (16 households)	Below poverty level (13 households)	Below hard core poverty level (21 households)
Have income from non-farming	81%	69%	71%
Monthly estimated income from non-farming: Mean and range	Mean: 775RM Range: 30RM–2300RM	Mean: 283RM Range: 15RM-800RM	Mean: 134RM Range: 25RM-300RM
Grow pepper	94%	62%	23%
Number of vines: Mean and range	Mean: 227 Range: 50-450	Mean: 275 Range: 100-500	Mean: 204 Range: 30-400
Grow hill rice	44%	33%	29%
Number of acres: Mean and range	Mean: 1.6 acre Range: 0,5-4,0 acres	Mean: 1,1 acre Range: 0,5-2,0 acre	Mean: 1,7 acre Range: 1,0-3,0 acre
Grow wet rice	88%	85%	86%
Number of acres: Mean and range	Mean: 1,7 acre Range: 0,5-4,0 acre	Mean: 2,0 acre Range: 1,0-3,0 acre	Mean: 3,4 acre Range: 1,0-10,0 acre
Total area of NCR-land: Mean and range	Mean: 14,1 acre Range: 1,0-46,0 acre	Mean: 9,2 acre Range: 2,0-18,5 acre	Mean: 6,5 acre Range: 0-19 acre
Have borrowed land	75%	38%	48%
Have pension	100%	8%	0%
Have savings	100%	15%	0%
Have investments	100%	8%	5%

Only six households received formal welfare (60–110 RM). Informal welfare was widespread throughout the community in form of help for farming, food, building and maintaining property and borrowing of land. Help for applying for formal welfare, going to hospital etc. was also provided by the two headmen in the community.

4.4 Education

More than 60% of the respondents and their family members had no schooling or only primary education and another 20% had not finished secondary education.

People, who had never attended school, were mostly the oldest generation (see Table 5), but in general the level of education was low for all generations. Only 2 people had achieved more than secondary education. Most young people were either attending primary or secondary school.

Table 5. Educational level

Educational level	Adults, more than 20 years, 153 persons	Youth, younger than 20 years, 94 persons
	Percent	Percent
Never attended school	44,4	2,1
Did not finish primary	10,5	0
Attending primary	0	28,7
Primary education	28,8	6,4
Did not finish secondary	12,4	14,9
Attending secondary	0	30,9
Secondary education	2,6	6,4
Attending University	1,3	0
Not stated educational level	0	10,6
Total	100	100,0

The general opinion was, that education was very important and the only way to get a decent future. At the same time the older generation often neither had the economical means (expenses for education estimated at more than 200 RM a year; books, uniforms, transportation etc.) nor the experience or knowledge, to encourage the younger generation to get an education. As such the youth was lacking “role models” for education in the community, and basic knowledge on the possibilities in the education system after secondary school.

4.5 JVC structure and the villagers’ perceptions of the JVC

The JVC is a cooperation between a local company (Simunjan Enterprise Sdn. Bhd.), a Taiwanese company, and landowners from Sebandi, who have given over their land use rights to the JVC. The lease is contracted until the year 2020. The JVC has now developed 30% of the leased area of 116,5 acres, and are supposed to crop three cycles of wet rice a year, but so far only 2 cycles are cropped a year.

The JVC did not have as central a role in the land use in the village, as we thought prior to the fieldtrip, but it had some negative implications for the community. Some farmers claimed that they leased out the best land and now were left with the land that was furthest away. Some farmers stated that now they did not have enough land to support their own needs.

According to the villagers they had been promised jobs and a set wage of 20 RM a day, but this has not happened. Only two villagers had been employed, and only at 15 RM a day. The company had also promised to train the farmers and supply inputs, so that the community could get rid of pest problems in their own fields. This had not happened. The villagers' biggest regret was the return for leasing out the land. According to the farmers they were orally promised to get 1/3 of the yield in paddy, or at least 140 kg of rice per lot, no matter what the profit would be for the private company. Thus, participating seemed very attractive. These oral agreements are however not included in the written agreement between the parties (Appendix C). Here nothing is stated in regards to any claim for employment, the return is only set at 10% in paddy or half of this in rice or cash in the fixed proportion of 1,10 RM a kilo. So far they had only received about 65,- RM per person for 2,5 years (a collective amount of 4000 RM for the full period).

The respondents were told that the land would be returned to them with a title, something they now are beginning to doubt and of which there are no signs in the written agreement. The land title question was very important for most farmers (90%) as security for ownership.

84% of the villagers were involved with the JVC, and they on average contributed 2 acres pr. household. 50% were dissatisfied with the information they got prior to making the decision about joining the scheme.

As for the present involvement and future expectations 79% of the involved landowners were dissatisfied with their influence on the decision-makings in the running of the JVC, and 88% were dissatisfied with their share of profits. 81% were dissatisfied about the period they had leased out their land to the JVC, and 69% were dissatisfied with the arrangement concerning getting their land back in the future. In spite of these unsatisfied attitudes toward the JVC, we found that 70% of the respondents actually show interest in participating again in another scheme, provided that the government implemented it.

4.6 General perceptions

In general, there was contentment towards general infrastructure. Half of the respondents stated that it was easy to travel to nearby towns and 64% that public fare was cheap (return ticket to Lundu was 3-5RM). 86% thought that the electricity supply was adequate, even though many said it was

expensive (estimated monthly expense about 40 RM for a family of 6). Gas as substitute for electricity was cheaper, but still quite expensive (estimated monthly expense for gas about 20 RM for a family of 6). The biggest worry concerning infrastructure was the water supply. 84% said it should be improved, due to water shortage in dry season. Apart from these expenses, a family of 6 would spend at least 20 RM a month on food items. 82% of the respondents expressed satisfaction with the health care they received.

46% of the respondents thought that the youth was not interested in working on a farm. Also in the youth focus group, small scale subsistence farming was given low priority. Ranking different job options showed that an academic job was the top priority followed by a governmental job and teacher, all three jobs for which you need skills that reach beyond primary school. Then followed going abroad for a job and all kinds of semi-skilled jobs on a regular basis, least attractive jobs were subsistence farmer and casual labourer.

4.7 Focus groups

The different focus groups of men, women and youth all had slightly different views of what a satisfying life would consist of.

The male focus groups list was very concrete and consisted of (in the ranked order):

- | |
|---|
| <ol style="list-style-type: none">1. Education of children2. Money for medicine3. Land4. House5. Savings6. Car7. TV |
|---|

The women were slightly more abstract in their perception of a satisfying life as their ranking results shows:

- Group 1:
1. Education for children
 2. Good health
 3. Happy/easy life
 4. Better water supply
 5. Good road
 6. Money
 7. Better house
 8. Own business
 9. Enough paddy
 10. Car

- Group 2:
1. Money
 2. Education for children
 3. Enough paddy
 4. Good health
 5. Happy/easy life
 6. Better water supply
 7. Own business
 8. Good road
 9. Better house
 10. Car

- Group 3:
1. Good health
 2. Better house
 3. Education for children
 4. Happy/easy life
 5. Own business
 6. Better water supply
 7. Money
 8. Car
 9. Good road
 10. Enough paddy

Education of children and health seemed to be the two most important priorities for all the adult groups, while security in terms of property differed between the men and women. The women did not have land on their list, while men listed land, house and savings as a form of asset; the women listed them as a better house and money.

The youth focus group was very different from the two adult groups. Their components important for a good life included:

1. Getting their own family
2. Knowledge/education
3. Friends
4. Own house
5. Money
6. Information and communication technology
7. Travelling
8. Car/property
9. A job in the city

This difference in the components put forward by the youth focus group compared to the adult focus groups could partly be attributed to the general rising of the education level and the overall general development, and also seen as an expression of a phase in life, where assets and values for establishment of independent life is important. The same goes for travelling, which can be seen as

traditional for this age group in the community. They all thought there was a general lack of information technology and public libraries as means to improve their knowledge.

4.8 Pests

Both key informants and farmers saw pests as the biggest constraint to farming in the area. In the men's focus group bugs, rats and birds were ranked as the pests having the biggest impact on rice yields. Also in the survey these were, together with weeds, found to be major problems (Table 6). The severity of pest outbreaks could vary between years and fields. The farmers' only mean to control insect pests and fungi were to apply pesticides on their fields, which was done by more than half of the farmers. It was, however, only found to be effective in half of the cases. Rats were by most farmers controlled with poison, but also here only about half of the farmers felt that the method was effective. For birds, no good methods were found. Weeds were controlled quite efficiently using herbicides, or herbicides combined with manual weeding.

Table 6. Pest problems encountered in respondents' wet rice fields (45 respondents).

Pest type	No problem	Minor problem	Major problem
Birds	15,6%	11,1%	73,3%
Rats	17,8%	22,2%	60,0%
Grasshopper	53,3%	31,1%	15,6%
Other bugs	8,9%	11,1%	80,0%
Caterpillars	44,4%	35,6%	20,0%
Diseases	95,3%	2,3%	2,3%
Fungi	68,9%	11,1%	20,0%
Weeds	13,3%	6,7%	80,0%
Other pests (monkey, wild boar, deer)	71,1%	8,9%	20,0%

4.8.1 Birds

The bird family, Estrildidae, is regarded as one of the most problematic pest families to rice crops. The fact that it was found in our study area (Table 7) was an indicator of their potential major influence as a pest in the wet rice fields. The method by this verified the presence of bird pest species mentioned informally by various villagers, and through questionnaires and focus groups. According to the FAO (2003a), the most ubiquitous bird pests to rice belong to the genera *Lonchura* (Family Estrildidae), feeding on rice seeds.

Table 7. Bird species recorded

Family	Species
Estrildidae	<i>Lonchura spp.</i>
	<i>Lonchura malacca</i>
	<i>Lonchura leucogastra</i>
	<i>Motacilla flava similiana</i>
	<i>Coturnix chinensis</i>

4.8.2 Insects

A variety of insect pests were recorded (Table 8). Two of the species found could be classified as being ‘major pests’ (meaning that it is found in great number or abundance (FAO, 2003b)) using the FAO definition for rice insect pests in Malaysia (FAO, 2003a). These were *Sesamia inferens*, a root stem feeder, and *Cnaphalocrocis medinalis*, a foliage feeder.

Table 8. Insect species captured.

Family	Species
Acrididae	<i>Locusta migratoria maniles</i>
Alydidae	<i>Leptocorisa oratorius</i>
Pentatomidae	<i>Scotinophara coarctata</i>
Noctuidae	<i>Sesamia inferens</i>
Pyralidae	<i>Cnaphalocrocis medinalis</i>
	<i>Schirophaga intercalas</i>

4.8.3 Weeds

The weed survey identified a variety of undesirable plant species growing within the rice fields. Overall, 23 weed species were noted of which we were able to classify 16 (Table 9). Of these, 10 species were found to be most abundant in the plots. Total weed cover was on average 1/3 to 1/2 of the plot areas, whereas about 1/8 to 1/4 was exposed soil, the rest of the area being left for rice crops. There was however differences between fields and between small and large weed species.

Comparing the list of weeds found with a listing of herbicide-resistant weeds in Malaysia (Weedscience, 2003), we found only one herbicide-resistant weed, *Fimbristylis miliacea*, to be present within Sebandi.

Table 9. Weed species observed during survey.

Family	Species
Gleicheniaceae	<i>Dicranopteris linearis</i>
Labiatae	<i>Hyptis capitata</i>
Convolvaceae	<i>Ipomoea carnea</i>
Schizaeaceae	<i>Lygodium flexuosum</i>
Euphorbiaceae	<i>Phyllanthus niruri</i>
	<i>Manihot esculenta</i>
Rubiaceae	<i>Hedyotis corymbosa</i>
	<i>Borreria latifolia</i>
Poaceae	<i>Ischaemum magnum</i>
	<i>Sporobulus diander</i>
Asteraceae	<i>Ageratum conyzoides</i>
	<i>Emilia sonchifolia</i>
Cyperaceae	<i>Fimbristylis miliacea</i>
	<i>Fimbristylis globulosa</i>
	<i>Scleria sumatrensis</i>
	<i>Cyperus rotundus</i>

4.8.4 Water

Water sample data are summarized in Table 10. Using rice-water parameters set out by Ayers & Wescott (1985), salinity and total dissolved solids existed within the normal ranges, while the pH of all replicates was less than the recommended pH of 6.5 for rice crops, bordering on a moderate to severe problem in crop growth.

Table 10. Water sample data.

Site	A		B		C		D	
Replicate	1	2	1	2	1	2	1	2
DO (%)	69.9	70.4	34.0	26.0	121.8	127.8	83.30	81.10
Temperature (°C)	28.26	27.97	29.19	28.95	29.86	29.96	28.14	28.25
Conductivity	0.014	0.013	0.096	0.078	0.063	0.027	0.284	0.315
pH	5.40	5.30	4.06	4.27	5.19	5.19	4.60	4.48
TDS (mg/L)	0.0090	0.0086	0.0615	0.0501	0.0169	0.0140	0.0180	0.0020
Salinity (mmol/cm)	0	0	0.04	0.03	0	0	0	0
Nitrate (mg/L)	0.088	0.220	0.088	0.088	0.088	0.088	0.176	N/A
Ammonia (mg/L)	0.129	0.206	0.232	0.219	0.245	0.245	0.219	N/A
Phosphate (mg/L)	0.511	0.896	0.772	0.466	0.136	0.055	0.074	N/A

DO: dissolved oxygen; TDS: total dissolved solids

Keeping in mind, in samples with a pH out of range (6.5-8.4) but with low salinity (e.g., < 0.2 mmol/cm), there is likely no problem as the water has very low buffering (Ayers, R.S. & Wescott, 1985). However, additional checks should be pursued for possible nutrient imbalance.

Fertilizer use efficiency is the output of any crop per unit of fertilizer nutrient applied under a specific set of soil and climatic conditions (De Datta, 1981). The nitrate, ammonia, and phosphate

present in the water samples tested indicated that some nutrients had been lost and not utilized by plants; however, we lack the information on initial fertilizer inputs to correctly judge the efficiency of their use. It is worth noting, however, that nutrient levels were similar among all water samples, discounting the notion that only rice field discharge contained such nutrients.

An analysis for pesticide residues was unsuccessful. Moreover, laboratory analyses for chemical oxygen demand (COD) and biological oxygen demand (BOD) were unavailable due to equipment failure at the Lundu field station.

4.8.5 Water fauna

Only few different groups of invertebrates were found in the irrigation canals at site 1 and 2 (Table 11) and at site 3 no invertebrates were found. The Water Quality Index ranges from 0 (extremely dirty water) to 10 (very clean water). In this study, site 1 and 2 with index values around 5, thus both fall somewhere in the middle, indicating average to dirty water (score 3,0-4,9: dirty water; score 5,0-5,9: average). Site 3 was found in a peat land area, the water was almost black and probably too acidic for invertebrates to live in.

Table 11. Results from a water fauna survey.

Site 1		Site 2	
Animal groups present	Scores	Animal groups present	Scores
Dragonfly nymphs	6	Dragonfly nymphs	6
Damselfly nymphs	6	Damselfly nymphs	6
Water bugs	5	Water bugs	5
Segmented worms	1	Fry	(no score)
Tad pole	(no score)		
Fry (young fish)	(no score)		
Total score	18	Total score	17
Number of animal groups	4	Number of animal groups	3
Water Quality Index (Total score/ Number of animal groups)	4,5	Water Quality Index (Total score/ Number of animal groups)	5,66

Most fish caught (Table 12) were from families especially adapted to oxygen-poor water by having an accessory air-breathing organ and the ability to ‘walk’ and survive on land for some time (the Anabantidae, Channidae and Clariidae families) (Kottelat et al., 1993). This indicates low levels of oxygen in the water.

Table 12. Fish caught in irrigation canals.

Family	Species	Site
Anabantidae (climbing perches)	<i>Trichogaster trichopterus</i>	1 & 3
	<i>Anabas testudineus</i>	3
Channidae (snakeheads)	<i>Channa striata</i>	1
Clariidae (walking catfishes)	<i>Clarius teijsmanni</i>	1
Cyprinidae	<i>Rasbora einthoveni</i>	1

5 Discussion

The following discussion will be structured by the five key elements of the sustainable livelihood framework as they are stated in chapter one.

5.1 Creation of livelihood

At present the use of shifting cultivation in Kpg. Sebandi is minimal, and wet rice has to a large extent replaced hill rice for subsistence. According to Cramb (1993) there can be several reasons for abandoning shifting cultivation, i.e. population growth, out-migration and a general orientation towards cash-crop farming, but also the suitability of the specific area for different types of crops play a role.

In the village non-farm income has a great impact on the total household income, mainly from household members, who migrate for longer or shorter durations. According to Mertz et al. (1999) out-migration should be included when looking at population growth, as a determining factor for the size of the available labour force. In the village there were signs of this labour shortage, because younger people migrated for jobs in the non-farm sector.

The changing livelihoods in Kpg. Sebandi in regards to traditional Iban land use can be attributed to the greater integration of the village in the market economy. Many farmers recently started growing pepper or expanded their existing production. Further more, they ranked subsistence farming and having rice for own consumption as less desirable compared to getting a paid job. This shows an increasing orientation towards cash-crop production or non-farm employment.

Entering the contract with the JVC would for the villagers ideally provide security in terms of a stable income in a time, where subsistence production is not encouraged by the government and the young generation does not show interest in farming. However, this source of income has not been reliable so far. The state government has no part in the actual agreement between the two parties in the contract, which means that the villagers have no parts governing their interests, as opposed to JVC-arrangements under the Konsep Baru, where governmental agencies act as trustees (Ministry of Land Development, Sarawak, 1997).

The state government can, under the intention of general land development, put pressure on the local villagers, due to the lack of formal titles for NCR-lands. Thus the land owners, because of limited access to different forms capital, see themselves marginalized in the process. This is also the general picture when analysing the level of satisfaction with the JVC. The responses show that the villagers feel lured and exploited, and generally have lost faith in private investors as developers of their land. However, many farmers said that they would participate again in another scheme, provided that the government takes active part in land development. This also shows that the villagers are not against agricultural development of their land as such, although they have not yet benefited from the current arrangement with a private investor.

This undermines the impression of Iban as shifting cultivators. Instead it emphasises that they are willing to participate in rural development as a way of diversifying their activities and getting cash income, if they are potential beneficiaries. This fact also correlates, with our findings in the village, about the allocation of capital on different economic activities, as a way of potentially averting risks and maximising benefits in the household strategies.

We found that the recognition of being a small scale subsistence farmer in the village was very low amongst the young people, even though this was what most people did in the village. For the adult farmers and women it was also clear that what they found important were assets, which could not be obtained without cash income. The introduction of cash-crops like pepper has made it possible for farmers to fulfil some of these needs in terms of material assets, but for the younger people, it was clear that they wanted to do completely different with their life. This shows signs of an inter-generational deagrarianization.

5.2 Poverty reduction

Sarawak has been relatively successful in eradicating poverty, but still 7.5% is earning less than the poverty level and the majority of these are Iban (Berma, 2000). The cause of this inequality is according to Berma (2000) found in the way assets are distributed between ethnic groups in Sarawak, and the way the ethnic groups prioritise their different forms of capital and choice of livelihood strategies. Furthermore, the access to i.e. economic and natural capital for different ethnic groups is sometimes hindered by the implementation strategies for poverty eradication from the government. Only six families in Kpg. Sebandi are receiving welfare under the hard core poor

programme, even though 21 families are hard core poor according to the official numbers. Also, possibilities for obtaining loans for pepper cultivation from the farmers' organisation have not existed for the last three years.

Traditionally, poverty eradication is looked at as an economic problem; people do not make enough income. This is then acted upon by trying to generate income for the poor (economic capital), but the policies fail because they are not aimed at the causes of poverty, but the consequences. This was also the case in Kpg. Sebandi. The institutional setup in the JVC was only aimed at generating cash income, and not at actually involving the farmer in the running of the enterprise. The educational level was low, and no means were allocated at raising the adult educational level.

Poor, old and other people, who were not able to obtain a livelihood by their own means and did not get help from the government, had to rely on the help from other members in the society. Fortunately, Iban societies have a strong longhouse tradition of working together, borrowing land and helping each other. Social capital is therefore, if not equally distributed, then present for members of all levels in the society.

5.3 Wellbeing and capabilities

As described in section 4.4 the educational level in the adult group is generally very low in Kpg. Sebandi. This affects the villager's capabilities and possibilities for over viewing the consequences of their choices in regards to implementations of plans from institutions or private investors at higher levels or in regards to daily interaction with the "outside" world. Most villagers were dependant on a limited number of resourceful persons within the village, who for example, had to escort people to hospitals, apply for welfare and correspond with JVC and government. Another problem with the limited number of resourceful villagers was that the youth could only draw upon these few persons as role models and guides in decision making about future plans concerning education. Even these resourceful persons did not have any experience about the education system beyond secondary school. According to Berma (2000) family background plays a key role in the process of human capital accumulation, and Iban generally prefer to spend more on other things compared to education of children. According to our results the parents intensions were to give education to their children a high priority, but they were not able to, because of the high cost of education. The village youth also found it hard to seek information, because they did not have any

adults to ask for advice. Another aspect of this lack of qualified advisors was that the youth had no knowledge of special scholarships at the universities for Iban. The school was poorly equipped in terms of e.g. computer and library facilities, and therefore seeking information was extremely difficult for students, and therefore poses major obstacles for their further possibilities in the education system. In Kpg. Sebandi, there was a general satisfaction, with the provided health care, but many villagers expressed concern about any emergency situations, where they due to poor infrastructure would have to go to Lundu or Bau.

In regard to the villagers initial choice to join the scheme, most respondents answered that they had followed the leaders of the community. This was partly due to the hierarchical stratification of the society, but equally important, because they themselves lacked the skills to make those decisions and interact with the system beyond the village, which means that villagers with little human capital are dependent on social capital, mainly in terms of net works within the village.

Berma (2000) describes Iban as poor, because they lack opportunities for income generating assets due to structural constraints and lack of human capital in the form of formal education. A structural constraint is that education in primary and secondary school is only provided in Malay and English, and not in Iban. This problem of access to existing forms of capital is supported by Sen (1987) in Kabeer (1994), who defines people's capabilities as what people can do or be with their entitlements. In this way, the structure of the society is distributing the entitlements and can therefore exclude certain groups (Appadurai, 1984 in Kabeer, 1994). An example of an entitlement is land title. The villagers have formal rights to the NCR-land surrounding the village and have had a survey performed, but this has not given them legal ownership in terms of a deed. According to the District Council in Lundu, there is a risk that no land titles will be assigned to anyone in the nearest future, since it is not in the government's interest to give these deeds. As the representative from the Council said, the only way the rural areas can get developed is by the private sector and therefore NCR-land is needed.

The respondents, who were most optimistic about the future possibilities of the rice scheme, were people, who generally were most resourceful in human capital, but also in other forms of capital. This further supports the thesis of clustering of different form of capital (Scoones, 1999) in certain households.

5.4 Livelihood adaptation, vulnerability and resilience

As a way of adapting to changing internal and external circumstances, the villagers pursue combinations of the three types of broad livelihood strategies mentioned by Scoones (1999): agricultural intensification/extensification, migration and livelihood diversification.

As previously discussed, there are signs of agricultural intensification on a small scale in Kpg. Sebandi. This is primarily due to subsidised inputs, and training in the use of these, for wet rice production and pepper cultivation provided by the DOA. Rubber production was previously subsidised by the government and thereby the land use of small scale farmers reflects the state governmental policies. That the villagers have not reorganised their land portfolio, and replaced the rubber land with other cash-crops, can be seen as a buffer for fluctuating cash-crop prices or lack of labour.

Migration is one of the most important household strategies in Kpg Sebandi. It generates a change in the local rural areas away from traditional farming. Migration is also seen as one of the strategies that have the largest impact on the rural area, because it can cause an increased workload for the ones who stay behind, but can also have positive effect in terms of contributions from non-farm activities. There are different patterns of migration, and differences in who migrates (gender and generations) and therefore different implications or advantages for the individuals involved. Migration is not open to all, people's networks, the institutions, and social, cultural and traditional patterns are determining who migrates and when and where (McDowell and Haan, 1999).

The Iban of Sarawak are known to be mobile and have a tradition of circular out-migration, usually for the young men travelling to distant regions or abroad to earn money on non-farm activities and obtain the status of an adult ('Bejalai') (Soda, 2001). There is an increasing tendency for women also to migrate individually for jobs and education, as such migration is not necessarily gender biased anymore (Haan, 1999). For both sexes, as this study showed, these migration patterns are permanent, in contradiction to traditional migration, where men migrate for a limited period ('Bejalai'); this is in accordance with Soda (2001).

The field study also shows significant signs of circular migration, mainly by young people, who attend secondary school in nearby cities, and men who work in the non-farm sector, or in plantations. Circular migration maximises the total pool of capital available to the household. Young people are, as a long-term strategy acquiring human capital, whereas men are migrating for economic-financial capital, while people living permanently within the village maintain the subsistence base.

The permanent migration also contributes to the household economy with economical capital, but on a more irregular basis. Some migrants did not contribute, others contributed occasionally, and some contributed with large amounts on a regular basis, depending on their own situation. This according to Haan (1999) shows, that permanent migration can be divided into household or individual strategies. By individual strategies, we mean people pursuing personal interests, which are not according to the households needs.

As discussed, there is clear evidence of diversification in the households' pursuit of different forms of capital. But also within forms of capital, i.e. natural capital, the household are diversifying their activities. There are different time perspectives in the different strategies, and therefore also in the outcomes obtained. The villagers put their natural capital in different forms of investment; subsistence crop as buffer crops, cash-crops i.e. pepper, which carry higher risks due to dependence on price stability, but also holds potential of greater benefits in term of economical return, and involvement in JVC as a strategy for obtaining stable cash income. This in regards to natural capital shows, that the villagers have placed their investments in a diverse array of activities comprising their livelihood portfolio. This is further supported by the fact, that most household also complement their income from fishing, gathering and hunting.

In terms of economical capital, it is also evident, that the household, who have the means, prioritize investments and savings as a way of reducing vulnerability and enhancing resilience. We found that the general opinion was that a public job is very attractive, partly because of the pension and the job security.

5.5 Natural resource base sustainability

Studies from Asia have shown that in the long term, intensive rice monoculture systems lead to declining outputs (Pingali et al., 1997). This can be related to impacts on the resource base caused

by the system, such as (i) waterlogging (rice fields flooded without an adequate drying period) and build up of salinity; (ii) declining soil organic matter and nutrient depletion, leading to an increased need for inorganic fertilizers; (iii) build up of pests and diseases, leading to an increased use of pesticides (Jirström, 1996, Pingali et al., 1997).

It can be expected that some or all of these potential impacts will be seen arising from the cultivation strategies of the JVC rice scheme. It has, however, only been operating for two years and therefore impacts may not yet be visible. The farmers' cultivation methods clearly cause less harm on soil structure than the JVC system, which has levelled and compacted soils to prevent water from leaching through. Use of agrochemicals was suspected to pollute adjacent water bodies and eventually ground water (as seen in other places in Malaysia (Abdullah, 1995)). Water from the irrigation canals, both from the JVC-scheme and the farmers' fields, showed some signs of pollution and/or eutrophication. Also the river water was polluted; this might however stem at least partly from upstream sources.

According to the farmers, pests were the biggest problems in farming. Rice is found to be host for a wide multitude of pests due to its widespread distribution (Litsinger, 1993). Crop management practices that favour pests are in general monocultures (versus crop species rotation), annual crops (versus perennial), continuous planting, asynchronous planting, sole cropping (versus intercropping), large and/or aggregated fields, uniformity of varieties cultivated and injudicious pesticide use (Altieri, 1994, Jirström, 1996). These practices were all found in the intensive JVC rice scheme, while the farmers' rice fields were not continuously or asynchronously planted, fields were smaller and some places more scattered, and a number of rice varieties were used. It is therefore likely that introducing the intensive JVC-scheme could increase the overall pest burden of the village, as it was expressed by part of the villagers.

Traditionally, shifting cultivation has left the land to be fallowed for periods of years in order not to exhaust the soil. This, in combination with intercropping and crop rotation would serve as preconditions for pest control (Jirström, 1996). Thus, there is a risk that intensified, input-dependant farming systems may undermine the natural resource base in terms of decreasing soil fertility, decreasing water quality and increasing pest problems.

6 Conclusion

Kampung Sebandi shows signs of deagrarianization. This process is substantiated by the agricultural policies and general trends of economic development in the Malaysian society. As a way of adapting to these constraints and opportunities, the livelihoods of the village are changing. The trends which are being identified throughout southeast Asia, such as enhanced migration from rural areas, diversification of income generating activities and a closer integration of the rural villages in other sectors than farming, were also seen in Sebandi. Thus economic capital is gradually substituting natural capital as the most important form of capital for rural households. A gradual change in values and aspirations between the young generation and their parents will most probably lead to enhanced deagrarianization in the near future.

Whether the livelihoods in Sebandi can be regarded as viable is a matter of definition. The socio-economic aspects of the livelihoods are adapting to the changing conditions in the surrounding society, in terms of diversifying the generation of cash and subsistence income. However, a major part of the population is living below the poverty line and is therefore potentially vulnerable to disturbing forces such as fluctuations in cash-crop prices or severe pest attacks. The introduction of a commercial, intensified wet rice scheme has so far, instead of providing a stable income and rural development, further increased potential hazards to the villagers' subsistence production by occupying land which could have been used for subsistence farming, and by possibly in the long term increasing pest problems and undermining the natural resource base.

The Iban have an informal welfare system for supporting the poorest, and as such has capacity to buffer minor internal inequalities stemming from crop failure or other unfortunate circumstances. However, the society is relatively vulnerable to major disturbances due to a restricted common pool of resources.

The procedure in regards to the negotiations, implementation and running of the JVC has been far from optimal. This reveals that there is a strong need for governmental involvement in these kinds of arrangements to ensure the interest of the villagers, and that transparency and local active participation should be a must, if such schemes are to be viable and successful in the future.

Capabilities, in terms of educational level, need to be elevated in order for the villagers to advance in the general society of Sarawak and in the future be able to overview complex decisions, such as the terms for participating in agricultural development schemes, or obtaining secured employment in the non-farm sector. However, the strengths of Iban culture, traditions and informal institutions leave us with hope, that the society with its distinct way of life will be able to survive in the future rush of development.

7 Perspectives

As the case of Kpg. Sebandi shows, there are potential problems in leaving rural development solely to the private sector, since the private sector cannot be expected to act socially conscious.

Even though development projects under the New Concept have not all been successful, this field study shows that some sort of governmental involvement is needed in future arrangements. As such, the establishing of a three-party JVC seems more ideal, and the active involvement and encouragement by the paying of dividend to the landowners seems to be one aspect of ensuring 'local ownership' of the development project. Another is for the Iban to define the rural development themselves. The institutional construction, where a governmental agent acts as trustee for the interests of the landowners, seems to be one way of securing entitlements of the Iban.

Otherwise, it is doubtful if the cooperation will turn out to be a win-win arrangement for both the private companies and Iban landowners. Active participation of the villagers must be promoted, and possibilities for Iban to advance within the company should be possible. Possibilities for insights in the economy of the enterprise and a high general level of transparency in the decision-making and daily running must also be present. If not, the Iban will be left in the trail of rural development; misinformed, non-participating and distrusting towards private investors and agricultural projects.

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9 References

- Abdullah, A. R.** (1995), *Environmental pollution in Malaysia: trends and prospects*. Trends in analytical chemistry, vol. 14, no. 5: 191-198. Elsevier Science.
- Airriess, C.A.** (2000), *Malaysia and Brunei*, chapter 13 in *Southeast Asia. Diversity and Development*. Editors Leinbach, T.R. and Ulack, R. Prentice Hall, New Jersey.
- Altieri, M. A.** (1994), *Biodiversity and pest management in agroecosystems*. The Haworth Press, Inc., NY, USA. pp. 185.
- Ayers, R.S. & Wescott, D. W.** (1985), *Water Quality for Agriculture*. FAO Irrigation & Drainage Paper #om 29. Re, Italy
- Barraclough, S.L. & Ghimire, K.B.** (2001), *Agricultural Expansion and Tropical Deforestation*. Earthscan Publications Ltd, USA.
- Berma, M.** (2000), *Iban Poverty: A Reflection On Its Causes, Consequences And Policy Implications*. The Faculty of Economics, Universiti Kebangsaan Malaysia.
- Casley, D. J. and Kumar, K.** (1988), *The collection, Analysis and Use of Monitoring and Evaluation Data*. World Bank, Washington D.C.
- Cramb, R. A.** (1993), *Shifting cultivation and Sustainable Agriculture in East Malaysia: A longitudinal Case Study*. Agricultural systems 42. Elsevier Science Publishers Ltd. England.
- Cramb, R. A. & Wills, I. R.** (1990), *The Role of Traditional Institutions in Rural Development: Community-Based Land Tenure and Government Land Policy in Sarawak, Malaysia*. World Development, Vol. 18, No. 3: 347-360.
- Danced** (2001), *Malaysian-Danish Country Programme for Cooperation in Environment and Sustainable Development*. Danced/EPU 2001.
- De Datta, S.K.** (1981), *Principles & Practices of Rice Production*. John Wiley & Sons Inc. USA.
- Haan, A.** (1999), *Livelihoods and poverty: The role of migration – a critical review of the migration literature*. The Journal of Development studies Vol. 36: 1-47.
- Hafner, J.A.** (2000), *Perspectives on Agriculture and Rural Development, in Southeast Asia. Diversity and Development*. Editors Leinbach, T.R. and Ulack, R. Prentice Hall, New Jersey.
- Jirström, M.** (1996), *In the wake of the Green Revolution. Environmental and socio-economic consequences of intensive rice agriculture – The problems of weeds in Muda, Malaysia*. Meddelanden från Lunds Universitets Geografiska Institutioner, avhandlingar 127. Lunds University Press, Lund.

- Kabeer, N.** (1994), *Reversed realities: gender hierarchies in development thought*. Verso Publ., London. pp. 346.
- Kanjanavanit, O. & Tilling, S.** *A Guide to Freshwater Invertebrates of Ponds & Streams in Thailand. Adapted from the original key to British freshwater animals made by Orton, R., Bebbington, J. & Bebbington.* A. FSC Publications, Field Studies Council, Shrewsbury, UK.
- King, V.T.** (1993), *The Peoples of Borneo*, Blackwell, Oxford, UK.
- Kottelat, M., Kartikasari, S. N., Whitten, A. J. & Wirjoatmodjo, S.** (1993). *Freshwater fishes of Western Indonesia and Sulawesi*. Periphus Editions (HK) Ltd.
- Litsinger, J.A.** (1993), *A farming systems approach to insect pest management for upland and lowland rice farmers in tropical Asia*. In *Crop protection strategies for subsistence farmers*, edited by Altieri, M. G. Intermediate Technology Publications, London, UK. pp. 197.
- McDowell, C. & Haan, A.** (1997), *Migration and sustainable livelihoods: a critical review of the literature*. IDS Working Paper: 65. pp. 28.
- Mertz et al.** (1999), *Subsistence or cash: strategies for change in shifting cultivation*. Danish Journal of Geography, special issue, 1.
- Mikkelsen, B.** (1995), *Methodes for Development Work and Research A Guide for Practitioners*. Sage Publications New Delhi/Thousand Oaks/London.
- Ministry of Land Development, Sarawak** (1997), *Handbook on New Concept Development On Native Customary Rights (NCR) Land*.
- Nair, S.** (2001), *Poverty in Malaysia: A New Look At An Old Problem*. Department of Development Studies, University of Malaysia.
- Pingali, P. L.; Hossain, M. & Gerpacio, R.V.** (1997), *Asian Rice Bowls: The Returning Crisis?* CAB International, UK. pp. 341.
- Rigg, J.** (1998), *Rural-urban interactions, agriculture and wealth: a southeast Asian perspective*. Department of Geography, University of Durham, UK.
- Scoones, I.** (1999), *Sustainable Rural Livelihoods A Framework For Analysis*, IDS WORKING PAPER 72.
- Soda, R.** (2001), *Rural-Urban Migration of the Iban of Sarawak and Changes in Long-house Communities*. Geographical Review of Japan. Vol. 74 (Ser. B), No. 1: 92-112.
- Songan, P.** (2000), *Identifying the problems in the implementation of the new concept of native customary rights land development project in Sarawak through action research*. In *Borneo 2000. Environment, Conservation and Land*. Universiti Malaysia Sarawak, Kuching. pp. 251-261.

Web-adresses:

FAO (2003a),
<http://www.fao.org/inpho/compend/text/10a13.htm>

FAO (2003b),
<http://www.fao.org/inpho/compend/text/ch10-03.htm>

Institute of Strategic and International Studies (ISIS) (2003),
www.jaring.my/isis/mbc/2020.htm

Ministry of Agriculture (1999),
<http://agrolink.moa.my/dpn/dpn3/dpn/summary.html>
www.agrolink.moa.my/dnp/dnp3/dnp/new.html

Weedscience, (2003),
<http://www.weedscience.org/Summary/>

Wuarchive (2003),
<http://wuarchive.wustl.edu/~aminet/pix/map/Malaysia.jpg>

Sarawak State Government (2003),
http://www.sarawak.gov.my/sarawak_online/general/comm_agr.html

Sarawak Tourism Centre (2003), <http://www.sarawak-online.com/tourism/population.html>

APPENDIX A.

Kpg. Sebandi, Lundu, Sarawak.

Interview: Name of Kpg.: Sebandi Ulu/ Sebandi Hilier
Date: Time:
Household No: Interviewee: Head of household/Member of household

Respondent Profile

1. Ethnicity: a. Iban b. Bidayuh c. Others
2. Religion: a. Catholic b. Christian c. Others
3. Age:
4. Education level:
5. Main Occupation:
6. Second Occupation:
7. What is your income?

Family Profile

8. Fill in the table below:

Family Member	Gender	Age	Education level	Main Occupation	2 nd Occupation	Contribution to household	How much	Permanently living in this house
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								

Agriculture

9. Do you own land?
10. How much land do you own?
11. What is the status of this land?
12. So you lease land from others?

13. Do you cultivate the following crops? – if yes for what purpose (please tick response)

Crops	Yes/No	Et. Size (acres)	Own Consumption	For Sale	How much form sale?	Status of land
Hill rice						
Wet rice						
Yam						
Tobacco						
Rubber						
Cocoa						
Vegetables						
Fruits						
Pepper						
Others						

14. Do you have an irrigation system in your wet rice fields?

15. Do you have irrigation problems? a. yes b. no

Pests problems

16. Did you encounter any pest problems during wet rice farming?

a. yes b. no

17. If yes, what are the pests? (Please tick the appropriate answer(s))

(a) Birds

Local name	Effecting Level	Period/Stage	Cope Method	Effectiveness
	No problem	Early	Introduce predator	Yes
	Minor problem	Middle	Bird trap	No
	Major problem	Final	Scare-crow	
		Whole season	None	
			Others:	

(b) Rats

Local name	Effecting Level	Period/Stage	Cope Method	Effectiveness
	No problem	Early	Introduce predator	Yes
	Minor problem	Middle	Rat trap	No
	Major problem	Final	Rat harbourage	
		Whole season	Poison bait	
			None	
			Others	

(c) Grasshoppers

Local name	Effecting Level	Period/Stage	Cope Method	Effectiveness
	No problem	Early	Introduce predator	Yes
	Minor problem	Middle	Insecticide	No
	Major problem	Final	None	
		Whole season	Others	

(d) Bugs

Local name	Effecting Level	Period/Stage	Cope Method	Effectiveness
	No problem	Early	Introduce predator	Yes
	Minor problem	Middle	Insecticide	No
	Major problem	Final	None	
		Whole season	Others	

(e) Caterpillars

Local name	Effecting Level	Period/Stage	Cope Method	Effectiveness
	No problem	Early	Introduce predator	Yes
	Minor problem	Middle	Insecticide	No
	Major problem	Final	None	
		Whole season	Others	

(f) Rice diseases

Local name	Effecting Level	Period/Stage	Cope Method	Effectiveness
	No problem	Early	Bum	Yes
	Minor problem	Middle	Bury	No
	Major problem	Final	None	
		Whole season	Others	

(g) Rice Fungal

Local name	Effecting Level	Period/Stage	Cope Method	Effectiveness
	No problem	Early	Bum	Yes
	Minor problem	Middle	Bury	No
	Major problem	Final	None	
		Whole season	Others	

(h) Weeds

Local name	Effecting Level	Period/Stage	Cope Method	Effectiveness
	No problem	Early	Weeding	Yes
	Minor problem	Middle	Bum	No
	Major problem	Final	Bury	
		Whole season	Herbicide	
			None	
			Others	

(i) Other pest(s)

Local name	Effecting Level	Period/Stage	Cope Method	Effectiveness
	No problem	Early		Yes
	Minor problem	Middle		No
	Major problem	Final		
		Whole season		

Attitudes toward development

No.		YES	NO	UNCERTAIN	REMARKS
27.	Do you have enough land to support your family?				
28.	Are you interested in participating in any agricultural scheme implemented by the government?				
29.	Are you satisfied with your current working situation?				
30.	Do the youth in your family want to work on a farm?				
31.	Are transportation fares cheap here?				
32.	Is travelling to Lundu easy?				
33.	Is land title important?				
34.	Do your family get the health care they need?				
35.	Do you find electricity supply should be improved?				
36.	Do you find the water supply should be improved?				

37. Do you have a pension?

38. Do you have savings?

39. Do you have investments?

40. How has the wet rice JVC affected you?

41. Is education of young people important? Why?

42. GENERAL OBSERVATIONS.

APPENDIX B.

Farmers yearly working calender:

	Dry season	Wet season	Clearing	Sowing/Planting			Weeding			Pesticides			Fertilizers			Harvest			Festivals		
				HR	WR	PP	HR	WR	PP	HR	WR	PP	HR	WR	PP	HR	WR	PP			
Jan.																					
Feb.																					
Mar.																					
Apr.																					
May																					
Jun.																					
Jul.																					
Aug.																					
Sep.																					
Okt.																					
Nov.																					
Dec.																					

APPENDIX C.

Is a photocopy. Could therefore not be included in soft copy.

APPENDIX D.

Fieldwork calender

17.01.03

- arrival at Kpg. Sebandi
- welcome ceremony (all)
- walk in village and surroundings (Lise and Katrine)
- visit to Lundu to repair car (Andre, Adam, Roger, Nafisah)
- organise headquarter (all)
- tea at headmans house (all)
- discussion of questionnaires

18.01.03

- visiting rice field with farmer (Nafisah, Hoa, Adam, Katrine)
- putting up mistnets in ricefield (Nafisah, Hoa, Adam, Katrine)
- empty mistnets every two hours (Nafisah, Hoa, Adam, Katrine)
- catching insects (Nafisah)
- working on questionnaire (Lise, Andre)
- trying questionnaire (Lise, Richard, Katrine, Ole)
- walk to see rice scheme, spoke to the supervisor (Lise, Andre, Richard, Katrine, Ole)
- visit headman
- finishing questionnaire
- preparation of presentation in Lundu on Sunday (all)

19.01.03

- departure to Lundu (early morning)
- presentation of fieldwork objectives and methods in District Office in Lundu
- visit surroundings of Lundu (Beach!)
- visit headman to plan trip to hill rice field (Roger, Dominic)

20.01.03

- trip to headmans hill rice field (Richard, Andre, Lise, Philip, Roger, Dominic, Katrine)
- mistnets and insects (Nafisah, Hoa, Adam)
- questionnaires Hilir (Lise and Philip, Andre and Richard)
- interview with counsellor (Dominic, Roger)
- land-use mapping by villager Mr. Wilson Benang (Katrine, Kelvin)

21.01.03

- questionnaires Hilir (Lise and Philip, Andre and Richard)
- mistnets and insects (Nafisah, Hoa, Adam)
- drive to verify map (Dominic, Roger, Katrine)
- sampling of weeds (Katrine and Adam)
- data entered in SPSS (Hoa, Roger)

- data transcription (Lise, Andre)

22.01.03

- questionnaires Ulu (Lise and Philip (Kristine and Katrine observed), Andre and Richard)
- mistnet and insects (Nafisah, Hoa, Adam)
- weed sampling Ulu (Adam, Katrine)
- interview with supervisor of rice scheme (Dominic, Roger)
- interview with counsellor (Dominic, Roger)
- data transcription (Lise and Andre)
- SPSS (Hoa, Roger, Adam)
- midterm group discussion (all)

23.01.03

- mistnet and insects in Ulu (Nafisah and locals; Lise and Philip observed)
- interview with counsellor on village structure (Lise)
- interview with head of subcommittee of welfare (Lise and Philip)
- group discussion on culture and 'before/now' with villagers in Ulu (Lise and Philip)
- questionnaires (Katrine and Richard, Andre and Philip)
- interview with secretary of committee in Hilir, Mr. Wilson Benang (Lise, Andre and Philip)
- weed sampling in Ulu (Adam and Katrine)
- preparation of questions for representatives from the District Office and Department of Agriculture in Lundu (Lise, Andre, Roger, Richard, Katrine)
- SPSS (Adam, Hoa)

24.01.03

- meeting in Lundu with representatives from the District Office and the Department of Agriculture (Lise, Andre, Roger, Richard, Katrine, Dominic)
- mistnets and insects (Nafisah)
- GPS mapping of ricesheme (Hoa, Nafisah)
- weed sampling (Adam)
- soil sampling (Roger, Hoa, Adam)
- interview with headman (Andre, Lise, Katrine, Philip)

25.01.03

- mistnets and insects (Nafisah)
- water sampling (Dominic, Hoa, Adam, Roger, Katrine)
- waterfauna investigations (Katrine, Richard, Philip)
- Trip topepper fields (André, Lise, Philip)
- questionnaires (Roger, Dominic, Richard)
- soil and water analyses in Lundu (Adam, Nafisah, Roger, Dominic and Hoa)
- planning focusgroups (Andre, Lise (Katrine))
- womens focusgroup (value ranking and activity calender) (Lise, Katrine, Philip)
- farmers focusgroup (value ranking, pest ranking, working calender) (Andre, Richard)

26.01.03

- soil and water analyses in Lundu (Adam, Roger, Nafisah, Dominic and Hoa)

- planning youth focusgroup (Andre, Lise)
- youth focus group (discussion and ranking of values, ranking of jobs) (Andre, Lise, Katrine)
- questionnaires (Lise and Philip)
- interview with counsellor (Andre, Katrine)
- transcription of data (Lise and Philip)
- headmans house planning party

27.01.03

- moved into headmans house
- visit to the primary school (all except Dominic)
- interview with DID in Lundu (Dominic)
- presentation of fieldwork findings to the two committees at counsellors house in Ulu (all)
- party!!!

28.01.03

- bye bye to Sebandi☹