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**REPORT ON COMMUNITIES LIVING WITHIN REACH OF  
THE BUKIT RAYA NATIONAL PARK  
IN KALIMANTAN TENGAH**

Associates in Rural Development  
for  
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## ACRONYMS

BB/BRNP	Bukit Baka/Bukit Raya National Park
BPS	Biro Pusat Statistik (Central Bureau of Statistics)
Kalteng	Kalimantan Tengah
KB	Keluarga Berencana (Family Planning)
KSDA	Konservasi Sumber Daya Alam (sub balai)
LKMD	Lembaga Ketahanan Masyarakat Desa (Village Resilience Institute )
NGO	Non Government Organisation
NPMP	National Park Master Management Plan
NRMP	Natural Resource Management Project
PHPA	Perlindungan Hutan dan Pelestarian Alam (Forest Protection and Nature Conservation)
PT	Perseroan Terbatas

## PREFACE

This report is one of a number of reports produced under the Government of Indonesia's Natural Resource Management Project (NRMP) that is assisted by the United States Agency for International Development (USAID).

The NRMP, working with the Indonesian Planning Board (Bappenas) and the department of Forestry (Departemen Kehutanan), provides through a specially established project Policy Secretariat advice to Bappenas on natural resource issues relating to long and short-term national planning. In addition, working with the Department of Forestry, the NRMP carries out field activities in two pilot project areas: one in West/Central Kalimantan and one in North Sulawesi. A major focus of the NRMP is to prepare a master management plan for the Bukit Baka/Bukit Raya National Park in Kalimantan and the Bunaken National Park in North Sulawesi. Each report addresses an aspect of the planned NRMP activities which are agreed on and laid out in an annual Implementation Plan. Each report has a specific objective of making specific recommendations for future work in the area addressed.

This report examines the socio-economic conditions of three local communities living either close to or within the borders of the Bukit Baka/Bukit Raya National Park. In particular, it addresses the relationship between current and likely future socio-economic activities of these communities and the objectives of the National Park to enable the National Park Master Management Plan incorporate measures so that the economic activities of the communities can augment the objectives of the National Park.

## ACKNOWLEDGEMENTS

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## EXECUTIVE SUMMARY

A 20 day socio-economic survey was conducted by a combined USAID and Kalteng Sub Balai KSDA team in three villages located in the vicinity of the Bukit Raya national park. Maps place one village, Sebaung, within the borders of the national park. Two timber concessionaires, PT. Dwimajaya Utama and PT. Handayani & Co. gave the team very generous assistance and also the opportunity to examine their Bina Desa programs.

The major findings of the survey are:

### Demography and Social Structure

- traditional adat systems remain strong (many symbols, however, have changed). The traditional institution of leadership, however, has been replaced by the national system;
- population increase is rapid. The population of the three villages is projected to double in less than 20 years at current rates of increase;
- large family sizes of between 5.3 and 6.2 persons per household contribute to a low mean per capita income;

### Household Incomes

- per capita incomes in the two villages closest to the national park are low. Roughly 25% are below the BPS poverty level of Rp.200,000 per annum and 50% below Rp.380,000;
- households, in their world view, are still subsistence farmers. They do not seek to generate surpluses to purchase luxury goods and assets. Consequently few assets are owned other than, for about 50% of households, a reasonably substantial house;

### Agriculture and Forest Activities

- the cultivation of rice is the central occupation of all but a very small minority of households. Cultivation of rice is still rooted in religious beliefs and supported extensively by ritual;
- swidden farming fails to meet basic subsistence needs more than 50% of the time;

- with the introduction of the chainsaw, there appears to be a trend towards farming large swiddens cut from old forest. The need to weed is reduced. Yields decline but the overall crop increases;
- after the harvest, swiddens are now usually planted with rattan taking them out of the rice bush/fallow cycle. Consequently, rice swiddens, which need attention are being driven further and further away from the settlements, making that attention more difficult to deliver;
- the major source of income in the two villages closest to the national park is the production of ironwood roof shingles for sale downriver. Ironwood trees, according to most villagers, are a rapidly dwindling resource and, according to local opinion, will be exhausted in about two year's time. Consequently, there is an urgent need to establish a desirable alternative source of income for households in these villages;
- preliminary unverified figures based on local accounts of prices strongly suggest that the economics of rattan production are significantly better than the production of ironwood shingles. In contrast, the production of rice produces poor economic returns for the labour inputs required;

#### Bina Desa

- the design of current bina desa programs conducted by timber concessionaires is unlikely to lead to the levels of income desired by local villages. It also requires major shifts in technology and thinking on the part of villagers. Such an approach carries greater risks of failure than one in which serial and small shifts are required;
- rattan production falls very much within the expertise of a timber company. A number of opportunities, therefore present themselves for the timber concessionaires, through their bina desa programs to assist local villages develop rattan enterprises. They could be developed in conjunction with the timber company's reforestation programs. The approach is discussed below.

## Recommendations

### Family Planning

Population increase is rapid. The two youngest age cohorts in the population have a very high proportion of females. There is an urgent need to reduce present growth levels for the good health of the women, to improve the per capita economies of households and to reduce future land pressures. The Project therefore should develop a targeted program to produce professional and persuasive teaching aids, targeted at primary school children, to educate them in the benefits of population control. The Project should ensure that the programs are appropriately implemented in the field and should provide back up support for local teachers so that they are able to incorporate them into a school's curriculum and use them effectively.

The majority of women have joined the KB program. The present rate of population increase suggests that their monthly supplies either are not reaching them or are not being used effectively. An effective distribution system needs to be developed to ensure that monthly supplies of pills supplied by Puskesmas reach their intended destination. The new distribution system might be launched by an adult education program focused on communicating the benefits of family planning both to the woman's health and for the economy of the family. The adult education program should contain provisions for follow up so that the messages are constantly reinforced. The adult education follow up could be done by local school teachers so long as they are given appropriate teaching aids. The distribution system is likely to be most effective if it used one of the resident shopkeepers in Malawan or an elected female representative. Some system of reward might be necessary.

### Land Tenure

There are no published studies of Dohoi land tenure principles. Rights to land are likely to differ between individual communities. It is clear that some Dohoi groups at least have conventional notions of ownership of land because land is traded for consideration within the group. As there is a strong likelihood that Dohoi will consider that they do own rights to land already cultivated within the boundaries of the national park, the Project should carry out a brief investigation of Dohoi concepts of rights to land so that national park authorities are able to understand the application of the principles and negotiate with the Dohoi over land matters from a basis of mutual understanding.

## Rice Cultivation

The annual production of rice is the paramount economic consideration of the vast majority of local households. Securing basic subsistence should be the first priority of any development program. Without such security, local villagers are unlikely to experiment with alternative economic activities. Currently, planting swiddens with rattan is driving swiddens further and further away from settlements.

- A survey should be made of riparian areas, particularly just below significant rapids, to establish what opportunities there are for irrigated rice farming;
- A community development program should be developed to assist households to develop wet rice paddies. Initially, it should be based on strains of rice which do not need fertiliser as it is unlikely that households will be able to afford it. Consequently, local cattle should be used to maintain the fertility of the soil;
- A community development program should be established to get the Dohoi to alter their farming strategies so that the most fertile land is set aside for rice growing and other land is used for rattan plantations. The program should address what appears to be an urgent need to discourage the Malawan and Sebaung communities from clear felling swiddens right down to the river's edge and encourage them to start something like a social forestry project along and some way in from the river bank, perhaps planting illipe nuts (there are reports of one which fruits annually in an area close to Singkawang), to arrest the damage being done to the river bank.

The Dohoi in Riam Batang living in forested areas close to the Bukit Baka national park are very successful swidden farmers in contrast to the villages in the current survey. A careful survey should be made of the different approaches to swidden farming between the Dohoi of Kalimantan Barat and Kalimantan Tengah with an objective to determine what are the differences which lead to greater success on the part of swidden cultivators in Kalimantan Barat. These differences should be built into a program to improve yields in Kalimantan Tengah.

Given the need to raise yields and, consequently, reduce swidden areas, advice should be sought on the rice strains planted by the Dohoi and, if appropriate, their stock should be expanded with more vigorous varieties of dryland rice.

## Reducing Land Pressures

There seems to be a trend for downriver households to come upriver and farm in traditional upriver territory, thus increasing the pressures on land of the upriver people. A consequence could be to force the upriver people further and further into the boundaries of the national park. There, therefore, seems a strong case to make traditional upriver village territories into buffer zones and bar access to the farming lands to non-residents. For such an initiative to be successful will require support and, often, prompt action on the part of government agencies.

## Improving Health and Nutrition

All communities cited health as a major concern, particularly that when people are sick, they are far from health care. A partial way to address this problem would be to improve the diet of local people to make them more resistant to illness and make them more resilient when ill. The Project could make a major impact on diet by increasing the variety and range of vegetables planted in swiddens and of fruit trees by distributing hardy seed not obtainable in the villages. A preference should be made for vegetables with simple cultivation requirements.

Cultivation of vegetable gardens and small fruit groves within settlement areas is frustrated by roaming pigs. The community development program should address this issue either by getting households to locate their domestic pigs on the opposite side of the river from their settlement or by importing approaches such as the wood stockades used in parts of Sumatera Selatan and Jambi.

Opportunities for farming ponds created by timber roads being driven through small valleys are good and might well be investigated in a community development program.

## Rattan Production

Rattan returns a daily rate about six times greater than the swidden. Preliminary estimates indicate that a family of four just selling wet rattan would get an annual per capita income of Rp.830,000 from 180 days work of the two adults which would be twice current per capita income levels. Cutting out the middle man should increase the difference to seven times and provides work for almost double the number of people. The economics of rattan production need to be determined. Assuming they are promising, as initial figures indicate, community rattan production could become a focus of the timber companies' bina desa program. Commercial arrangements could also be entered into

with the local timber concessionaire which would enable large loads to be trucked to the market at a lower unit cost than using local river craft. If the economics and logistics justify it, eventually the processing could produce lengths of the appropriate quality for sale directly to Banjarmasin or similar major marketplace. There would be advantages in incorporating the community so that it would be able to enter into contracts. It would also gain a competitive advantage over other local producers by being organised and by being able to manage quality control issues consistently.

Timber companies should approach bina desa programs in a business like way. Consequently, corporate objectives should be established for the programs and be part of a company's corporate plan. The programs should contribute to a company's image as a "good corporate citizen". A major benefit of an effective program lies in the improved public relations of timber companies on the international scene. Properly designed, an effective bina desa program should contribute significantly to a company's future profitability.

A timber company's expertise lies in the production and transport of timber and the subsequent processing in sawmills. It does not lie in general community development. Rattan production and transport to market lies within the general expertise of timber companies. They therefore could assist local communities to develop this expertise to manage their own rattan production. Rattan could also be planted in forested blocks as part of a reforestation program or, alternatively, as part of a social forestry program. A pilot project should be developed with a small number of timber companies to develop the concept of a partnership between timber company and local community to develop rattan production for the community's benefit. The partnership should investigate the feasibility of local communities combining rattan planting with timber planting. The pilot project could be either part of the timber company's bina desa program or, more appropriately, part of its general public affairs program by which it pursues a vigorous policy of being a good corporate citizen. The policy could also be extended to embrace issues facing the national park.

Current approaches of a typical bina desa program are unlikely to improve the wealth of communities significantly. Community development also lies outside the general expertise of a timber company and, to achieve its major objectives, there is no reason for it to acquire these skills. The pilot project with timber companies should also include as a component the development of some kind of local organisation, probably in the NGO field, to develop an expertise in community development projects and a willingness to locate personnel in remote areas. It would partly fund itself by contracting its skills to timber companies in their bina desa programs. It should also be linked to the broader

network of national and international NGOs so that it has access to a broader funding base and to the kinds of training programs that it will require to train its own personnel. Ideally, the NGO would be managed by a Board of local people and be accountable to the communities it serves.

#### Sustaining Local Cultural Activities

The Project could help revitalise rattan mat weaving by obtaining photographs of the great Ot Danum mats held in museum collections and making blown up copies available to communities. It might also consider arranging for the marketing of any resultant supply; which might be developed as part of a community development program, to trade outlets like museum shops in the West.

The Project should consider ways to maintain the vitality of the music, dance and other artistic activities of the communities. An annual competition is the way many Dayak groups maintain such vitality. A national park pesta would be an opportunity to draw neighbouring communities together, reinforce their interest in and ownership of the objectives of the national park and be an opportunity to contribute towards the maintenance of Dohoi cultural vitality which in time might produce significant benefits whenever tourism becomes a factor in national park management. The Project could create a lasting mark by contributing "national park" cups for a number of events.

#### Community Development

Finally, these recommendations should be tied together through the mechanism of a community development program. Expert assistance will be required. Given the number of communities in the project area and the critical need to get the development programs right to ensure that the national park is not put under any pressure from land hungry swidden farmers and that timber concessions remain undisturbed. If the national park is identified directly with a series of community development programs, it will also contribute to a community's interest in and identification with the national park. The Project therefore, should identify an NGO which will be able to support the community development programs in the field. Preferably, it should be an organisation that has strong linkages with local indigenous development and a proven record of success. The organisation should also be able to demonstrate an ability to work in well with government institutions. Given the current strength of Hinduism, it would be preferable that the NGO should be a lay one.

## Master Plan for the National Park

The Project is not a community development project and herein lies a dilemma. It has not been set up nor resourced to manage a community development component. Nevertheless, the Project, in the development of a master plan for the national park, should consider the importance of the following to any community development program in the settlements abutting the national park:

- providing resource material for an NGO to use in the design and teaching of community development training courses. From the Project's point of view, there would be a strong justification for funding at least a conservation and natural resource management component in such a course;
- working with an NGO in the development of a locally based community development program, initially focused on a small selection of villages closest to the national park;
- seeking avenues for providing funds for the NGO to establish itself so that it is able to support the project's objectives;
- seeking means to assist the NGO to strengthen its internal management to ensure that the demands of the project will not overstretch its capacity to deliver its existing and the proposed additional programs. In this regard, the timber concessionaires might be able to provide some assistance. For example, NGO management might be able to participate in internal management courses run by the timber concessionaires.

Finally, it will be important to bind local communities into a strong association with the national park and one in which the communities actively support the objectives of the national park. The National Park Management Master Plan (NPMMP) produced by the Directorate-General of PHPA through its regional KSDA office, should therefore seek means to give local communities a tangible association with the management of the national park. Wherever possible, communities should be intimately involved with the running of the national park. For example, they could be contracted to watch over the boundaries and report any intrusions into the national park. They might be given some kind of authority to be able to act to prevent downriver people from being able to enter into the national park to exploit its resources. What will be most effective is for a whole community to be contracted to act rather than some selected and fortunate individuals. In the latter case, those enjoying no benefit are

very likely to see no benefit in the association and be less inclined to act in the best interests of the park. Some symbol of the association might also be considered like a uniform and signs at the entry to the village. The association could be reinforced by having annual meetings of the communities as discussed earlier in this chapter.

## 1. INTRODUCTION

This report extends the socio-economic surveys conducted by the NRMP to the Bukit Raya region of the Bukit Baka/Bukit Raya National Park (BB/BRNP). It follows an earlier one conducted in the Bukit Baka region by Jill M. Belsky which resulted in a report entitled: "Balancing Forest and Marine Conservation with Local Livelihoods in Kalimantan and North Sulawesi". Wherever possible, this report seeks to combine the quantitative results of the Belsky survey with the current one so that comparisons can be drawn and the consequences of regional and local variation can be considered in the overall National Park Master Management Plan (NPMMP) produced by the Directorate General of PHPA through its regional KSDA office.

This socio-economic survey was carried out in three villages located in the upper Katingan headwaters - Tumbang Habangoi on the Habangoi tributary and Tumbang Malawan and Sebaung on the Heran tributary (see figure 1 for location). Village profiles of each of these villages are given in Appendix 3. For the past twenty or so years, the settlements of Malawan and Sebaung, physically, have been joined into one attenuated settlement. The villages, however remain distinct each having its own Kepala Kampung and separate village administrations. At night, the distinctiveness is highlighted by the fact that Malawan has implemented an electricity project and the street lights stop at the boundary between the two villages. One consequence of the physical joining of the two villages has been that the traditional upriver boundary (which delineated the area beyond which villagers could not farm) between the two villages has disappeared and households from Sebaung farm below the boundary and those from Malawan above it.

Two other communities on the Kalimantan Tengah side of the national park were not surveyed because of time constraints. One, Tabulus is in the general vicinity of Malawan and Sebaung and it is reasonable to assume that its socio-economic conditions would be similar to those of Malawan and Sebaung. Tabulus is located within the timber concession area of PT. Dwimajaya Utama and is the last village on the Tahei river which joins the Heran river about 7 kilometres downstream from Malawan. The second community, Riam Batang is most easily accessed from Kalimantan Barat. Given its remoteness from the communities in this survey and given the fact that maps indicate it is also located within the confines of the national park, it might be worth visiting to establish what, if any, variations occur in its socio-economic activities.

Traditional land tenure arrangements are always important when access rights to land might be altered as is possible as a result of the BB/BRMMP. One aspect of such arrangements is that, so long as land pressures are not great, they tend to become fairly lax

and imprecise through time as memories fade. In bush fallow system, memories fade about the precise boundaries of land which has not been farmed for some time. As the fallow period becomes extensive, memories also fade about who actually first cleared the land and thereby obtained priority rights to it. When land pressures are great or threats occur, memories become very precise and razor sharp. The present survey had insufficient time to make a satisfactory study of land adat rules. There is a strong case for including one in the future so that when negotiations take place about such matters as enclaves and buffer zones, the negotiations are based on a realistic understanding of the principles and rules governing land utilisation of local communities.

Maps indicate that of the three villages included in this study, only Sebaung is actually located within the confines of the national park. The maps probably refer to the former location of Sebaung some two hours upriver from its present location. Swidden farms and rattan gardens are still actively harvested upriver from this old location and it seems reasonable to assume that they are well within the boundaries of the national park. The boundaries of the national park, however, are unclear. A timber concessionaire, PT Dwimajaya has built a feeder road within three kilometres of the upriver Sebaung farms and their maps indicate that this road and the Sebaung farms and gardens are well within their timber concession. Aerial photographs should confirm the relationship between the farms and gardens of the Sebaung and Malawan communities, the timber concession of PT Dwimajaya and the boundaries of the national park. They would also indicate the extent of land use by the Malawan and Sebaung communities both within the confines of and adjacent to the national park. The photographs should also indicate alternative sources of land which, with improved access through timber roads, might be regarded as reasonable alternatives to the continued farming of old regenerated land within the boundaries of the national park.

A critical aspect of the BB/BRMMP will be the conservation of riparian areas in the headwaters of the Katingan. The marine life appears reasonably diverse in the Heran river with quite large fish being caught locally (one 6.5 kg. ikan sasak (known as ikan semah in Sarawak) was the largest witnessed during the survey). The foreshore of the river, however, seems to be undergoing some fundamental change which might have detrimental impacts on marine life both in the locality and downstream. Moving up the river Heran, one could not but notice the litter of tree trunks actually in the river and hindering progress. Many had been cut by chain saws. In addition, a surprising number of trees growing on the river bank had been uprooted and had slid into the river suggesting that banks were beginning to erode significantly. It is reasonable to surmise that the advent of the chainsaw has encouraged farmers to clear right down to the river's edge whereas, formerly, the additional work required to fell a tree

overhanging the river hardly warranted the effort in terms of the additional rice yields it might provide. Much of the river Heran's banks remain intact. An immediate program informing the Malawan and Sebaung communities of the long term consequences of clear felling right down to the river's edge and encouraging them to start something like a social forestry project along and some way in from the river bank, perhaps planting illipe nuts (there are reports of one which fruits annually in an area close to Singkawang), might arrest the damage being done to the river bank.

The communities studied belong almost wholly to the Dohoi subgroup of the Ot Danum. The Ot Danum are one of the many Dayak groups which have been little studied in the anthropological literature. Currently, a French anthropologist is working with the Dohoi in Kalimantan Barat, but his research results have yet to be published. Consequently there is little background material on either the Ot Danum or the Dohoi.

One feature of a number of Dayak groups is the relative diversity of both dialect, customs and land use arrangements within the group. Not only is there variation between neighbouring villages but there is significant variation between groups living in different watersheds and experiencing different land pressures. For example, in the Genung Niut area of Kalimantan Barat, neighbouring villages some five minutes distant from each other spoke markedly different dialects of Bidayuh but had similar land use rights. In a neighbouring watershed, another village speaking the same dialect had totally different land use rights. Whether the Dohoi have significant variations between groups, especially between those living on the Bukit Baka side of the national park and those living on the Bukit Raya side has yet to be determined. It seems that there is a reasonable likelihood that whereas there are only slight variations in language, other institutions might be diverse. For example, very preliminary discussions suggested that there might be significant variations in land use rights between Habangoi and the joint villages of Malawan and Sebaung. For the purposes of the BB/BRMMP, it will be important to establish whether or not such diversity exists and, if it does, what the variations are and how they might be addressed in the management plan.

One aspect of Dayak swidden agriculture adaptations which socio-economic surveys, by the very nature of their focus, ignore is the importance of forest products and wildlife to the diet and life of the Dayak. Unlike sawah cultivation, swidden agriculture is non-intensive and rarely requires daily inputs in excess of a few hour's work. Men spend much of their time fishing and hunting, activities which do not require adherence to a strict timetable. Fish and meat provide a valuable supplement to the normally vegetarian diet of the Dayak. During the fruit season, it is the men who climb the fruit trees to release the fruit for

the waiting women below. Men work in the swiddens felling large trees, clearing the scrub, firing the fields, dibbling, guarding the fields from intruders and carrying the harvested rice back to the granaries. At the most, this would account for five months work a year of a fairly un-intensive kind. Women spend longer in the swiddens, having the onerous responsibility of keeping the swidden free of weeds. The three to four months after the rice has been planted usually provides an abundance of vegetables and fruit like water melon from the catch crops sown in the swidden. For the rest of the year, women frequently forage into the forest in search of tubers, crowns of palm and other vegetables to supplement the daily intake of rice. They also access small streams (and the major streams when they are low during dry spells) in search of sprat and other small fish. In a whole year, these subsistence activities of men and women outside the swidden account for more of their time than actual work in the swidden. In addition, the forest provides wood for building purposes, for decoration, for medicinal purposes and for firewood and, as economic opportunities expand, now for materials like rattan and ironwood shingles for sale.

The rather diffuse lifestyle has major impacts on patterns of behaviour and on the Dayak "mindset". A normal day consists of a variety of quite diverse activities in marked contrast to the sawah agriculturalist who focus almost all his efforts on the intensively cultivated sawah, palawija or houseslot. The Dayak is not subject to an intensive regime requiring work attendance and specific outputs during a day. Economically, all that the traditional Dayak lifestyle requires is that just enough is done to ensure that the subsistence crop (which is not very demanding) thrives and that there is sufficient garnish to supplement the daily intake of rice. Such an approach to life does not readily adapt to a five day working week, nor to the demands of intensive agriculture heavily dependent on scientific crop rotations, purchased inputs and relatively intensive labour inputs. This issue will be taken up in Chapter 4 which discusses the Bina Desa programs of timber concessionaires which, in the area studied, focus predominantly on sloping agricultural land technologies and intensive vegetable cultivation.

Dohoi culture has changed little over the past few decades. The *kaharingan* religion remains intact, though in Habangoi, *keramat* (offering places) were less in evidence than in Malawan and Sebaung. Major festivals now require the sacrifice of buffalo or a bullock as part of the regeneration rites. The traditional political system has been transformed and the quality of local leadership has been a major casualty. Serious illness is still treated by local dukun following traditional measures of purging the patient of evil and despatching it in symbolic boats to the sources of all evil in the murky waters of the underworld. Malawan is currently preparing for a *tiwah* ceremony, in which the bones of people who have died since the last such ceremony are

disinterred and reburied in ossuaries in the village. Death itself is visited by masked dancers representing the guides to take the departed soul to its last resting place. The masks themselves are placed below the cemetery just above the water line so that in the next flood they would physically depart on their journey to the afterworld. Carving of figures (*patung*) and musical instruments is still practised by the men. Rattan weaving is strong among the women, though most of the rich patterns for which the Ot Danum were justly famous have now been forgotten. Photographs from museum collections and short demonstration courses for the women would quickly revive these forgotten patterns (Benuaq textile weaving was revived by the Indonesian government taking a number of women to Surabaya to "relearn" the skill). So long as the religious ideas remain intact, the art will remain alive as women experiment with new patterns and modern images. Culturally, the Project could help revitalise rattan mat weaving by obtaining photographs of the great Ot Danum mats held in museum collections and making blown up copies available to communities. It might also consider arranging for the marketing of any resultant supply, which might be developed as part of a community development program, to outlets like museum shops in the West. Orchestras, music, song and dance are still all very strong with the best music featuring flutes (*suling*), guitars (*kecapi*) and bowed rebab. Both men and women sing. Palangkaraya music shops sell cassettes of the music of the closely related *Ngaju Kahayan* group and there seems no reason why Dohoi music could not also be recorded professionally. While the dress is drably western, the artistic culture remains strong and would undoubtedly be attractive in performance and for sale to tourists on a break in their journeys either to or in the national park. The Project should consider means to maintain the vitality of the music, dance and other artistic activities of the communities. An annual competition is the way many Dayak groups maintain such vitality. A national park *pesta* would be an opportunity to draw neighbouring communities together, reinforce their interest in and ownership of the objectives of the national park and be an opportunity to contribute towards the maintenance of Dohoi cultural vitality which in time might produce significant benefits should tourism become a factor in national park management. The Project could establish a lasting mark by contributing the "national park" cups for a number of events.

A major instrument of change in communities is education. All communities had a local *sekolah dasar* teaching all the primary levels. Concerns, particularly in Habangoi, were expressed about the energy of the teachers and many considered that they would need to be revitalised for their children to be able to advance through the educational system. The importance of education is illustrated by the fact that in Habangoi, households used to stay for periods of four months and more in their swiddens, whereas now they return frequently to the village to ensure that their children are taking school seriously. No children from any of the

three villages had reached SMA level, though there were a few in the SMP located downriver in the local kecamatan headquarters. In rural areas, education is a major instrument in outmigration. The better educated tend to head for townships and the opportunities of paid employment. For the management of the national park, there would be advantages if neighbouring communities enjoyed a quality educational service for it would increase the likelihood that a number of students would reach SMA and above and migrate from the villages. If they married locally, they would also take their whole household. A good education program might have an important bearing on population increase (as well as producing people more likely to be sympathetic to the aims of family planning) and consequently on pressures threatening the integrity of the national park.

A second area of consistent concern in each village is the poor access to health services. Until roads are constructed and a public transport system introduced, this is a situation which is unlikely to improve. What can be done, however, is to introduce a program to improve the diet of the communities and thus make them more resistant to illness and better able to recover from it. Chapter 4 discusses recommendations about measures which can be taken to improve the diets of the local communities.

### 1.1 Communities and the Bukit Raya National Park

Without exception, no one in any of the communities was aware of the existence of the Bukit Raya National Park. None had any idea of the implications for them of being located close to or within the boundaries of a national park. A few thought there would be tourism opportunities and they could benefit from running small guest houses and from acting as guides in the national park. Notions of conservation are not part of the Dohoi lexicon; so there was no realisation that some of their economic pursuits might have to be circumscribed.

Without exception, people also felt pleased that a national park had been declared close to their settlements. They felt (with absolutely no evidence to support the feelings) that, on balance, it would bring more benefits than negative consequences. Consequently, there is a reservoir of goodwill towards the national park which is an asset worth developing. It would therefore be advisable, as soon as possible, to include the local communities in the planning process so that they develop a direct interest in and association with the national park and perceive that their own interests are in no small part linked with the success of the national park.

**The National Park Management Master Plan (NPMMP) should seek means to give local communities a tangible association with the management of the national park. Wherever possible, communities**

should be intimately involved with the running of the national park. For example, they could be contracted to watch over the boundaries and report any intrusions into the national park. They might be given some kind of authority to be able to act to prevent downriver people from entering into the national park to exploit its resources.

The most effective approach would be for a whole community to be contracted to act rather than some selected and fortunate individuals. In the latter case, those enjoying no benefit are very likely to see no benefit in the association and be less inclined to act in the best interests of the park. Some symbol of the association might also be considered like a uniform and signs at the entry to the village. The association could be reinforced by having annual "get togethers" of the communities in which the objectives and development of the national park are discussed which has been touched on earlier in this chapter.

## 1.2 Purpose of the Socio-economic Survey

The purpose of the survey was set out in the terms of reference which are given in Appendix 1. The purpose noted an "urgent need for solid qualitative and quantitative data regarding household/community dependence on forests within and adjacent to Bukit Raya area, Central Kalimantan."

It was also considered that "given that the livelihoods of many communities depend to a lesser or greater extent from natural forest resources, both timber and non-timber, NRMP needs comprehensive information on why, how and how many households in the Bukit Raya area, particularly "enclave communities", depend on protected (national park) and adjacent forests. The results of the proposed survey will provide needed data and information to fit the basic needs of local communities to the goals and objectives of the national park."

The survey was carried out during a field trip which was limited to 20 days, a significant proportion of which was required for travel. The survey was conducted by a management consultant who also had considerable experience working with Dayak communities in Kalimantan and two members of the Sub Balai KSDA office in Palangkaraya. One of the KSDA officers was a woman who concentrated on women's socio-economic activities and the problems they experienced. The survey methodology is briefly described in Appendix 2.

During the survey, four nights were spent in Tumbang Habangoi where interviews were conducted with those households who returned each evening to the village from their swiddens. The greater number of households spent lengthy periods living in their swiddens and only returned to the village occasionally.

These swiddens were quite distant from Tumbang Habangoi and, given the short time available, were not visited. The survey, consequently, is skewed towards those households farming close to the village who also tended to have the greatest contact with employees of the local timber concessionaire, PT Handayani through selling vegetables and other goods to them. Given the small size of the survey and the fact that no household farming distant from the village was included in it, the figures should be treated with circumspection.

Nine nights were spent in the twin villages of Malawan and Sebaung. The combined villages are a little over half the size of Habangoi with the result that a large representative sample of households in both villages was interviewed. More emphasis was placed on these two villages because of the fact that Sebaung seemed to be located within the boundaries of the national park and it seemed reasonable to assume that both villages would have farming and other activities within the national park.

Table 1 below summarises village sizes and the samples interviewed for socio-economic information.

**Table 1. Sample Sizes of Villages Surveyed**

Village	Number of Households	Sample Size	%
Habangoi	96	8	8.33
Malawan	37	27	72.97
Sebaung	20	16	80.00

In addition to the strictly socio-economic interviews of households, questionnaires were also enumerated to establish the work patterns of women and men and to obtain some idea of the uses to which the forest is put, and to obtain broad data about the settlement.

## 2. POPULATION AND DEMOGRAPHY

The populations of Malawan and Sebaung and, to a slightly less extent, Habangoi are fairly uninhibited in their growth. The population appears to be characterised by high fertility on the part of women, an early start to families with reports that girls often marry before menstruation and a dearth of women over the age of 50. Birth control is practised, with Puskesmas for example reporting that at Malawan and Sebaung some 70% of the population of child bearing women are participants in the program. As yet, at best, it has only had a marginal impact on a rapidly accelerating population.

The demographic figures, especially those at Habangoi must be treated cautiously. At Habangoi, the kepala kampung was absent for the short period we were present in the village; so we could not get access to the daftar penduduk. The population, therefore had to be reconstructed from an out of date kecamatan list obtained from PT Handayani, school records, a set of old records which was salvaged from the balai desa and a workshop of men and women to determine the family size of each household and the ages of each member of the household. In such circumstances, the tendency is for the ages of older people to be underestimated (or, if very old to be overestimated) and to forget about infants and the very young. In a population of 96 households, it is likely that some households might have been omitted. At Habangoi, therefore, it is probable that the youngest age cohort of 0-4 is underreported and the percentage of the population under the age of 15 be greater than reported. At Malawan and Sebaung, while the daftar penduduk were not up to date, ages and family size were able to be checked with respondents during interviews. The number of changes which were made to the original list would increase one's caution about the accuracy of the Habangoi figures.

### 2.1 Population

Population structures undergo change continuously because of a number of events affecting it. Age and sex of a population are the two most important factors causing change in a population structure. These two demographic characteristics have great significance in almost all kinds of population studied.

Table 2 shows the distribution of the population of Habangoi by age cohort. There appears to be negligible out or in migration of households or individuals with marriage and movement of the wife being the major factor. The population appears to be increasing at about 4% per annum. With 46.4% of the population under the age of 15, the figures indicate that, at the current rate of increase, the population will double in just under 20 year's time. Such an increase, assuming that migration figures remain

stable, would have profound implications on land requirements and in the relationship between forest concessionaires and local villagers and, above all, in the ability of national park managers to conserve the integrity of the national park. The figures certainly strongly indicate that it would be in the best long term interests of the forest concessionaires to assist villagers to establish stable sources of income which don't require ever increasing land use and meet local requirements for sustenance and a reasonable standard of living. Employment of local people might provide a future benefit for the timber concessionaire in that the employment wage might reduce a household's interest in swidden farming and thus reduce future pressures on the land. For the timber concessionaire, the future pressures could well take the swiddens into regenerating production forest.

A second feature of the population figures for Habangoi are the high dependency and mother/infant ratios. The dependency ratio is 98.9 which means that every productive adult supports approximately one dependent. Such a high rate has significant impacts on per capita income levels as will become evident in chapter 3. The high rate also probably has impacts on the efficiency with which swidden farms are managed. With many additional mouths to feed, households are encouraged to farm larger swiddens which are beyond the capacity of the adults to cultivate efficiently. Weeding is usually the limiting factor on size and efficiency. An over large swidden usually results in insufficient weeding and consequent reductions in yield (although the required volume might be attained).

The mother/infant ratio of .78, when combined with the high dependency ratio, strongly suggests that infants are either somewhat neglected and left to fend for themselves or under the care of a relatively young sibling or that mothers are severely constrained in the amount of time that they can devote to subsistence activities. The former seems most likely with women reporting that they are expected to return to the fields about 10 days after giving birth. The neonate is simply left in shade while the mother works in the field, being tended to whenever it cries. Data was not collected on infant mortality, but anecdotal evidence suggest that it is probably quite high. The mother/infant ratio also indicates that a large number of women of child bearing age do still support an infant.

An unusual aspect of the population statistics is the low number of women over the age of 50 in comparison with men. Usually, one would expect the number of women at this age to outnumber men. At Habangoi, they comprise only 35% of this age group, a little over half the number of men. One is left to speculate whether or not bearing one's first child at a very young age followed by frequent pregnancies and the fact that women work long and onerous hours in the fields and domestically do take a very

serious toll on a woman's life expectancy. Such figures would certainly suggest that a program encouraging women to participate actively in birth control and using life expectancy as an argument might find some sympathetic ears on the part of young women.

The population figures for Malawan and Sebaung have been combined because the individual populations are so small to make separate figures not very useful. They are given in figure 3. The population growth of Malawan and Sebaung has been at an annual rate of about 5% for the past 20 years, though during the past five years it seems to have decelerated to about 4%. With 51% of the population under the age of 15, present growth suggests that the population could double in between 15 and 18 years time. Such an increase, given the proximity of both villages to the national park and the probability that they are already farming within it, could, unless managed very effectively, have major repercussions for the park.

Malawan and Sebaung have attracted some inwards migration both into the village and to farm within the traditional territory. One migrant from Tumbang Heran acts as a middleman trader, buying rattan basah and drying it for sale in Tumbang Samba. A second migrant has moved from Kalimantan Barat and works timber for sale using his chain saw. Both these households are adamant that they plan to return to their native villages in due course. Given that they moved to Malawan to take advantage of opportunities that were not present in their native areas, there seems some likelihood that they will not return while economic opportunities remain promising in Malawan. A third family has recently moved to Sebaung to take up residence with in-laws and expect that these arrangements will be permanent.

A second category of migrant might also have impacts on the national park. This category comprises households from downriver villages who are permanently farming in the traditional territory of Malawan. Two households with seven very young children have been farming above Sebaung and Malawan for the past two years and their oldest children go to the local primary school. A number of other households are farming downriver in traditional Malawan territory. Conspicuously, they do not hail from Tumbang Tahei, the downriver village, but from Tumbang Heran which is some two hours downriver by kelotok. Whether or not this is the beginning of a trend, with downriver households suffering some kind of land pressure is impossible to say. Certainly, according to informants in Malawan, it is a new phenomena. It is causing some concern because land use usually also delivers future rights to that land with the result that part of Malawan's territory is taken out of their own productive cycle and converted to "foreign" ownership. Consequently, the Malawan community has no means to control the activities of these households in what was traditional Malawan territory. An example of such loss of control is the fact that

one household has cleared a traditional forest area used by Malawan households to collect wild edible palms. The razing of this particular area caused no little comment in Malawan with a report being made to the local kecamatan headquarters. Loss of land to non-residents also means that the Malawan community has to operate within a more restricted land base, which in turn, given the current rate of population increase, might lead to land pressures forcing households to farm further upriver and within the confines of the national park. Under traditional political systems, such "invasions" from other villages would have been strenuously resisted. Now little is done other than reporting the fact at the Camat's office. There, therefore, seems a strong case to **make traditional upriver village territories into buffer zones and bar access to the farming lands to non-residents.**

The dependency and mother/infant ratios of Malawan and Sebaung are both markedly higher than Habangoi. The dependency ratio of 119.7 means that each working adult has to support more than one dependent and is testimony to the rapid population growth being experienced by the villages at the moment. The very high mother/infant ratio of 93.0 has the same consequences as for Habangoi and also probably bears testimony to the young age at which women start their families.

One interesting aspect of the Malawan and Sebaung population statistics is the unusually high proportion of young females compared with males. 62% of the population under the age of 10 is female. It will certainly result in an increasing number of child bearing women, so long as, presumably they can find husbands to father the children. Unlike many Dayak groups, Dohoi women generally move to the husband's household on marriage, which might result in a number of women migrating out of the villages to join their husbands and so act as a break on the population increase. Conversely, if there are land pressures in downriver villages, it is more than likely that husbands will move upriver to where the economic opportunities are more promising. A third and least likely alternative would be for men to take more than one wife (either legitimately according to Dohoi custom or on a de facto basis).

Population control is pursued vigorously by the Indonesian government. In Malawan and Sebaung, Puskesmas visits the settlement on a given day each month to distribute pills to the women who have joined the program. According to Puskesmas, 36 of the 57 women in the 15 to 45 age group have joined the KB program.

There are some significant problems with the regular distribution of pills. The Dohoi are a Dayak group which spends significant amounts of time away from the settlement in their swidden huts. Many households only return to the settlement about once a month, which apparently is more than formerly when households would

remain away from the settlement for periods of up to four months. Consequently, the probability that a woman would actually be in the settlement on the only day in the month that Puskesmas visits the settlement is slight. Onward and timely redistribution of sachets of pills from settlement to swidden is, consequently, of the utmost importance if the program is to be successful. Currently, there is a lot of anecdotal evidence to suggest that those women not in the settlement when Puskesmas visits generally do not receive their month's supply of pills. Consequently, though the number of women who have joined the KB program is promising, its impacts are probably not as effective as they might be.

Alternatives to the pill do not appear to be promising. Injections are the preferred option among most women because one injection is sufficient for a month. The problems, however, with injections are similar to those of distributing the pill; only the injection needs to be performed by a professional and therefore requires the presence of the woman while arrangements can be made for the onwards distribution of a supply of pills. IUD devices are not popular with the women given the physical nature of their work. Similarly, vasectomy is not popular among men and would be difficult and costly to obtain because it would require visiting a centre to have the operation performed.

Population control is probably the most pressing issue to address if there is to be a continuing long term productive relationship between the national park and the people living either in the vicinity of it or within its boundaries. It seems no less important in Kalimantan Barat where Belsky (1992:39) reports that on average, half the population is under 14 years of age suggesting an even faster rate of increase than that being experienced in Malawan and Sebaung. Giving birth at a later age, spacing of births and restricting the number of births is also in the best long term physical and economic interests of women. The women also acknowledge these facts, though most would like to have four children. Poverty, however, has a tendency to encourage households to marry off their daughters early so that they cease to be a burden on the household. Hence social pressures on early marriage are intense. With few entertainment opportunities, there are no alternative distractions. To be most effective, a program should be targeted at the most promising group. With two large age cohorts of females in the 0 to 10 age group beginning to move towards maturity, the largest and most suggestive target group is pre-school and primary school (SD) children. An additional benefit of targeting schoolchildren for educational programs is that they often influence parents also to change their attitudes and behaviours. This phenomenon is no less true for rural people as for sophisticated urban dwellers in the west. In addition, remote rural schools are virtually bereft of good teaching materials. The project has the resources and access to people skilled in the presentation of persuasive material. It also has

the resources to produce the material within the context of the SD curricula and to help SD teachers in the field develop the material into interesting lessons (possibly extending them into the adult education field) for the children. Professionally prepared and attractive handouts would enable the children to take them home and they would have every temptation to pin them on the bare walls of their dwellings. It is therefore strongly recommended that the Project develop professional and persuasive teaching aids, targeted at primary school children, to educate them in the benefits of population control and to ensure that they are appropriately distributed in the field and the users know how to make the most of them.

Secondly, it is important to address the current burgeoning population effectively. An effective distribution system needs to be developed to ensure that monthly supplies of pills supplied by *Puskesmas* reach their intended destination. The new distribution system might be launched by an adult education program focused on communicating the benefits of family planning both to a woman's health and for the economic good of the household. The program should contain provisions for follow up so that the messages are constantly reinforced. The distribution system is likely to be most effective if it used one of the resident shopkeepers in Malawan or an elected female representative. Some kind of remuneration might be required to encourage delivery.

Table 2. Distribution of the Population of Habangoi

<u>Males</u>		<u>Females</u>	<u>Total</u> %
4	65	3	100.0
5	60	5	98.8
11	55	4	96.8
6	50	2	93.9
10	45	10	92.3
13	40	9	88.5
18	35	12	84.3
13	30	20	78.5
19	25	17	72.1
20	20	22	65.1
35	15	20	57.0
39	10	30	46.4
34	5	46	33.1
44	0	48	17.6
271		248	519

**Table 3. Distribution of the Population of Malawan and Sebaung**

<b>Male</b>		<b>Female</b>	<b>Total</b>
1	65	1	66
2	60	64	124
0	55	59	114
1	50	54	104
10	45	49	94
12	40	44	84
6	35	39	74
6	30	34	64
7	25	29	54
11	20	24	44
19	15	19	34
22	10	14	24
23	5	9	14
18	0	4	4
<b>138</b>		<b>152</b>	<b>290</b>

### 3. AGRICULTURE AND ECONOMICS

Cultivation of rice is at the centre of Dohoi economics, religion and world view. Its importance in terms of an attitude to and a way of life cannot be exaggerated. Religious ceremonies focus on the growing of rice. Ritual paraphernalia, which are believed to enhance the spiritual, extraterrestrial and terrestrial environment in which the rice grows are kept by households and handed down through generations. Rice itself has a sacred aspect. Each household possesses a sacred core of rice seed on which the religious ceremonies are focused and which are usually sown first. The rice itself is believed to possess a spirit and much of the religious ceremonies are to ensure that the rice spirits are looked after appropriately and, therefore will fruit abundantly. The great kaharingan ceremonies, the tiwah, which ostensibly are about death and secondary burial, in fact are about renewal and regrowth. In Ot Danum myth, death leads to rebirth.

In the Dohoi creation myth there is an upperworld represented by the hornbill and an underworld represented by the dragon or water serpent. The tree of life is created by an Almighty, Mahatala (of the upperworld) while his sister (of the underworld) takes buds from it to create another tree in the upperworld from which rice originates. The sister sets a female hornbill to alight on the tree of life and it eats its buds. Mahatala responds by making his sword change into a male hornbill which also alights on the tree of life to quench its hunger. By then there is no more to eat. Male blames female and the two fight. In the course of the fight, the female kicks part of the tree. Chips flake off to form a woman and a boat in the shape of a waterserpent into which the woman gets. As the battle continues; so the tree of life is destroyed. The male hornbill slits the throat of the female, out of which springs a male who gets into a boat shaped like a hornbill which had also been made from chips from the tree of life. Finally, the two birds kill each other. Their bones float downriver to form the tree of life in the land of the dead, thus ensuring eternal life after death. The man and woman eventually reach land, procreate and produce three sons, one of whom becomes associated with the underworld and the water serpent, the second with the upperworld and the third sets up house in the primaeval village from which all Ot Danum villages emanate.

After the creation, skies and seas separate. The gods retire to the heavens, there to commune with humans through the medium of birds. The goddess of the underworld, a denizen of the waters, becomes intimately associated with agriculture and fertility.

In the *tiwah* ceremony, in a re-enactment of the epic battle between male and female hornbill, the tree of life is ritually destroyed as the guests enter into the village holding the festival. The festival is concluded by the ritual killing of the two birds through the sacrifice of slaves, or a substitute in the form of buffalo which leads to the creation of woman and man and the renewal of the life

cycle. Rice, which provides the substance for life, is intimately associated with the ceremonies and the beliefs supporting them.

It is important to understand that the Dohoi do not have a sacred duty to plant rice; only that rice has a sacred aspect. Consequently, a number of Malawan and Sebaung households now do not plant rice, preferring to buy it out of the money they make from fashioning and selling forest products. They remain a small minority, but many are prospering and might well represent a trend for younger households. Significantly, the *kepala kampung* of Malawan is one of them indicating that support for promising economic change would be likely to come from the local leadership.

### 3.1 Rights to Land

A study of rights to land was not made. Dayak rights to land vary from pioneering communities with apparent inexhaustible supplies of land where the clearing of an area for a swidden gives no future rights to that land other than the year following, to other groups which have clearly demarcated fields and land is specifically passed down to a named child who then has sole right of disposal of that land. In between these two extremes is land which is inherited by kin groups which expand at every generation. First all the children have access to the land, then their children and so on until after a few generations, almost the whole of a village will have some right to virtually every piece of cultivated land in the village territory other than gardens planted with permanent crops. In such circumstances, an understanding of the authority systems is an important precursor to an understanding of how rights to land are accessed. Authority gives a person possessing it powers equivalent to a trustee. That person cannot dispose of the asset unless he or she has the agreement of all parties which have an interest in it. The person, however, can determine which party can have use of the asset and where there is a dispute, effectively arbitrate between the disputants. The person who inherits the authority differs from Dayak group to Dayak group. It can be the eldest child (regardless of sex), the eldest son, the eldest daughter, the youngest child, the youngest daughter or the eldest child remaining in the household.

The Dohoi system as it exists in the national park area has yet to be investigated. There can be no certainty that the system which applies in one river system need necessarily apply in another. Systems develop through time. Should the Dohoi have moved into Kalimantan Tengah while they still had a pioneering system of rights to land, it is quite probable that there would be marked differences between Dohoi groups.

There is a strong possibility that there are variations in rights to land between the Dohoi in Habangoi and in Malawan and Sebaung, which is not altogether surprising as there are slight dialectical differences in their language. cursory discussions suggest that Habangoi might have a system in which households have equal access rights to unused land within the territory of the village. In Malawan and Sebaung, undoubtedly a household acquires rights to all land which it clears from the forest. That land then enters the asset base of rotational land that the household possesses. It is also clear that the rights incorporate a clear concept of rights of disposal because at least one Sebaung family is farming swidden this year which he bought from another household. Land is also inherited being apparently divided equally between all the children. The principles by which this division is made were not investigated.

Planting of permanent tree crops (including fruit trees) gives the planter rights to the produce of the crop. That person derives no greater right to the land on which the crop is planted than he or she formerly possessed. By planting the permanent crop, however, no one else can utilise the land until the permanent crop has been exhausted. While such areas as rattan and rubber gardens are planted in clearly demarcated areas, fruit trees often are not. Illipe nuts (tengkawang) are a good example. They are usually planted along the banks of rivers, sometimes in the forest and often in places abutting or in past swiddens. Any user of the land must be very careful to clear around the tree and avoid destroying it, especially when the field is fired. Rights to the crop are possessed by the planter and his or her heirs. The latter usually enjoy equal rights which seems to be the case with the Dohoi. In such cases, where a crop is particularly valued like mango or rambutan, a decision is made when to harvest the fruit and all those with an interest in it participate in the harvesting. How the Dohoi manage the inheritance of rattan gardens might be a different matter and needs to be investigated in the interests of effective long term planning. It is therefore recommended that the Project should carry out a brief investigation of Dohoi concepts of rights to land so that national park authorities are able to understand the application of the principles and are able to negotiate with the Dohoi over land matters from a basis of understanding.

### 3.2 Rice Farming

The vast majority of households in each of the survey villages have their own individual swiddens and farm annually. The percentage not farming is given in table 4 below. Interestingly, in Habangoi, the poorest household did not farm. It seemed to have reached a point where it was so in debt that it only had time to give labour to its creditors and had no time to farm itself. It was in a situation from which it will be very difficult to escape as the daily wage usually provided little surplus above the daily rice needs. In Malawan and Sebaung, two households did not farm as they devoted their energies

to trading rattan and ironwood shingles downriver. The other households not farming either owned or had access to chainsaws and were in a kind of lowly capitalised sawmill industry, cutting housing timber and selling it locally as well as hiring out their chainsaws to farmers.

**Table 4. Farming Strategies**

	Tumbang Habangoi	Malawan	Sebaung
	%	%	%
Swidden from primary forest	61.46	39.65	65.00
Swidden from secondary forest	33.33	47.31	30.00
Did not farm	5.21	13.04	5.00

Table 4 also shows the proportion of households clearing old and secondary forest for their swiddens. The majority appear to be embarking on a strategy of clearing either primary or very old forest for their swidden and then, after harvesting the rice, planting the area with rattan. Part of the strategy might be dictated by population growth, but this appears unlikely because both young and old households are equally likely to clear old forest. Certainly, the strategy is enhanced by the availability of chain saws which overcome the strict physical limitation on area imposed by having to cut down mature trees by axe or traditional adze. Chain saws are available to all families, who rent them from an owner to clear their fields.

The strategy is a surprising one. For one thing, the majority of Dayaks believe that good secondary growth provides far more reliable yields than primary forest. The problem with old forest is that the trees are very large and the consequent burn is usually disappointing compared with that of secondary growth where the lighter woods, the saplings and abundant dry foliage provide excellent tinder. One advantage of farming swiddens cut from old forest is that weed growth is less prolific than with secondary forest and usually requires only one round of weeding. Weeding is usually the limiting factor to the size of swidden. A household with a lot of adult women can usually farm a large swidden because it is the women's duty to keep the swidden free of weeds. Secondary forest usually requires two rounds of weeding. A swidden in its third continuous year of production, after a bad burn might even require three rounds of weeding.

The strategy has every appearance of being somewhat profligate, in that bigger swiddens are being opened on the basis of the lower requirement for weeding and, even then, it is quite likely that the weeding is not performed adequately. One bachelor in Habangoi, for example, had opened up a 4 ha. swidden with the help of a chainsaw. Being a bachelor he has no resources for weeding other than himself and one assumes the result will be a low yield but, given the size of the swidden, a sufficient supply of rice to meet his annual needs. Yields of swidden cut from forest are usually lower. What is particularly surprising is that, by planting rattan after the harvest, no benefit is taken of a second year of production either immediately after the first or after a break of three years when yields would be expected to be optimal. If this is a trend, it has potential consequences of some concern for the national park, especially in the cases of Malawan and Sebaung because it means that land requirements are increasing because of a sub-optimal approach to cultivation.

A second consequence of current strategies is that swidden are being driven further and further away from the settlement by the intervening rattan gardens which cannot be disturbed except to harvest the rattan crop. Rattan gardens go right up to the boundaries of the settlements of Malawan and Sebaung and are on land which appears to be satisfactorily fertile and would be much easier to manage as a swidden than one seven or eight hour's distant from the settlement. Again the strategy is sub-optimal for what is happening is that the land within easy reach of the settlement is being removed from the cultivation of the crop, rice, which requires most attention. Instead, it is being used for rattan which requires little attention at all other than when it is being harvested. Consequently, the crops which need the least attention are located close to the settlements and those which require the most attention are located furthest from them.

The dispersal of swiddens further and further from settlements has a further consequence which probably affects rice yields. Smaller and smaller household groups tend to farm contiguous areas which results in greater areas of boundary with the forest from which pests come to attack the growing rice. It also means that the population available to guard the fields is reduced which increases the likelihood that pests will gain undisturbed access to the field with consequent reductions in yields. It also opens up access to the growing rice to a much bigger population of pests. Farming in one consolidated group has the great advantage of minimizing depredations from mammalian pests. It has the disadvantage that disease is likely to spread further.

For the national park, with the most fertile land generally being located closest to rivers, it also means that swidden are probably being driven further and further upriver and deeper into the park. There is therefore a strong case to get the Dohoi to alter their farming strategies so that the most fertile land is set aside for

rice growing and other land is used for rattan plantations. Such a change would result in loss to the Dohoi, for households would have to cut growing rattan to develop their swiddens; so alternative cleared sites for plantations would need to be developed, a discussion of which will be taken up in the next chapter.

In the short time in the field during the period in which farms are fired and rice seed is planted, one could not help remarking certain aspects of Dohoi farming practises. The more successful Dayak groups co-ordinate their farming within the group very carefully. Part of the co-ordination is required by religious observances which require a whole group to perform a certain ritual at a certain time. Consequently, all farms are cleared and ready to fire at the same time. Households are more likely to farm in contiguous areas under such a regime. Households plant their rice at the same time. The rice ripens at the same time which means that aerial pests have only a limited period during which to satiate themselves. Among the Dohoi some households were still clearing their fields while others had already fired their's and were beginning to plant their rice. Quite apart from the risks that an over late start to clearing would result in missing the dry season, the later planters would extend the rice season markedly with the result that birds in particular and rats and other animals could extend their own feeding season of ripening rice.

A second observation, particularly where old forest was cleared, was that many of the branches of the big trees were not lopped with the result that the fire neither reached them nor their leaves. Nor were smaller trees cut to fall in such a way that they would form heaps which would smoulder for some time. Consequently, the available wood was not used as efficiently as possible to produce fertilizing ash.

Another job which the Dohoi do not appear to perform is to fence their farms to keep out large animals like pig and deer. Quite how effective the fences are is difficult to estimate, but most Dohoi named pig and deer as some of the most incessant and worst pests they had to deal with in their swidden. Erecting a fence around a field would certainly make it more difficult for pig and deer to enter into it. Channelling them down a narrow way could also lead them to traps and provide the farmer with fresh meat for very little effort.

Establishing rice yields from an interview situation is extremely inexact. The average farmer has only an imprecise idea of area and does not measure the harvest. He gets an idea of the harvest from the number of panniers of rice he takes back to his granary. Rough estimates can be checked against the daily intake of rice and the number of month's subsistence the harvest provided. Farmers can also be questioned about the size of their current fields which can be visually inspected, but the enumerator is often as poorly equipped to gauge distance as the farmer.

Mean size of swidden varied significantly between each village as shown in Table 5. There was a correlation between the number of households cutting down old forest and the size of farm. The greater number of persons farming in old forest areas, the greater the mean size of farm. This suggests that freed from the constraints on area imposed by the axe or adze, households were able to open up larger swidden from old forest whereas those working secondary forest were still constrained by the limitations imposed by the requirements for weeding. The assumption is also supported by applying a fairly crude labour availability test to the swidden area farmed, especially in Habangoi where size of swidden seemed greatest. Assuming that 365<sup>1</sup> persondays are required to manage one hectare of swidden, in Habangoi four (57%) of the households did not have sufficient labour available to manage their swiddens effectively and one further household was on the margins.

Table 5. Swidden Area

	Tumbang Habangoi	Malawan	Sebaung
Average swidden	1.53	0.89	1.27
Percentage clearing old forest	61.46	39.65	65.00

Rice yields also varied markedly. Households described last year as an average year. Malawan with the lowest percentage of households clearing old forest and the lowest average farm size achieved the highest yields. Habangoi, with the largest swiddens achieved the lowest yields. There was a high correlation between farm size and yield. The bigger the farm, the lower the yield supporting the notion that current strategy is tending towards opening up bigger and bigger swiddens from old forest in the expectation that the weeding requirement will be low and the big area will produce the volume required. Variations in yields were surprisingly high, suggesting that the chronically less successful farmers have a lot to gain from farming close by the more successful ones.

<sup>1</sup> Assumption is that for 1 ha. of swidden, 120 days are required for clearing; 1 for firing; 64 for planting (it ignores the planting of supplementary catch crops); 120 for weeding; and 60 for harvesting, threshing and winnowing. The figures seem conservative.

Table 6. Rice Yields<sup>2</sup>

	Iban	Tumbang Habangoi	Malawan	Scbaung
	Per ha.	Per ha.	Per ha.	Per ha.
Average yield	903	574	763	614
Minimum	482	211	150	62
Maximum	2588	1,406	1,915	2,124

Rice yields of the Dohoi are similar to those obtained by the Kantu in Kalimantan Barat, only the Kantu are farming secondary forest. Compared with the Iban farming climax forest in 1948, the yields are very disappointing, particularly given the fact that the Iban data was obtained during a very poor farming year. Not only are average yields only about 70% of the Iban figures, both minimum and maximum yields are also below the Iban figures as shown in table 6 above. Rather than what would be expected, the productivity of the land and yields have declined significantly over the past 40 odd years (while allowing for the fact that the comparison is between the 1990s Dohoi and the 1940s Iban). The figures certainly suggest that the Dohoi might not be farming their swiddens as efficiently as they might. The yields are also well below the Sikeda, a group in the Gunung Niut area of Kalimantan Barat who consistently obtain yields similar to hill rice farmers in northern Thailand and Laos as shown in table 7. The best reported yields obtained by the Dohoi rank with the very successful Yao. If such yields could be obtained regularly, then the requirements for swidden land would decline conspicuously.

<sup>2</sup> Calculations are largely based on the formula of daily intake of husked rice times months supply divided by a figure of .64 for the difference in weight between unhusked and husked rice. The figure of .64 is taken from measurements taken in Kalimantan Barat using litre jugs.

Table 7. Comparative Rice Yields

Group	Location	Yield Kg/ha
Bidayuh <sup>3</sup>	Sadong, Sarawak	244
Iban <sup>4</sup>	Engkilili, Sarawak	316
Habangoi	Bukit Raya	574
Sebaung	Bukit Raya	614
Kantu <sup>5</sup>	Kalimantan Barat	698
Mulawan	Bukit Raya	763
Iban <sup>6</sup>	Balleh river, Sarawak	903
Sikedu <sup>7</sup>	Kalimantan Barat	1,432
Sa Karen <sup>8</sup>	N. Thailand	1,435
Lahu <sup>9</sup>	N. Thailand	1,600
Lamet <sup>10</sup>	N. Laos	1,652
Yao <sup>11</sup>	N. Thailand	2,288

There is a marked difference in the success of rice farmers in the villages surveyed in Kalimantan Tengah compared with those in the earlier survey in Kalimantan Barat, which is surprising because forest access is better in Kalimantan Tengah as shown in table 8. Very few households in the Kalimantan Tengah harvested sufficient rice to meet their annual needs. Belsky found that the village closest to the forest, Riam Batang was able to supply all its basic subsistence needs from its rice fields. In contrast, the two villages which were least successful were located in heavily used land, much of which was exhausted and had been converted to alang alang grass. These villages compared closely with the most successful village in the Kalimantan Tengah survey, Habangoi (and we must treat these figures with circumspection given the small sample surveyed). The two villages closest to the national park were conspicuously less successful than the least well endowed villages in Kalimantan Barat. It seems that the Kalimantan Tengah Dohoi might have something to learn from their cousins on the other side of the border. It is therefore recommended that a careful survey of the different approaches to swidden farming be made and the differences

<sup>3</sup> Cramb. R. 1979

<sup>4</sup> Cramb R. 1979

<sup>5</sup> Dove M. 1980

<sup>6</sup> Freeman D. 1970 Report on the Iban

<sup>7</sup> Heppell M. 1980 Report on the Sikeda

<sup>8</sup> Nakano . 1980

<sup>9</sup> Walker . 1976

<sup>10</sup> Izikowitz . 1961

<sup>11</sup> Miles D. 1967

leading to greater success on the part of swidden cultivators in Kalimantan Barat be built into a program to improve success levels in Kalimantan Tengah.

Table 8 also lends credence to the likelihood that bigger swiddens are being farmed for volume and not for efficiency. Again there was a direct relationship between size of swidden and month's supply of rice, with Habangoi being most secure and Malawan least.

**Table 8. Household Rice Security by Village**

	Belsky Survey					Present Survey		
	Riam Batang/ Tumbang Taberau	Tanjung Pako	Tumbang Kaberau	Belaban Ela/ Sungkup	Nanga Siyai/ Nanga Apat	Tumbang Habangoi	Malawan	Sebaung
	%	%	%	%	%	%	%	%
% of households below rice security	0	15	40	83	80	75	91	87
% of households above rice security	100	85	60	17	20	25	9	13
Average number of months' supply						Months 6.43	Months 5.35	Months 5.53

The year surveyed does not appear to be unusual. It is regarded as being average. Table 9 shows the number of years in the last ten that households report that the harvest has met their annual subsistence needs. In Malawan, 30% report that it never does, which does call into question the farming methods used or the choice of land. The figures suggest that Habangoi is more successful than Malawan and Sebaung, but caution needs to be exercised with these figures. Few households in any of the villages can expect to meet their subsistence needs more than every other year and most do worse than this.

**Table 9. Frequency Households Obtain Rice Self-sufficiency**

	Tumbang Habangoi	Malawan	Sebaung
	%	%	%
Never	12.5	30.0	6.7
1	0.0	5.0	13.3
2	0.0	10.0	0.0
3	12.5	30.0	20.0
4	0.0	15.0	26.7
5	25.0	5.0	20.0
6	25.0	0.0	13.3
7	0.0	5.0	0.0
8	25.0	0.0	0.0
9	0.0	0.0	0.0
Every Year	0.0	0.0	0.0
Average	5.1	2.5	3.6

Month's supply of rice obtained also follow the size of swidden, both in the results obtained over the past 10 years and in the 1992 crop. The results enable the following statement to be made: **the greater the number of households clearing old forest; the bigger the swidden; the greater the crop; and the lower the yield** as illustrated in table 10 below. The figures would encourage the people of Malawan to change their strategy from predominantly farming secondary forest to the more profligate approaches of the people of Habangoi and Sebaung. Such a change would have immediate consequences both on the supply of old forest in production forest and also, probably within the boundaries of the national park.

**Table 10. Comparison of Swidden Strategies, Supply and Yield**

	Tumbang Habangoi	Sebaung	Malawan
Percentage clearing old forest	61.46	65.00	39.65
Average swidden (ha.)	1.53	1.27	0.89
Month's supply	6.43	5.53	5.35
Average yield (kg. per ha.)	574	614	763

On average, the households that farmed in the Kalimantan Tengah survey met about half their annual needs for rice from their fields. Requirements for the remainder of the year were purchased rather than switching to less tasty alternatives like cassava. Those households that did not farm purchased all their annual requirements. Consequently, more than 50% of the annual intake of rice in Habangoi, Malawan and Sebaung was purchased, as shown in table 11. This means that there is a powerful impetus to earn money to make up any deficiencies from the swiddens. Again, the difference between the Kalimantan Tengah figures and the Kalimantan Barat figures is stark. In the latter, in all but one of the villages less than 10% of the intake was purchased. In three villages absolutely no rice was purchased, which is most unusual, particularly in Tumbang Kaberau where 40% of the population did not achieve rice security.

Table 11. Major Sources of Basic Subsistence

	Belsky Survey					Present Survey		
	Riam Batang/ Tumbang Kaberau	Tanjung Pako	Tumbang Kaberau	Belaban Ela/ Sungkup	Nanga Siyai/ Nanga Apai	Tumbang Habangoi	Malawan	Sebaung
	%	%	%	%	%	%	%	%
Rice from swidden	100	100	100	75	20	47	33	43
Rice from sawah	0	0	0	17	40	0	0	0
Rice purchased	0	0	0	8	40	53	67	57

An interesting question when considering future economic activities of the communities living around the national park is the return households are getting for their labour inputs into subsistence production. Where alternatives are available which produce better returns and the subsistence can be purchased without difficulty, a good case can be made for switching activities. Taking the year surveyed which most respondents regarded as average (one must remember when considering economic alternatives that every subsistence rice farmer expects the current year to be excellent), and assuming labour inputs of 365 days per annum are required to manage one hectare of swidden effectively, returns are very low. The average return of between Rp.1,004 and Rp.1,489 per day compares very unfavourably with the lowest minimum daily wage of Rp.5,000 offered in the village or in the local timber camp. The highest daily return was Rp.3,713 which is still significantly less than the return for a day's casual labour in a timber camp. The least successful farmers obtain such a poor return that there seems an

unassailable economic case for their seeking better economic returns for their labour in some other economic activity.

Table 12. Daily Returns for Labour Inputs to Swidden

	Tumbang Habangoi	Malawan	Sebaung
	Rp.	Rp.	Rp.
Mean Daily Return	1,004	1,489	1,074
Maximum Daily Return	2,459	3,348	3,713
Minimum Daily Return	369	262	109

Rice is susceptible to the normal range of pests and problems found in Kalimantan. The major pests are pig, deer, monkey (kera), rat (tikus), sparrows (pipit) and insects such as the stemborer, a black insect, one which attacks the roots and grasshopper. The major disease appears to be a rust or fungus which attacks the young rice, turning its leaves yellow before they wither. The majority of Habangoi households considered that the land was not particularly fertile and also complained of weed growth being a major problem. Other problems mentioned were drought, rapid bush regrowth and ants nesting in the roots of the rice crop. For the majority of households, the most serious problem is disease because there are no remedies.

One surprising thing about the rice grown in the survey villages was the limited number of varieties planted. Few households planted more than six varieties, which is far fewer than other Dayak groups. Whether or not the Dohoi possess the same range of disease resistant strains is not known. A list of the varieties of both normal and glutinous rice is given in Appendix 4. Given the need to raise yields and, consequently, reduce swidden areas, advice should be sought on the rice strains planted by the Dohoi and, if appropriate, their stock should be expanded with more vigorous varieties of dryland rice.

Swiddens are also an important source of vegetables for the household cooking pot. A preliminary list of vegetables sown is given in Appendix 5. How good vegetable crops are generally was not investigated in the survey. Either just before or just after sowing the rice, a variety of vegetables are planted in the swiddens, most of which mature before the rice is harvested. Principal among the vegetables are maize, cucumber, peppers, spinach, brinjal and

pumpkin. Also planted are sugarcane and cassava. Sugarcane is not processed into red sugar and used as a substitute for purchased refined sugar, the latter being a major item of household expenditure. Cassava is planted on the periphery of swiddens and left there. Given that the swiddens are usually only used once, the cassava is quickly overrun by regrowth and both anecdotal evidence and observation indicated that, for many households, it is in short supply.

Many households reported a dearth of vegetable seed. Many did not possess, for example, watermelon and tomato seed. They therefore did not sow these fruits. They had no answer to the question of why they did not borrow or beg seed from those households which did possess them. **The Project could make a major impact on the variety and range of vegetables planted in swiddens by distributing, before the next rice season, hardy seed not obtainable in the villages. A preference should be made for vegetables which have no sophisticated cultivation requirements.**

Few Dohoi cultivate vegetables in any intensive way in a local backyard or small garden. For one thing, the forest yields all sorts of vegetable food. It is a lot easier simply to go into the forest and forage for vegetables than to do all the necessary, hard and repetitive tasks to manage a small vegetable garden. The cost of purchasing fertilizer is a sunk cost because there is no opportunity to sell the produce. Hence, growing vegetables for a surplus, with the exception of Habangoi, has no value whatsoever because there is no market for the surplus. Habangoi does have access to a local logging production camp where vegetables are bartered for sale. The market, however, is small. There is one monopoly buyer. The vegetable growers, consequently, have little bargaining power.

### 3.3 Permanent Crops

There are three kinds of permanent crop: fruit trees, production crops and experimental crops. Fruit trees have been planted from time immemorial; production crops (rattan) are relatively new have only been planted seriously in the last 10 years; and experimental crops are those where government has provided seed or seedlings and local households have planted the seedlings just to see how they would go. There is no Dinas Perkebunan extension service in the locality. Seedlings have included coffee, rubber and cocoa which have all grown. In the case of the latter two, there has been no follow up in terms of communicating the skills required to harvest them; so they are simply left to grow. There is probably no local market for the produce. Seedlings have also included pepper, which were planted but, according to local households, the leaves of the seedlings were already yellow when they were received and they quickly died. Simply providing seedlings without ensuring that there is a market for the produce and without following up the supply with an educational program to demonstrate how they should be cultivated

and harvested is a risky way of trying to introduce new cash crops to an area and expand a village's resource base.

Fruit trees are planted in four areas (a list of fruit trees cultivated is given in Appendix 5). They are planted close to the family house in the settlement, around a farm hut and on the fringes of swiddens, in old fruit groves and, in the case of illipe nuts, along river banks. The Dohoi of the Habangoi and Heran rivers do not ring their settlements with fruit groves. There were few fruit trees close to settlements; rather, as was the case with Malawan and Sebaung, rattan gardens abutted the settlement. Consequently, households do not have ready and constant access to fruits such as papaya and banana which are excellent supplements for a healthy diet. The explanation for not planting such fruit trees is that the seedlings would be eaten by roving pigs. In all settlements, most pigs were corralled. In Habangoi, piglets were able to escape through the bamboo fencing and roam at will. In Malawan and Sebaung, one household did not corral its pigs and, much to the annoyance of everyone else, they roamed freely throughout the settlement. One pig roaming free is enough to frustrate all efforts at planting fruit trees close to a settlement. The Kayan of the Apo Kayan river in Kalimantan Timur approach this problem by locating their domestic pig on the opposite side of the river from their settlement and feeding them late in the evening. Other Dayaks with access to markets buy wire fencing. There is a need to deal with the problem of roaming pigs before any project to increase the availability of fruit is undertaken close to the settlements.

The fruit stock could well be expanded which would contribute to the health of the people. Very few households planted papaya and only one variety seemed to be grown. No households planted any citrus. Very few planted mango and again it is doubtful that more than a couple of varieties are owned. While rambutan are grown, it is also doubtful that they are the prolific varieties. For a very small outlay, the Project could enhance the stock of fruit trees available to settlements close to or in the Bukit Raya National Park by providing them with seedlings of a range of varieties. The provision of seedlings should be linked to a community based project to enhance the availability of fruit close to the settlement.

The major permanent crop is rattan. Two species of rattan are planted. The most popular is uwoi sega. Uwoi tumbang is also planted. As mentioned earlier in this chapter, the current cultivation strategy of the Dohoi is to plant rattan in swiddens either just before the crop is harvested or just after. The rattan is not planted systematically throughout the swidden. One limiting factor is the availability of seed which is harvested from other rattan gardens or from the forest. There is also great variation in the number of rattan seedlings in a given area, with the range per hectare being between 30 and 250. On average, about 100 holes are planted, with each hole receiving between three and five seed. From discussions, the most efficient use of the land would have about 200

holes being sown. There is no history of fertilizing the growing seedlings. Clearing around the area where new sowings have been made is perfunctory. Usually, the rattan is simply left to grow.

Rattan was not being harvested enthusiastically as households complained of the low current prices. In Habangoi and Sebaung, however, the majority of households did harvest rattan as one major source of income as shown in table 13. In Malawan, in contrast, the major activity was not in rattan, where only 30% of the population reported income from the crop.

**Table 13. Percentage Farming and Returns from Rattan**

	Tumbang Habangoi	Malawan	Sebaung
	Rp.'000	Rp.'000	Rp.'000
Mean Return per household	552	450	470
	%	%	%
Percentage Farming	75.00	30.63	75.00

Compared with swidden farming, the economics of rattan production appear very good. What is not known and what would have to be determined is the size of the market given current government restrictions on the export of rattan and the monopoly supply and how quickly market demand would be satiated. Table 14 presents projections of costs and returns from a one hectare plot of rattan returning a harvest of 148.33 pikul every 8 years. How realistic these figures are and the assumed times for each part of the process should be checked with experts. Prices are based on reported current prices reigning in Malawan and Tumbang Samba, locally estimated prices in Banjarmasin and local estimates of time to perform each part of the process.

Rattan returns a daily rate about six times greater than the swidden taking the best daily return of Rp.1,513 of Habangoi. A family of four just selling wet rattan would get an annual per capita income of Rp.830,000 from 180 days work of the two adults which would be twice current per capita income levels. Cutting out the middle man to Tumbang Samba increases the difference to seven times and provides work for almost double the number of people. On the downside, rattan processing is very boring work and would rank with weeding the swidden for onerousness. Nor does rattan have any religious backing.

The figures tentatively indicate that some kind of local co-operative venture basis of collecting and processing rattan for sale in Tumbang Samba could provide good returns for the people participating. There would be opportunities for optimizing profit and for minimizing costs. Some kind of long shed would enable processing of the rattan to be performed on a production line basis. It would also protect the dried rattan from the rain, which is a significant risk under current methods of simply covering the dried rattan with tarpaulins should rain threaten. Some kind of commercial arrangement with the local timber concessionaire should also enable larger loads to be trucked to Tumbang Samba at a much lower unit cost (local kelotok can only take 10 pikul per trip and the risks of the rattan getting wet on the river are great). Quality control could be exercised on the rattan so that the price received would not be adjusted for anticipated unusable lengths. If the economics and logistics justify it, eventually the processing could produce lengths of the appropriate quality for sale directly to Banjarmasin or similar major marketplace. This argument will be taken further in the next chapter.

The figures in table 14 suggest that in planning for the national park a tentative area of 8 ha. per household might be set aside for rattan production based on 8 1 ha. blocks being harvested once every eight years. The total area could be less, reflecting the additional labour requirements required should a local processing industry be established. The total area could quite conceivably be in production forest.

**Table 14. Rattan Returns from a One Hectare Plot**

	Rp.'000	Rp.'000	Person Days	Daily Return Rp.
<b>A.</b> Wet Rattan Sold Locally by Smallholder @22,500/pikul		3,338	356	9,375
<b>B.</b> Rattan Sold in Tumbang Samba:				
Old Length	8,140			
Young Length <sup>12</sup>	<u>1,447</u>	9,587		
<u>Costs</u> - Drying	148			
Haulage	<u>2,670</u>	<u>2,818</u>		
Net Return		6,769	628	10,773
<b>C.</b> Rattan Sold in Banjarmasin:				
Prime Length	7,537			
Second Length	10,552			
Young Length	<u>2,895</u>	20,984		
<u>Costs</u> - Costs from B	2,818			
Assumed Additional Costs <sup>13</sup>	<u>5,000</u>	<u>7,818</u>		
Net Return		13,166	928	14,187

### 3.4 Land Requirements

Assuming an 8 ha. rattan garden and that current swidden sizes will not be altered and would be farmed on a seven year rotational cycle, current area required for farming purposes is given in Table 15. More efficient and productive swiddens would, however, reduce the requirement. An extra 2 ha. of estate crops is allowed for because it would not be sensible economic planning to have the communities living around the park dependent on only one crop. The down side of expanding alternatives is that, given labour requirements for collecting, processing and transporting rattan, there would be very little time available for tending alternative estate crops.

<sup>12</sup>. A length of rattan is assumed to be 41 metres divided between 25 metres of old and 16 of young.

<sup>13</sup>. The costs are based on figures given by a trader in Malawan. How realistic they are has not been verified. Prices received would be discounted as, currently, short useless lengths are put in the middle of bundles to increase the weight. Presumably there would be a further loss on cutting. The costs of transport from Tumbang Samba to Banjarmasin is a guesstimate. The guesstimate, hopefully, is on the conservative side. The figures, however, need to be checked.

The area required, effectively, would be doubled in 20 years given the present rate of population increase being maintained. On the other hand, if the figures for rattan are realistic and processing could be extended to delivering a quality product downriver, the requirement for swiddens would dwindle while the requirement for rattan gardens would double. If rattan is incorporated into the forest production cycle, the doubling of the population would place few additional pressures on the land available.

Providing sawah fields for wet rice cultivation would reduce land requirements significantly. **Opportunities for sawah cultivation should be investigated.** The land above Sebaung appeared reasonably flat and there is one area currently being farmed just below a rapid which might offer the possibility of irrigated rice using the fall in the river to pump water into the sawah. Should the Dohoi be able to meet most of their subsistence needs from wet rice cultivation, the requirements for swiddens would be eliminated. The introduction of wet rice farming would require a major community development program for the technology required is markedly different from that employed in swiddens. Careful planning would be required to ensure that an alternative is found to the swidden vegetable production.

Should such a program be undertaken, the project should target the households of community leaders interested in joining the project and younger households. The community development project would have to determine the relative long term benefits of opening up the sawah using mechanical equipment or using only local labour. The social survey in the Bukit Baka area indicated that once some households had benefited from sawah being opened up by tractors, other households were unwilling to invest time in the laborious work of levelling land for themselves by hand. The situation is likely to be replicated in Kalimantan Tengah. One guiding principle might be that if there is an area large enough to accommodate all current households especially in Malawan and Sebaung, then there probably would be advantages in levelling the land by tractor (with the major proviso that negligible damage must be done to the topsoil). Otherwise it would be better to do it by hand, or by using a motorised hand plough or a cattle drawn plough.

Table 15. Current Area Required for Agriculture

	Tumbang Habangoi	Malawan	Sebaung
Average swidden	1.53	0.89	1.27
Average rattan garden	2.04	2.01	4.48
Swidden requirement	1,028	231	178
Rattan garden requirement	768	296	160
Other estate crops	192	74	40
House yard	48	19	10
Total	2,036	620	388

### 3.5 Ironwood

Ironwood is a rapidly diminishing resource within easy reach of swiddens or settlements. The figures from Habangoi should be treated very cautiously because it must be reiterated that those surveyed were not those living in their swidden huts distant from the settlement. At Malawan and Sebaung, it is estimated that there is now only about two year's supply within easy reach of swiddens or the settlement. Already, it is estimated that stands of ironwood are 4 kilometres away from swiddens. In Malawan ironwood shingles account for 70% of the total cash income of all households excluding the two trading and in Sebaung 48%. In the two villages, ironwood shingles contribute almost Rp.1 million to each household's annual cash income as shown in table 16. If predictions of the diminishing availability of ironwood are correct, then in two year's time some alternative source of income will have to be found if the communities of Malawan and Sebaung are not to find themselves in dire economic straits or, alternatively, seek another source of supply which might take them increasingly into the national park.

Table 16. Percentage Working and Returns from Ironwood Shingles

	Tumbang Habangoi	Malawan	Sebaung
	Rp.'000	Rp.'000	Rp.'000
Mean Return per household	375	937	975
	%	%	%
Percentage Farming	12.50	81.48	75.00

The daily return on making roof shingles, on the surface appear good. From a felled tree, a person can make a daily 4 ikat (a bundle of 85 shingles) which can be sold in Malawan or Sebaung for Rp.3,200 suggesting a daily return of Rp.12,800. The figures are illusory, because it takes another day to transport the shingles for sale reducing the daily return to Rp.6,400 and making it compare unfavourably with rattan. They are also an optimal price, for a pack of shingles sells for anything as low as Rp.2,500 depending on its quality. Transport will further erode the daily return as ironwood trees have to be located further and further away from the settlement or from swiddens as they become more and more scarce. So long as swiddens keep expanding into areas where ironwood is abundant, making roof shingles is attractive because it can be done while others are working in the swidden or towards the end of the day once work has been completed and thus provide necessary additional income. This opportunity might be another reason why there appears to be a strong preference for opening up swiddens in old forest areas.

The downstream daily returns on a co-operative venture company are also less attractive than for rattan as shown in table 17. In fact, the downriver daily return in Palangkaraya is less than the present day local daily return on a day's work bringing rattan for sale in the settlement. They are even less attractive when a value is placed on conservation.

**Table 17. Ironwood Shingle Returns (based on 600 packs)**

	Rp.'000	Rp.'000	Person Days	Daily Return Rp.
<b>A.</b> Shingles Sold Locally @3,200/pack		1,920		
<u>less:</u> Rent of Chainsaw		<u>60</u>		
Net Return		1,860	300	6,200
<b>B.</b> Sold in Tumbang Samba @4,500/pack		2,700		
<u>Costs</u> - Costs from A	60			
Haulage	<u>180</u>	<u>240</u>		
Net Return		2,460	309	7,961
<b>C.</b> Sold in Palangkaraya @6,000/pack <sup>14</sup>		3,600		
<u>Costs</u> - Costs from B	240			
Haulage	<u>500</u>	<u>740</u>		
Net Return		2,860	324	8,827

The economics argue strongly for a switch from making ironwood shingles to collecting rattan. Male preferences might be another matter. The conservation argument for the village also is persuasive. Many households have yet to build a permanent residence in the village. With the rapidly increasing population, there will be an even greater demand for building materials. Conserving ironwood for local consumption, therefore, appears to have a persuasive appeal. An unknown is how much competition there is for ironwood between villagers and timber concessionaires. So long as villagers perceive timber concessionaires as taking the available ironwood for bridges and other uses, they are likely to take advantage of local stands of ironwood for their own economic benefit on the assumption that if they do not, the timber concessionaire will.

<sup>14</sup>. The retail sale price of a pack in Palangkaraya is Rp.6,500 per pack. The figure of Rp.6,000 per pack is an estimate and assumes what seems to be a reasonable profit for the retailer. Costs to transport the shingles to Palangkaraya are guesstimates.

An interesting fact for a social forestry component in the current project is that one household has started a small ironwood plantation. It is not in Malawan/Sebaung territory, but in Kalimantan Barat. The person is one of the immigrants using a chain saw to earn the money necessary for his household's daily requirements. This household, which is popular, might be a ready advocate for starting mixed local plantations of timber.

### 3.6 Comparison of Economic Returns of Rice, Rattan and Ironwood

In summary, table 18 below compares the relative returns for a day's labour of rice, rattan and ironwood shingles. It provides solid testimony to the competitive advantages of rattan production, especially when the local production includes harvesting, processing and transport to the local sales point. At this point, daily returns are 724% of rice production and 135% of ironwood shingles.

**Table 18. Relative Returns of Rice, Rattan and Ironwood Shingles.**

	Sold Locally	Sold Downriver	Sold in Ibu Kota
	Rp.	Rp.	Rp.
Rice	1,489	1,489	1,489
Rattan	9,375	10,773	14,187
Ironwood Shingles	6,200	7,961	8,827

### 3.7 Other Forest Products

The forest and rivers bisecting it provide an abundant resource for local Dohoi. For food, they are used for fishing, hunting and foraging. The forest provides a varied resource for local medicinal purposes. It also provides economic opportunities such as panning for gold, cutting timber for local use, resins for sale and others.

Appendix 6 gives a list of the fish and animals hunted, the vegetables and fruit foraged, the wood used for building purposes and the flora used for purposes like medicine, dyes for weaving and poisons for fishing. It cannot be emphasised enough the importance of the forest both to the local Dohoi diet and wellbeing but also as an important resource for a number of small economic activities. The forest also acts as a kind of insurance policy. In times of real

hardship, the Dohoi will also be able to obtain enough subsistence from the forest to survive.

There are no specific seasons for accessing the forest, other than fruiting seasons for fruit. Fishing is at its most successful during dry spells when the rivers are low. When they are in flood, little fishing is done for fear of driftwood getting caught up in nets and ruining them or simply not being able to withstand the torrent and breaking loose and being lost. Both men and women fish. Men generally use fixed and casting nets and hook and line while women seek the smaller fish using baskets and mats. The poisoning of subsidiary streams is sometimes done - usually before a festival to ensure that there is sufficient garnish for the guests. Poisons used are natural ones which usually only stun the fish. Dayaks, however, are not in the habit of throwing young fish back into the stream. Chemical poisons and explosives are not used. The variety of fish is rich. Large fish are caught - a 6 kg. *ikan sapan*, for example was caught during the socio-economic survey. To maintain the resource will be an important objective of national park management.

Hunting is done throughout the year. It is at its most successful during the fruit season and particularly when illipe nuts are in fruit. Bearded pig is the primary prey. Tortoise meat, however, was most in evidence during the period in the field. Hunting parties will usually kill any animal considered edible which they come across in the forest. Orangutan are not eaten. Pig and deer are the favoured meats. Hunting is either done with dogs and spears or with air rifles. Shot is poisoned with a concoction of balsam and lime. Men are the principal hunters, though women do join in from time to time. Catches do not appear great. In the period the survey was in the field, no large animals were caught, though pig was certainly spotted and one was wounded which does suggest numbers are low as the period was at the end of one of the main fruiting seasons.

Local ponds created by roads being cut through small valleys are now also being used to harvest meat. In particular, one person in Habangoi has located a pair of turtle in one of the ponds near the settlement. **Opportunities for farming such areas are good and might well be investigated in a community development program.** Being on a timber road might also mean that the timber camps could provide a ready market for the produce.

Panning for gold provides a useful supplement to household income. It is only done during dry spells when the rivers are low. It also has a high probability of reasonable success. It is done by women, usually in small groups. A group of three or four would normally expect to pan about two grams of gold in a day, the proceeds of which would be shared equally. Gold fetches about Rp.18,000 per gram.

Other products are not sought systematically. Gaharu is not specifically collected because stocks are virtually exhausted. There appears little honey in the area. Resins like damar, getah and jelutong are collected but usually for domestic purposes like sealing boats. Though there appears to be limestone country in the national park, birds nests do not appear to be harvested systematically.

### 3.8 Animal Husbandry

Virtually every family possesses livestock. Poultry and pigs are the most common livestock. Average holdings are given in table 19. Poultry and pigs have a dual purpose. They not only provide food at festivals. They also have an important ritual purpose. Their blood is used to purify participants in the ritual activity and also to provide sustenance to protective spirits like house spirits, guardian spirits and rice spirits. The pig's liver also plays an important part in religious activities being used for the ancient art of hepatomancy, by which people are able to deduce the future.

**Table 19. Livestock Holdings**

	Tumbang Habangoi	Malawan	Sebaung
	No.	No.	No.
Pig	2.9	1.4	2.0
Poultry	10.3	5.1	9.2
	Total No.	Total No.	Total No.
Cattle	3	10	3
Duck	0	4	0

Livestock is basically husbanded for festivals. Occasionally, a rooster is sold to a visitor. Cattle are also sold when someone comes upriver to purchase. There is no attempt to sell bullocks as soon as they mature. The four duck owned by one household are curiosities. Three are battery produced and, therefore, infertile and the fourth is a lone Malay duck. Duck and poultry roam free. Most pigs are corralled except for one household's which are beginning to risk their lives every morning as they set out on their travels.

The cattle have all been purchased. Most are also tethered, though three roam free. One of these was recently speared by an outraged householder when it started to graze on his vegetable plot and carries a large ulcerating wound as testimony. At the end of the dry season, all the cattle appeared to be in good shape. The local population possesses no understanding of lucernes. If the cattle population is to increase significantly, particularly if they are to be used as part of a wet rice cultivation system, lucerne bushes should be introduced to act as a fodder supplement.

No goats are owned in the survey villages. Downriver, in the timber camps, goats are husbanded. For the purposes of park management, it might be advisable to discourage goats as, if they become feral, they could represent a major threat to park flora.

Dohoi swidden farming produces a self-imposed limit on the number of livestock a household can own. Most households spend long periods at their swidden without returning to the village. Consequently, they have to take their livestock with them where they roam free. Consequently, pigs tend to be slaughtered as soon as they are too heavy to carry. The number of poultry is also limited to the number which can conveniently be carried or be taken in a small boat.

Taking livestock to swiddens has one advantage. As with most villages in Kalimantan, Dohoi poultry is annually ravaged by Newcastle's disease. Frequently, the epidemics virtually wipe out the whole chicken population. By taking poultry to swiddens, there is a much greater chance that a number of households will avoid the epidemic and a basic stock of poultry remain for the village. The same is true for pigs, though the epidemics seem less severe. On the down side, households complained that their poultry and piglets were prey to hawks, eagles and other predators. There is no Dinas Peternakan office in the kecamatan; so there is little householders can do with disease other than to hope the invalids will get better.

Most households also own hunting dogs. Rabies entered the area in 1990 and each village surveyed reported that they had rabid dogs. The problem seems to have been overcome as the government acted very promptly and injected all dogs. Since 1990, none of the villages have reported any further outbreaks. The onset of rabies in inland areas of Kalimantan will undoubtedly have implications for the national park.

### 3.9 Income and Expenditure

Table 20 shows the distribution of the value of production in the villages surveyed. The figures for Habangoi are undoubtedly distorted by the fact that only people living in the village were surveyed and the sample included a number of people who sold rattan products like baskets and mats and vegetables to a local timber

production camp. It seems reasonable to assume that the households living in their swiddens would have different sources of income.

**Table 20. Distribution of Value of Production**

Production	Tumbang Habangoi	Malawan	Malawan (excluding traders)	Sebaung
	%	%	%	%
Rice	25.2	13.3	23.6	23.4
Roof Shingles	2.4	30.3	53.6	36.6
Rattan	21.2	5.3	9.3	17.6
Gold	0.1	1.0	1.7	8.6
Other	51.1	50.1	11.8	13.8

The figures show the importance of ironwood shingles to the household budget in Malawan and Sebaung. Without this income, households would not be able to meet their domestic expenditure requirements and would also not be able to purchase the rice they require once the harvest has been consumed. Rattan, despite its returns, is substantially less important than roof shingles in Malawan and Sebaung. The basic subsistence activity which for most households consumes about 8 months of their labour (67% of the year) only contributes about 23% of the income of Malawan and Sebaung. In Habangoi, it produces a quarter. Gold is insignificant as an income earner.

The figures compare starkly with those in Kalimantan Barat as shown in table 21. The most interesting comparison is between the Kalimantan Tengah villages and Riam Batang, the village closest to the old forest in the Belsky survey. Rice and rattan account for 70% of its income compared with only about 25% in the Kalimantan Tengah villages (Malawan would be greater than shown if trading profits were discounted). What is surprising in the Belsky survey is that the further the village is from the forest, the more important the forest is to its income. Tumbang Kaberau, Belaban Ela and Nanga Siyai are increasingly distant from the forest and yet forest products are the most important source of income (in Tumbang Kaberau's case equally with rice). In Malawan and Sebaung, forest products account for over 50% of the income of the great majority of households. The case of Habangoi must remain open as the survey did not reach those households farming distant swiddens. Secondly, it seems that at least some households in the Kalimantan Tengah survey are more enterprising than their cousins in Kalimantan Barat because they have chosen to do some trading and use that as a source of income. It suggests that there might be the leadership and

entrepreneurial zeal which would help projects get off the ground and be implemented successfully. In Kalimantan Barat, presumably, traders come up to the villages.

In the Kalimantan Tengah villages, wages are those of the village administration like the kepala kampung and sekretaris and the school teachers. No one in the survey received wage income from a timber concessionaire. Some households received local wages assisting traders prepare rattan for transport downriver and for working in other household's swiddens.

Table 21. Major Sources of Household Income

	Belsky Survey					Present Survey		
	Riam Batang/ Tumbang Taberau	Tanjung Pako	Tumbang Kaberau	Belaban Ela/ Sungkup	Nanga Siyai/ Nanga Apat	Tumbang Habangoi	Majawan	Sebaung
	%	%	%	%	%	%	%	%
Rice/Rattan	70	79	50	25	33	28.4	7.3	23.1
Forest Products	25	0	50	33	40	10.8	41.8	51.3
Wage Labour	4	7	0	33	13	5.6	4.7	11.5
Vegetables/Fruit	0	14	0	8	13	3.7	0.2	0.1
Trading						22.0	41.9	2.0
Handicraft						29.5	0.2	0.8
Gold Panning							1.3	11.2
Other							2.6	

There was little variation in average household expenditure between the three villages as shown in table 22. Low expenditure is no index of disenchantment. Households with older parents or those whose children were all adult and married tended to have very low expenditures and very low requirements. Salt, kerosene, a little sugar and coffee was all that was required in addition to the purchase of rice when the household stocks had been exhausted. The poorest families had to cut their cloths to match their incomes and, necessarily, had to do without a number of things they might otherwise have purchased. In most households, the biggest items of expenditure were rice, sugar, cigarettes, kerosene, clothes and household utensils. Most households kept expenditure and income roughly in balance. Most purchases were made on credit with the local trader, with subsequent sales of rattan or ironwood shingles being set off against the debts. Indebtedness was usually capped at about Rp.400,000, with most households admitting to debts in the vicinity of Rp.100,000. The only account examined was a household which had just sold 137 packs of ironwood shingles for Rp. 430,000, thereby reducing its debt with a local shopkeeper from Rp. 747,000 to Rp. 317,000. Debt, therefore can be quite significant and binds a household into buying and selling with one particular trader. Income

surpluses were frittered away either by children or purchasing some luxuries on an infrequent visit to the local market town or to Tumbang Samba or on locally purchased building materials either to build a new house or to improve an existing one. Households generally do not strive to generate surpluses. They produce what is required to meet their normal expenditure patterns. Occasionally, these are increased when a household decides to invest in some capital item, the most usual being a reasonably substantial house. Hardly any households had any form of savings other than old heirlooms which had been passed down to them.

Table 22. Annual Household Expenditure

	Tumbang Habangoi	Malawan	Sebaung
	Rp.	Rp.	Rp.
Average	1,217	1,155	1,391
Maximum	2,139	2,088	3,079
Minimum	289	210	434

Rice is by far the biggest item of expenditure, accounting for between 25 and 35% of all expenditure as shown in table 23. Clearly, ensuring basic subsistence would reduce household needs for income significantly and, therefore, of cutting down mature ironwood trees to generate that income. When the value of rice produce is added to purchases, rice accounts for about 50% of consumption. The central importance of rice in the economies of the Dohoi can receive no greater testimony. In the short term, the most attractive investment for the Dohoi would be security of rice production. Such security would enable alternative sources of income like rattan gardens to be developed without undue pressure to produce instant earnings to cover rice shortfalls. If sawah is feasible, a project to develop it would produce the rice security and at the same time reduce the need to open up new land.

**Table 23. Rice as a Percentage of Purchases and Consumption**

	Tumbang Habangoi	Malawan	Sebaung
	%	%	%
Purchases	26.8	37.2	31.4
Consumption	47.9	57.3	48.7

The Dohoi villages of Malawan and Sebaung are classified (as are most villages in the district) as poor (kemiskinan). Average family sizes are between 5.3 and 6.1 per household as illustrated in table 24.

**Table 24. Average Family Size**

	Tumbang Habangoi	Malawan	Sebaung
Average family size	5.38	5.33	6.19

The impacts on individual poverty of large family sizes are well illustrated in table 25 below. Average annual household incomes hold up quite well, averaging between 1.5 and 2.5 million (and probably a little over this given the propensity of informants to understate income levels). An average family size of four would raise per capita incomes of Habangoi and Sebaung to around the half million mark.

The question of where to draw a poverty line in Indonesia has been discussed by Anne Booth<sup>15</sup>. She compares the Indonesian line with those in Thailand and Philippines and demonstrates that the Indonesian poverty level starts at a much lower rate than in either of the two other countries. Taking the BPS 1990 figure of Rp. 13,295 per month and discounting it for inflation would produce a poverty level in the region of Rp. 200,000 per annum. At this rate, about 25% of the population in this study would be classified as poor. Increasing the rate to Rp. 365,000 (equivalent to one kilogram of rice per person per day) would result in just over 50% of households falling below this level. Per capita incomes are well below the national average of Rp. 1.2 million. The poorest household in each

<sup>15</sup> Booth, Anne Counting the Poor in Indonesia in *Bulletin of Indonesian Economic Studies* 299:1 1993

village was very poor indeed. Despite this, none of the people (other than one household in Habangoi) exhibited any signs of extreme poverty. There is no lack of food. Diet is reasonable. Needs are modest.

**Table 25. Average Incomes**

	Tumbang Habangoi	Malawan	Malawan (- traders)	Sebaung
	Rp.'000	Rp.'000	Rp.'000	Rp.'000
Per household	1,953	2,519	1,538	1,999
Per capita	363	472	300	323
Maximum per capita	604	2,467	920	1,018
Minimum per capita	75	38	38	107
	%	%	%	%
% of households below Rp.200,000 per capita.	25.0	22.5	24.3	25.0

### 3. 10 Capital Goods

The Dohoi of Habangoi, Malawan and Sebaung are still basically subsistence farmers. Their needs for cash income are based on meeting their daily household needs which now include, in addition to rice, such things as sugar, cooking oil, coffee, cigarettes, salt and the like. While people generally noted a community television and electricity as two things they would like to assist in the development of their settlements, there is no desire to own individual sets; nor radios, watches and the like. Needs remain simple other than for the major investment that most households will make, and that is to construct a reasonably substantial house with planked flooring and cladding and a wood shingle, roof. Income surpluses, after meeting the expenses of any children downriver at the SMP secondary school, are set aside slowly to purchase the necessary sawn timber to construct a house. In Habangoi, there was strong evidence that the past few years have enabled a number of households to acquire sufficient capital to begin constructing a house in the village with nine houses in the early stages of construction. The fact, however remains that the majority of houses have a number of households living in them as evidenced in table 26, the greatest number being five in both Habangoi and Sebaung. The old traditional houses located reasonably high off the ground and with a high gabled roof and bark cladding are now rare with only one remaining in Malawan and Sebaung and a few in Habangoi.

**Table 26. Houses per Household**

	Tumbang Habangoi	Malawan	Sebaung
Houses per household	0.50	0.49	0.45

While few capital goods are owned, evidence from other Dayak areas would strongly suggest that once there is a permanent electricity supply, demand for electrical goods like televisions, refrigerators and fans will quickly increase. There is a fitful electricity supply in Malawan hooked up to a rice milling machine. It only runs when someone is milling rice after dark or for an important occasion like a festival. In Sebaung, though it abuts Malawan there was no supply. Nor was there in Habangoi, which does have two rice milling machines. An electricity supply is an important amenity, especially for schoolchildren wanting to work and for women wanting to make baskets and mats after dark.

Few households own the traditional Dayak tokens of wealth like old ceramic jars and bronze gongs, cannons and utensils. Most households have a few gold ornaments like necklaces and earrings which are undoubtedly partly an insurance policy for bad times. Table 27 shows the percentage of households owning a number of non-consumable items, which still remain very low. Low asset ownership is an indicator of poverty. From an environmental point of view, the number of chainsaws is an item to watch. While households now have a reasonably ready access to chainsaws and therefore an increase would probably not significantly increase the number of large trees harvested, it and a longboat with an inboard engine remain the most desirable prestige goods. Access to a mechanic might increase the number of working inboard engines. Habangoi, for example, reported some 30 engines being owned but not in working condition. An increase in the numbers of chain saws and inboard engines would be a good index of increasing wealth and cash surpluses.

Table 27. Assets

Assets	Tumbang Habangoi	Malawan	Sebaung
	%	%	%
Inboard engine	10.4	8.1	5.0
Chainsaw	6.3	10.8	-
Television	-	-	-
Radio	36.5	13.5	15.0
Watch	52.1	27.0	20.0
Bicycle	3.1	-	-
Motor bicycle	-	-	-
Gold	99.0	91.9	90.0

### Conclusion

In conclusion, the economic survey indicates that:

- swidden farming needs to be stabilised along more traditional lands and the best swidden land brought back into production;
- a greater variety of vegetable, fruit and rice strains might increase yields and agricultural productivity. They would also contribute to a better diet and hence, better health;
- the economics of rattan gardening are promising;
- assuming that the economics of rattan farming are better than ironwood shingle production, communities should be discouraged from seeking their major incomes from the latter. Initially, such a change might meet some resistance from local leadership as it tends to be involved in trading ironwood shingles downriver;
- household incomes are low with the majority of households being below the poverty level. It will be important to address the poverty so that households are able to develop resources to benefit from the national park rather than concentrate all their activities on making ends meet. The poor will always put their own survival before more esoteric values like conservation.

#### 4. TIMBER CONCESSIONAIRES AND LOCAL COMMUNITIES

The relationship between timber concessionaires and local communities is likely to become increasingly important for the future operations and profitability of timber companies and for their image and standing both on the national and international stage as increasing interest becomes focused on minority rights and good forest management. Profitability can be adversely affected by local communities:

- cutting down production forest for swiddens;
- directly hindering the operations of timber companies;
- gaining international publicity for their problems necessitating costly public relations' exercises on the part of the timber concessionaires.

Consequently, there are persuasive economic reasons for timber concessionaires to build a mutually satisfactory relationship with local communities. The long term planning of a timber company should address this matter. If not addressed effectively, the long term consequences could be detrimental to future margins and profitability of the timber company. Getting the relationship right produces the additional benefit of providing good international publicity for the timber company.

In the Bukit Raya national park area there are three land components: the national park (and cagar alam buffer zones), timber concession areas and land available for swiddens. While the demands on the land for the national park and timber concessions can be managed within present boundaries, there is no guarantee that the future demand of the local population for land can be managed within current available boundaries. The data collected has indicated the rapid population increase presently being experienced by communities within or on the boundaries of the national park and also within timber concession areas. Assuming that there are no fundamental changes to farming practises and current population trends continue, there will be increasing pressures on local populations to begin clearing in timber concession areas or, indeed, in the national park. A few chainsaws can cause a lot of damage to a concession area in a very short time. Experience elsewhere suggests that this does happen and even though reasonably prompt action is taken, it is often after the horse has bolted and the damage has been done. Taking appropriate action is also costly, because it usually means maintaining a non-productive presence in a remote area. One consequence is erosion of profitability quite apart from the damage to local relationships between timber company and local community. Given such a situation, both the timber concessionaires and the

government would be confronted with a very delicate and potentially volatile political situation. There therefore seems a strong argument to address the issue appropriately now and thus avoid difficulties in the future.

The Indonesian government has shown its concern for the issue of local community development by requiring timber companies to introduce a bina desa (community development) program in a neighbouring local community. These programs are designed to have a major impact on the economic development of local communities and thus avoiding the potential problems described in the above paragraph. Their success, therefore, is likely to have important repercussions on a timber company's future operations.

The bina desa programs, however, are based on an unequal relationship between local community and timber company. The timber company usually determines the content of the program and the local community is expected to accept it. The programs in a sense are an example of top down planning. Local communities, consequently, are placed in a client relationship with the timber company.

#### 4.1 The Timber Company as a Good Corporate Citizen

The relationship between timber companies and local communities has a potentially international dimension. Most timber concessionaires are major national companies, often with significant international interests. Increasingly among international firms, the importance of being a "good corporate citizen" is an issue which is addressed very seriously. Public affairs or public relations departments in the corporate headquarters of major industrial groups devote a lot of attention and significant resources to developing the image of the company as a good corporate citizen. Underlying the notion is that the company should contribute positively to the community (often a very broad one) in which it is working and most certainly do nothing to detract from the amenity which the community enjoys.

With the operations of timber companies coming more and more under the spotlight of the national and international stage, the importance of appearing as a good corporate citizen is good business sense, especially as most of the production is exported internationally. Maintaining good relationships with small scale and generally relatively impoverished local communities would be regarded as an important aspect of being a good corporate citizen, especially given current interest in minority rights. The notion, therefore of economic and developmental partnerships between timber companies and local communities which further the economic and social interests of both sides should have a strong appeal. It makes very good public relations. The good corporate citizen working in harmony with local communities in sustainable ventures makes very good publicity copy. In a world where international attention is focused both on the sustainability of the rainforest and on rights

of minority groups, such an approach would have benefits both for the timber companies themselves and for the image of the nation as a whole.

The bina desa program is the mechanism timber companies use to assist local communities improve their economic development. How well the program contributes to the future economic prospects of local communities, then becomes a very important question.

**4.2 The Fit between Bina Desa Programs and a Timber Company's Mainstream Operations**

The first thing to note about bina desa programs is that they are outside the mainstream of a timber company's operations. Studies of corporate excellence show the central importance to a company's success of "sticking to the knitting". A vertically integrated timber company would be in the business of nursery management, forest management, logistics, transportation, workshop management and production management, inventory management, marketing and sales as shown in table 28. If it extended its operations into manufacturing in such areas as finished wooden products like furniture, the only additional skills required would be in design.

**Table 28. The Business of a Timber Company**

Businesses	Expertise
Nurseries	Nursery management
Forest management	Sustainable forest management
Timber extraction	Road construction and maintenance Timber extraction
Transportation	Logistics River and road transportation Repair workshop management
Sawmill operations	Production management Inventory management Marketing Sales
Manufacturing	Production management Inventory management Marketing Sales

In contrast, bina desa is in the area of social development. It sets out to change the technology and behaviours of a local community. The programs examined in Kalimantan Tengah seek to transform practises and a way of life which has been habituated over centuries. Technologies used by local communities are rooted in their belief systems. Removing technologies from a belief system means that it becomes divorced from the ritual support which serves to maintain its vitality. Consequently, alternative mechanisms have to be found to support the new introduced technologies. General experience is that solutions are very difficult to find in this field. Experts in social development have had only limited success. A company not in the business at all would find it very difficult to be successful. Failures do not make good public relations copy, however well intentioned the program might be. Consequently, there is a strong argument that an inappropriately designed bina desa program is likely to have future significant costs for a timber company should its operations not contribute effectively to the immediate economic interests of local communities.

The problem can be illustrated organisationally. The bina desa manager reports directly to the manager of the production operations in the field. A key aspect of management is effectively monitoring the activities of the personnel reporting to the manager. As illustrated in table 29, in a production orientated operation, unit cost of production is a critical factor in monitoring performance. The manager can monitor the performance of each of his assistant managers by reviewing output reports on a regular basis (e.g. monthly) and comparing the unit cost with budget to measure efficiency. Where performance is falling short of planned, he can take immediate action to redress the problem (at worst a month late if reporting is monthly). Each of the areas has a critical impact on profitability. Where performance falls short of expected, costs per unit of output increase and profitability and competitiveness is reduced.

How then does the production manager effectively monitor the operations of the bina desa manager. For one thing, timber companies do not yet appear to approach the bina desa program in a business way. Approaching bina desa in a business way would require quantifiable, measurable objectives to be established for the program and a management reporting system to report on performance. In contrast, objectives for the bina desa program are not clearly stated. They are also long term. If the bina desa manager's performance is below expected, it is highly unlikely that the timber company manager will become quickly aware of it. For one thing, he has absolutely no experience whatsoever in the field of community development. Secondly, failures do not have an immediate impact on profits. therefore, there are not the same imperatives to address problems expeditiously. On the other side of the coin, when the bina desa manager experiences technical difficulties in the field, to whom does he turn for advice? As the area is outside the realm of the company's expertise, there is no one. Organisationally,

therefore, from a timber company's perspective, the bina desa must remain a peripheral activity. Not being mainstream, it is less likely to receive the critical attention required if, as is being argued in this chapter, its long term consequences on profitability are significant.

A common organisational solution to the problem of an operation outside the mainstream of a company's business is to contract an organisation with such expertise to do the work rather than to try to establish the expertise within one's own organisation. Consequently, an organisation like Coca Cola, which is in the business of manufacturing and merchandising soft drinks employs transport companies to deliver its products to its sales outlets on the basis that it is not in the transport business and a company in that business will do it more cost effectively. This is not to say that efficient delivery of soft drinks to retailers is not critical to the continuing profitability of Coca Cola. The last thing that Coca Cola wants is to have retailers experiencing stock outs and customers turning to competitors' soft drinks. It therefore sets performance criteria for the transport company which the latter is under contractual obligation to meet.

Bina desa programs might be approached in the same way by timber companies. Being in the community development field, they require an expertise which is not in the mainstream of timber company operations. The objectives of the programs, though, can be articulated reasonably concisely for they are very much in the area of economic development and increased wealth for the communities. One problem facing timber companies is that there probably is very little expertise in Kalimantan in the field of fairly intensive community development. In such a case, the most sensible approach would be for timber companies jointly to establish such an expertise rather than individually dissipating their energies trying to develop effective programs. Consequently, the present approach to bina desa programs whereby timber companies employ gifted agricultural graduates should be reviewed. In the field of social development, a better approach would be for the timber company to contract an organisation, probably an NGO, experienced in the social development field to carry out bina desa. If necessary, timber companies, jointly should consider assisting an organisation to develop such an expertise. Preferably, that organisation should be directed by local Kalimantan people which would facilitate the organisation quickly gaining the confidence of the communities it is attempting to assist.

Table 29. Performance Management in a Timber Company

ILLUSTRATIVE

Timber Company Manager						
Reafforestation	Operations	Construction	Transportation	Workshops	Services	Bina Desa
<u>Performance Management</u> Cost per ha. planted % surviving Growth per annum	<u>Performance Management</u> Production schedules met Cost per cubic metre Daily throughput	<u>Performance Measurement</u> Cost per km. constructed Cost per km. maintained Days lost for rehabilitation	<u>Performance Measurement</u> Delivery schedules met Cost per cubic metre shipped Cubic metres lost	<u>Performance Measurement</u> Vehicle utilisation Vehicle downtime Cost of inventory	<u>Performance Management</u> Transaction costs Timeliness of reports	<u>Performance Management</u> ?

### 4.3 Bina Desa Programs in the Bukit Raya Area

The bina desa program carried out at Tumbang Baraoui is an excellent example of a well managed program. It is located by the headquarters of a timber company's main camp and targets a local village. It is being carried out by an energetic agricultural graduate and former teacher from Kediri in Java. He has focused on producing vegetables for the camp and employs two assistants to help with the cultivation. The vegetable gardens are testimony to his industry. They have been contoured. Remains of harvested crops are used for compost. Fertilizers are applied. The result is two vegetable gardens which were providing good yields of peanuts, brinjal, long beans, soya bean, tomatoes, maize and ensabi. Cultivation, clearly is very successful and a great tribute to the energy and ability of the person directing the program. He has plans to expand the development to open up sawah rice production on a site about 4 kilometres from the village and camp. He also has plans to establish small industries producing tahu and tempe, bamboo furniture and rubber sandals from used tyres, all for sale to the personnel in the camp. What seems to be occurring is the development of a symbiotic relationship between local village and timber camp, the former supplying the needs of the camp for certain commodities and consumable items. While the supply and demand factors are maintained in balance, the relationship should prosper so long as the bargaining power of the villagers with the monopoly purchaser remains strong. When supply outstrips demand and there is no alternative market for vegetables, the community will need to establish other economic activities to meet its needs. The market at the moment seems small and it seems unlikely that the needs of the local camp for fresh vegetables and meat is likely to provide for all the local community's future cash needs. The bina desa program, consequently does not produce the means for a community to use the new technologies to increase its wealth. Rather, it is focused on a community meeting subsistence needs and supplying a very restricted local market. It provides no basis for expansion.

In the lack of a market lies a fundamental weakness in the design of the program. The weakness is that it cannot be generalised and exported effectively to other communities. However successful a community might be in adapting to the needs of horticulture on tropical soils, it will have no market for the produce. At best the produce will be useful supplements to the household diet. Consequently, no community will grow rich on a vegetable planting program and it will have to continue to seek other opportunities to gain the cash incomes it needs to survive and prosper.

The fact that the program will not lead to significantly greater prosperity for the local communities leads back to an earlier observation: that, in a business planning sense, timber companies do not appear to have worked out what the objective of the bina desa program should be. If, as is implied in this discussion, it should be directed at optimising the opportunities of communities to

increase their wealth, then, prior to determining the content of a program, a marketing study should be performed to determine what are the best opportunities given the remoteness of most of these communities. Once a marketing study has been completed within the context of the business objective for the program, the danger of producing some commodity for which there is no market will disappear. The program itself would be established on a good business footing.

A serious problem in the bina desa program is that, while it might seem to an organisation used to the intensive agriculture of Java to have modest aims, it is very ambitious. As has been mentioned earlier in this report, the Dayak approach to farming is of a non-intensive kind. It requires no inputs, occasional care and the results are on, average, relatively satisfactory. It is also non-repetitive allowing the Dayak plenty of time to pursue other economic and social interests. In contrast, market gardening requires intensive, repetitious inputs. It also requires a technology like the contouring of slopes, the provision of inputs like fertilizer and weedicides and a rotational timetable which presumes an intimate knowledge of the relationship between crops and the soil they grow in. Not only has the Dayak no prior experience of fertiliser and weedicide application, he has to buy it. Often it is unavailable in the local markets. When it is, it is very expensive. In contrast, the swidden system is based on a religious timetable which determines when specific broad activities should be started. Good selection of site, following the very broad timing requirements, weeding satisfactorily, guarding the ripening rice effectively and a fair measure of luck are the only requirements for a successful swidden crop. The contrast, then, is enormous. The gulf becomes ever greater when the new system is supported scientifically and intellectually rather than ritually.

The bina desa programs of both timber companies visited in this survey are grappling with this problem but have not yet found any solutions. Alongside the excellent gardens maintained by the bina desa manager in Tumbang Baraoi are others started by local Dayaks and maintained entirely by them. Without exception, the trenching does not follow the contours of the hills, weeding is peremptory, crops are not rotated scientifically and the result, is that along grasses are beginning to take over the areas. Without the presence of the bina desa manager, the plots would have reverted to along along even earlier. Another bina desa program in Tumbang Heran targeted 13 households. Houses were built for them and they began to farm half hectare blocks. Tumbang Heran, being the local kecamatan centre also provided a potential market for their produce. After three years, only one household is maintaining its block. The remaining blocks have largely reverted to scrub or along along grasses. The latter grasses are a symptom of the risk of failure of a program trying to introduce intensive agriculture on the soils of Kalimantan. Failure has a devastating impact on the land's ability

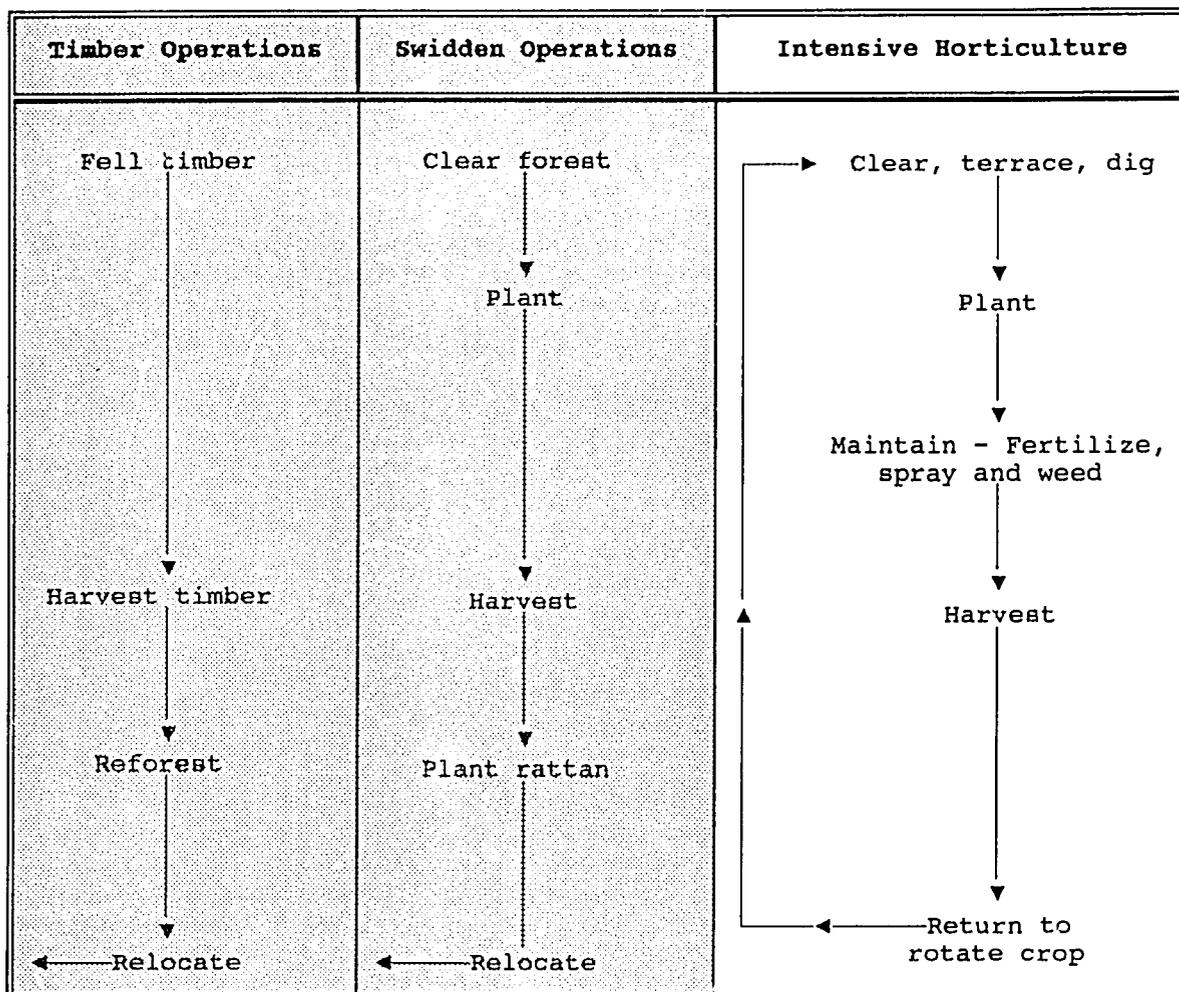
to regenerate and introduces a potent fire hazard which itself could have adverse environmental consequences.

The lack of success of the two programs examined is no reflection on the capacities of the bina desa managers; nor on the preparedness of the timber companies to support such a program. It does, however, illustrate the difficulties and ambition of such a program and calls into question the fundamental design of it both in terms of content (intensified agricultural production) and process (managed by keen enthusiasts rather than organisations specialising in community development). It lends support to the earlier recommendation that social development programs are not within the ambit of the normal expertise of a timber company and, therefore, it might be better to contract in experts rather than to try to run the programs oneself.

#### 4.4 Rattan Production and Bina Desa

There is one forest commodity (apart from the whole range of timbers), the production and distribution of which does fall within the expertise of a timber company. That commodity is rattan. It can equally well be grown in regenerating swiddens and forest. Its cycle has a good fit with a timber company's production cycle and a swidden farmer's bush/fallow cycle. Both cycles, technologically, are similar as illustrated in table 30. Both involve exploiting the resource over a short period and then either allowing it to regenerate or assisting with that regeneration by selective plantings. The area then goes out of production for a long period of time before becoming mature enough to be reharvested. Maintenance during this period is, at best, cursory. Regeneration occurs of itself. Secondary plantings in the regenerating area can equally well occur in swiddens and regenerating forest. Both consequently have a very good fit with a swidden agriculturalist's approach to farming.

Table 30. Swidden and Forest Production Cycles.



The previous chapter, using preliminary figures which need to be verified, showed that, even at current low prices, the economics of rattan collection are promising. It also showed that current approaches to rattan cultivation are pushing swiddens further and further away from the settlement and, with the rapid increase in local populations, presenting a serious future threat to the security of the national park or to the growing resource of a timber company.

Rattan production could form a mutually beneficial meeting point between timber company and local community:

- local communities need to expand their rattan gardens somewhere;
- rattan harvesting does not threaten standing timber supplies;

- timber companies need to implement a reforestation program immediately after harvesting a block;
- labour is at a premium in most forest areas;
- imported labour requires a reasonable capital investment in the provision of amenities for the imported workforce;
- local communities could supply a reliable local labour force.

There are a number of strands which can be tied together very effectively. The effectiveness of the knots, however, will depend very much on how the strands are brought together, which is where the notion of a partnership between timber company and local community might have merit.

The timber companies could approach the production of rattan simply by becoming the primary producer themselves. In such a scenario, they would simply seek to employ local labour at current wage rates. There would, however be potential problems:

- the scale of rattan production might not have the critical mass necessary to make it economic;
- it is very unlikely that the timber company would obtain a reliable workforce because of the repetitive nature of the work and the requirement to work at the same repetitive tasks on a daily basis. For people who have a number of economic alternatives, such an opportunity would not be valued highly;
- the alternative of bringing in a workforce might make the economics of rattan production even less attractive.

A second alternative is for the timber companies to approach the challenge by joining in a partnership with local communities and assisting the latter to develop the market for themselves. They would be able to assist the communities in areas in which they have expertise like management, transportation and marketing. They would also be able to communicate and reinforce the important value of sustainable forest production which would help to protect their asset base from any land hungry swidden farmers. Reinforcing such a value would also encourage local communities not to regard the resources in the national park as inexhaustible and therefore temper their hunting and gathering activities, particularly with regard to the trapping of birds, the collection of gaharu and the hunting of tortoise. Finally, such an approach would have the potential for

good public relations and, indeed, if implemented creatively, could provide a number of flow on benefits for the timber companies, particularly in the area of a pool of labour being available from time to time for reforestation work.

Currently, the public relations' work of timber companies with local communities has not achieved great successes. By and large, local communities exhibit a great suspicion of timber company's motives and a belief that they will exploit local labour unfairly given the opportunity.

The image of the timber contractor as exploitative clearly sits very uneasily on the earlier comments in this chapter. Exploitation in any guise usually only has short term pay offs. In the long term, it can lead to major problems with those exploited. Timber development is a long term business. Consequently, to remain cost efficient, timber companies must consider long term consequences of present policies on future profitability. Consequently, before there is an attempt to start any notion of a partnership with local communities, timber companies need to address some pressing issues regarding their future policies towards local populations and the quality of relationship they hope to develop and maintain. These policies will be components of the corporation's policy on being a good corporate citizen and clearly need to be developed and endorsed at corporate headquarters.

At the moment, local communities in the upper reaches of the Katingan do not articulate any concern about land pressures. To the question of whether they regard the land resources as sufficient for their needs, there was a unanimous answer that it is sufficient. They consider that they have rights to all land within five kilometres of a river source. They do not yet perceive the economic advantages of concentrated rattan farming. Consequently, at the moment, it is unlikely that the local communities would perceive any value in expanding their rattan gardens into production forest unless there is something in it for them.

Table 18 showed the competitive advantage rattan enjoys over other products. Rattan production has the ability to increase the wealth of local communities significantly without in any way threatening the local environment so long as it is incorporated on land which is in an equivalent production cycle. Communities which are organised well would also enjoy a competitive advantage over other suppliers on the basis that a well organised producer will, on average, outperform a casual producer. What now needs to be done is, after having verified the economics of rattan production, to convince the residents of villages in the Bukit Baka/Bukit Raya national park area of the advantages of exploiting the resource.

Rattan production could be a much more appropriate focus for bina desa programs than the current emphasis on horticulture and intensive cultivation. The assistance a timber company could give a

community is very much in the timber company's business expertise. Timber companies are in the business of managing the processing of something like rattan as well as in the business of transporting material like rattan to markets. The processing of drying and cleaning rattan would be a simpler though similar operation to running a sawmill. Transporting it to market would also be similar to though simpler than transporting, for example, plywood. These are areas in which local communities have very little experience. In terms of markets, they have neither the appropriate contacts nor up to date information about price. Nor do they have the capital to invest in the kind of equipment one needs to transport the rattan to market cheaply nor the throughput to warrant the investment in the first place.

Such a focus could fit into a timber company's own career planning. Helping a small community manage the whole range of operations necessary to make rattan processing profitable would be excellent experience for an up and coming manager. He would gain experience in the whole range of skills a senior manager needs. As developing one's own staff is a major performance criterion for an effective manager, passing on his skills to members of the community and thereby contribute to community development, would be a major aspect of the job. Consequently, one could argue, supplying an able member of staff to the community would produce returns on the investment in the experience gained. The same could not be said for the current bina desa manager who acquires few skills relevant to the business of timber management.

A partnership assumes a reasonably equal and trusting relationship between two entities to pursue mutually desirable goals. If communities are to contract with timber companies, as they would do if they used company vehicles to transport their rattan to the market or provided services to a company like reforestation an area, then they require some kind of legal entity to do the contracting. Such a requirement indicates the need for some kind of incorporated body or the establishment of some kind of corporate umbrella under which the community will operate.

The incorporation of a community could provide benefits to the timber company. For one thing, they would only need to deal with one person in the community, i.e. the company manager in all matters affecting the business. Additionally, they would gain access to a local workforce. Timber companies complain of the unreliability of the local Dayak workforce with particular reference to absenteeism. Rural Dayaks are not used to doing the same work day after day and so would probably take a little time to get used to regular working hours on a regular job. An alternative to employing individual Dayaks would be to contract a "community company" to provide a service, payment being made on fulfilment of the contract. Where the timing of the completion of a task is not critical like the replanting of a harvested block with seedlings, contracts could be made with reasonably tolerant completion dates. If communities are

able to determine when they want to perform a contracted task, they might be more willing to perform it for a reasonable consideration. Where, in addition to the consideration, they are able to plant rattan which they will have sole right to harvest, the arrangements should have an even greater economic appeal.

The arrangements, also would not conflict with Dohoi concepts of land tenure. They already possess a concept similar to hak usaha and is observed in traditional land use practises particularly with regard to the planting and harvesting of fruit trees.

As part of these arrangements, timber companies could also give the local communities access to other economic activities. Usually, in a recently harvested block, there is felled timber which is too small for the timber company economically to harvest but which is still sufficient to be sawn into planks or other building materials. This timber is usually left to rot by the timber company. The timber could be assigned gratis to the community for its own use, either to saw using some kind of portable sawmill or by using chainsaws it already owns.<sup>16</sup> If reports of the amount of unused timber on a block are accurate, there would probably be enough to maintain the income of a community through selling the sawn timber for the eight year period before their own rattan planting begins to yield a commercial return.

Assuming that communities perceive a value in working in with timber companies so that they can exploit the rattan industry profitably, the effective development of the community rattan production and processing "company" could then become the objective of the bina desa program. Careful planning would need to be done before any activities are begun. For the timber company, planning would have to embrace questions like:

- the level of assistance companies are prepared to provide;
- what kind of policies will be developed to guide companies in their relationship with local communities. Such policies would need to be incorporated into the corporate goals, of the companies concerned and therefore need to be addressed at corporate headquarters;
- how communities should be approached to determine their interest in such a working relationship, (especially given the fact that timber companies have some leeway to make up in their relationship with local communities). At this stage, the timber company might be advised to use an NGO as an intermediary

<sup>16</sup> Alistair Fraser of ODA made this suggestion

initially so that they have access to advice of an organisation skilled in social development. An Ngo would have the additional advantage in that communities should perceive them as impartial;

- what assistance the timber companies will provide to assist a community to establish itself. The concept of community incorporation might require some lobbying at national level before it becomes practicable;
- what specific assistance companies will give with buildings like a long shed for processing the rattan. Planning should bear in mind the need to ensure that the community owns its business and does not come to expect the timber company to do everything for it. All communities complained of a dearth of skilled artisans to assist in the building of houses. That dearth would also apply to the construction of a shed which is where a timber company's resources, both material and human, would be very useful;
- what arrangements will be made to assist a community with the transport of loads to a satisfactory market. Such arrangements should be regarded in purely commercial terms;
- what information should be provided to communities about market conditions for rattan given that the very remoteness of these communities militates against their obtaining accurate information themselves.

One guiding principle should be that nothing should be done which would lead to the community developing a dependency relationship with the timber company. The communities must be assisted to stand on their own feet. Enabling them to do this would be an underlying objective of the bina desa activities. Helping them develop and manage a profitable rattan business, however, would remain the principal objective.

Being an incorporated body offers a community a number of advantages:

- it can contract for the supply of rattan to large merchants, guaranteeing supply and quality;
- it can organise a more efficient production cycle including the management of quality control which would optimize price and profitability;

- it can contract for the supply of services like transport and management because it will possess the necessary critical mass;
- it can contract with timber companies to perform certain tasks like the planting of seedlings in a given area and so gain a reward while planting its own crop;
- it can employ its own members in tasks most suited to their skills.

The development of such an industry would have to be done within an overall community development program. The community development aspects are great. Communities have no experience of working as a "company". Historically, the Dohoi are very individual, with each household being responsible for its own livelihood. Communities would have to make decisions about such matters as:

- ownership of the "company";
- how contributions would be recorded and rewarded;
- the ideal organisational arrangements, which might be a subdivision into groups of households;
- who in the community will be trained in administrative and management matters;
- how working arrangements will be managed with the timber company;
- how the organisation will be managed; **and, most importantly,**
- how the development of the business would fit into the overall community development program of the community and what priority should be given it.

Careful arrangements would have to be made about those areas in which the communities would receive no assistance from the timber companies and those in which they would. One guideline might be that where there are numbers like a large group going to plant an area or a large load to be carted to market, the company should provide the transport (in the former at no cost as it would be part of the planting contract with the company; the latter at a reasonable rate as part of a commercial deal). Harvesting of the rattan would be done individually without recourse to assistance of the company as that would be done by individual households. It will be important for these questions to be resolved at the outset. The danger in not

so doing would be that false expectations would be built up on the part of the community and the development process hindered by the usual aftermath of disappointed expectations.

#### 4.5 Other Related Development Opportunities

Harvesting might be an area in which some creative thinking and experiment might be applied. If rattan gardens are to be located a distance away from the settlements and from the major river, then harvesting will include the onerous task of dragging the rattan back to the settlement or to a point where it can be loaded onto a boat and taken to the settlement. If the rattan gardens are planted in reforestation areas, then they will be close to roads. Already Dohoi in Tumbang Heran are using push carts constructed over a pair of bicycle wheels. These carts enable them to carry heavier loads. The advantage of the horse or mule might be worth investigating. It has been introduced successfully in the Wasur national park outside Merauke in Irian Jaya. It might be ideal for dragging lengths of rattan reasonably long distances either like a papoose or attached to some simple two wheeled vehicle. An additional advantage of the horse would be that as the national park is developed, the horse might be an ideal way for tourists to go on nature treks. It would enable them to travel much greater distances than they would on foot. They would also not have to worry about snakes, leeches and the like which might set their minds more at rest and enable them to enjoy the national park the more. Introducing the horse is something a timber company could do without difficulty and at no great cost as part of its corporate citizen program.

Another aspect of the corporate citizen, given the potential of tourism to the economies of communities in the locality of the national park, is to assist communities to prepare the village for tourists. The Dohoi are famous for their carved posts. In all the villages there are good examples of such posts and the small figures placed below the household shrines. The posts are carved and erected during a tiwah festival, in which the bones of the dead are disinterred and reburied in an ossuary in the village and ceremonies are held specifically focused on renewal and regeneration. Most communities do not hold tiwah festivals because of the expense. A relatively small contribution from a local timber company as part of its corporate citizen program might be enough to support such a ceremony and increase the statuary in the village which in turn would make it a more desirable place for tourists to come to.

**4.6 Conclusion**

Table 31 summarises the benefits a bina desa assisted rattan industry would have for the three major stakeholders.

**Table 31. Benefits of a Bina Desa Assisted Local Rattan Industry**

Stakeholders	Benefits
The Government	<ul style="list-style-type: none"> <li>• pressures will be removed on opening up land in the national park</li> <li>• wealthy communities are no drain on the government's social welfare programs</li> </ul>
Timber Companies	<ul style="list-style-type: none"> <li>• local communities benefiting from sustainable development of tropical rainforest is very good public relations internationally</li> <li>• there will be access to a local pool of competitively priced labour</li> <li>• pressures on communities to farm production forest will be removed</li> </ul>
Local Communities	<ul style="list-style-type: none"> <li>• gain access to expertise of timber companies in the processing of a timber product</li> <li>• gain access to scarce land to produce value</li> <li>• significantly increase their wealth</li> </ul>

## 5. COMMUNITY DEVELOPMENT

This report makes a number of suggestions and recommendations about change to enhance the social development of the communities in the survey. Many of the suggestions and recommendations would result in profound change to the modus operandi of the communities concerned. In essence, the agricultural changes would have the effect of pushing the communities towards a more scientific approach to farm management either within a swidden system or, increasingly incorporating sawah cultivation. The recommendations regarding a cottage rattan industry would be equally profound if they also incorporate the systematic planting of rattan in forested areas of a timber concession. Communities are also having to make a number of smaller adjustments as government programs begin to affect lifestyle. The impact of all these changes will have profound consequences for community leadership and for a community's ability to deal with problems as they occur.

The government vehicle for community development is the Village Resilience Institute (LKMD, Lembaga Ketahanan Masyarakat Desa). The LKMD was introduced with the hope of promoting bottom-up planning processes as well as strengthening a sense of self-determination in the community through being active in all decision making affecting a community and through participating in the implementation and co-ordination of development projects within the village.

The LKMD is a community organisation with a Chairman (usually the Kepala Kampung), two assistant chairmen, a secretary and a treasurer and 10 kader representing the ten activity sections of the LKMD, namely:

- religion;
- promotion of Pancasila;
- security and order;
- education and information;
- environment;
- development, economics and co-operatives;
- health, population and family planning;
- youth, sport and art;
- social welfare;
- family welfare (PKK).

Departments which have extension workers in the field, e.g. Pertanian and Peternakan, are expected to develop links with their respective kader. The idea is that if those links are successfully developed, real bottom up planning can occur through the strengthened role of the kader and the consequent demand on its services. As the focus of a number of the kader is on work in the women's sphere, the LKMD also represents an organisation at the village level which has the potential of increasing the voice of women in local level planning.

In all the villages in the survey, the LKMD were inoperative. Given that the villages are quite small in size, an operational LKMD with individual kader for each of the ten areas would require the devotion of a great deal of the time of anyone interested in these developments. At the moment, a full LKMD would probably be too complex for the economic development of the villages, especially as the organisation of the LKMD would require a major effort being devoted to co-ordinating effectively major activities of different kader.

With the Village Law No. 5/1979, the Inpres Bantuan Desa was decreed by the President as an annual grant to the desa to support village development. In 1990 the annual Inpres Bantuan Desa was Rp. 2 million per village. The prescribed process for decision making on the use of the grant was to be one of consensus through discussion at the level of village groups and sanctioned by the village council. The LKMD was to develop proposals for projects and to implement them based on village made plans. Bangdes grants have been received in the villages in this survey, going towards purchasing a boat and inboard motor, rice mill and electricity and community buildings. Usually the kepala kampung has been the vehicle through which the projects have been implemented.

A community development program of the relative complexity recommended in this report requires very careful planning. It will require both a long term plan, part of which needs to be consolidated with the long term plans of the national park and an operational plan setting out the individual steps necessary to achieve the long term objectives. One principle which should invest any such plans is that individual components should be implemented incrementally. Any organisation or community, wherever it might be, undergoing any significant change will be able to cope with change component by component. It would not be able to cope if it was confronted with a number of changes concurrently. Consequently, the planning of a community development project must also take into account all other proposed changes the communities are going to introduce from other areas, and in particular from government.

## 5.1 Leadership

A critical success factor in any change program is the quality of leadership. Belsky (1992:68), for example, in her report noted that the most successful village to develop irrigated rice fields was one in which there was "a more powerful and well-respected village head in this village who eagerly supports the ... program." The smaller the population, the greater the probability that effective leadership will not exist. The probability would be reduced even further where, as in the case of the communities in the present survey, traditional leadership has been eroded and replaced by a democratically based administrative system in which leaders are elected and have to perform a number of onerous administrative duties. One aspect about leadership is that it often is exhibited by particular families. Through observational learning, the children learn the practise of leadership from their parents. The children of other families enjoy no such advantage. A principal objective of leadership is the leading of followers in furtherance of an objective. A major constituent of leadership is success. People are more inclined to follow the successful than those whose achievements are more patchy. Traditionally, one of the most important responsibilities of leadership was to maintain the community as free of disputes as possible so that, spiritually, it did not stir up foment in the extraterrestrial world. Nowadays, these responsibilities are less important and, consequently, leadership itself is moving towards desuetude.

In a short duration survey, it is very difficult to assess the quality of leadership. In one community, the kepala kampung was absent for the whole period of the survey. In a second community, the kepala kampung had recently been elected in a poll in which about 30% more votes were recorded than adults entitled to vote, a fact which was causing no little discussion. The poll was required after the previous kepala kampung had been unable to account for a grant he had received. The result was that he quit the community under a certain amount of duress. Current leadership cannot be described as stable in this community. In the third community, the current leadership was entrepreneurial and appeared very promising.

There was one example of community work on a gotong royong basis observed during the period in the field. The objective was to clear a small area so that a community building could be erected there. Most of the men of the village were present. People rolled up casually and broke into small gossip groups. A cursory inspection was made of the site by three men. Eventually, after about 45 minutes, the men began to drift down to the site, which was cleared in just over an hour. Everyone knew what was required of him and the whole operation was conducted in a consensual and unspoken way. Such an approach would not work on a more complex task where different inputs are required from different people and they also need to be co-ordinated. Leadership, per se, was entirely absent.

A second consideration about leadership in a complex change program is that, if it is in short supply, it is important not to overload it and risk it becoming burnt out. At the initial stage of the community development plan, it will be important carefully to allocate responsibilities only to people with a reasonably good chance of success and be very careful to ensure that the responsibilities are well within their capacity.

The alternative is failure. The problem with failure is that it tends to stay dramatically in the mind and discourage people from either trying again or moving on to other components of a project. Therefore the planning stage should also seek initially to introduce changes that are very likely to succeed and so ensure that the community development program enjoys widespread support within the community by dint of its success.

A corollary of good leadership is good management. Good leaders can be inspired persons with a vision and an energy to obtain that vision. They do not necessarily make good managers. An important recommendation in this report is the idea of incorporating communities in some way to run a rattan production operation. A major part of the community development program will be to co-ordinate a number of inputs from three quite different areas. Each of these areas might be pursuing quite different agendas: the Project, government agencies and timber companies. Managing these inputs effectively will be a complex task and a major challenge of any community development program. It would be prudent to assume that local leadership might need some professional assistance in this regard, part of which might be provided under the bina desa program of the timber companies.

## 5.2 Community Development

A community development program which seeks to get communities to reorganise the planning of their swidden rotational system, seeks opportunities to develop sawah farms and sets out to develop a small cottage industry based on rattan processing needs careful planning and implementation. It is complex and the timing of inputs must be co-ordinated carefully with a community's willingness, to work.

Expert assistance will be required. Given the number of communities in the project area and the critical need to get the development programs right to ensure that the national park is not put under any pressure from land hungry swidden farmers and that timber concessions remain undisturbed. If the national park is identified directly with a series of community development programs, it will also contribute to a community's interest in and identification with the national park. The Project therefore, should identify an NGO which will be able to support the community development programs in the field. Preferably, it should be an organisation that has strong linkages with local indigenous development.

The Project is not a community development project and herein lies a dilemma. It has not been set up nor resourced to manage a community development component. Nevertheless, the Project, in the development of a master plan for the national park, should consider the importance of the following to any community development program in the settlements abutting the national park:

- providing resource material for an NGO to use in the design and teaching of community development training courses. From the Project's point of view, there would be a strong justification for funding at least a conservation and natural resource management component in such a course;
- working with an NGO in the development of a locally based community development program, initially focused on a small selection of villages closest to the national park;
- seeking avenues for providing funds for the NGO to establish itself so that it is able to support the project's objectives;
- seeking means to assist the NGO to strengthen its internal management to ensure that the demands of the project will not overstretch its capacity to deliver its existing and the proposed additional programs. In this regard, the timber concessionaires might be able to provide some assistance. For example, NGO management might be able to participate in internal management courses run by the timber concessionaires.

Finally it might be wise to consider what risks there are to the successful completion of an ambitious community development program of the kind envisaged in this report. A major risk is that the implementers of a community development program will, in their anxiety to meet program milestones and completion dates, unduly hasten the process and, in so doing, lose the commitment of agencies and people to the plans. At the design stage, it is impossible to predict how long a process is likely to take. The plans should proceed at the pace of the local community which must first decide that such a program would be in its best interests. The process would be enormously helped if some runs were posted on the board in the early stages of the process, like the provision of potable water which has already been provided in the Kalimantan Barat communities. It must be remembered that the communities will be being asked to embark on a long term process, the outcome of which must, certainly in the early stages, at best remain obscure. They must not be rushed and the resultant plans must have the backing of the whole community to have any chance of being successfully implemented. That will involve compromise between different interest groups in the community on some very important issues like, for example, the use

to which land is put and the need to stabilise the swidden cycle. Compromises on such important issues are achieved neither easily nor quickly.

If implemented effectively, a community development program could lead to all the communities within the general area of the BB/BRNP being economically secure and contributing effectively to the objectives of the national park.

## APPENDIX 1 TERMS OF REFERENCE

### Preliminary Socio-Economic Survey of Bukit Raya Area Bukit Baka-Bukit Raya National Park West/Central Kalimantan

#### Background

The USAID-supported Natural Resources Management (NRM) Project has four long-term advisors assigned to the Bukit Baka-Bukit Raya National Park area to carry out activities under the prescribed NRMP-SFMP Joint Implementation Plan. These advisors include: West/ Central Kalimantan Team Leader/Forestry Research Advisor (TL/FRA), Social Forestry Extension Advisor (SFEA), Nature Conservation Advisor (NCA), and Agro-Forestry Advisor (AFA).

#### Purpose

As the project moves forward with the implementation of field activities in Bukit Baka-Bukit Raya National Park, West/Central Kalimantan, there is an urgent need for solid qualitative and quantitative data regarding household/community dependence on forests in villages within and adjacent to Bukit Raya area, Central Kalimantan.

Given that the livelihoods of many communities depend to a lesser or greater extent from natural forest resources, both timber and non-timber, NRMP needs comprehensive information on why, how and how many households in the Bukit Raya area, particularly "enclaves communities", depend on the National Parks and adjacent forests. The results of the preliminary socio-economic survey will provide needed data and information to fit the basic needs of local communities to the goals and objectives of the national park.

It will be carried out by consultant with data collectors and analysts if required.

#### Objectives and Tasks

- a. To design and conduct of the preliminary socio-economic survey of the targeted local communities in consultation with local SBKSDA/ PHPA counterparts, NGOs, universities, the NRM/ARD Team Leader and on a day to day basis with the NRM/ARD Social Forestry Extension Advisor.

- b. To provide solid socioeconomic data and information on communities living in the Bukit Raya region on the national park.
- c. To identify activities of local communities that offer opportunities to encourage their participation in designing as planned and helping to implement the National Park management goals and objectives.
- d. To define the extend of target community dependencies upon adjacent forests and recommend extension activities to accommodate the basic needs of villagers within National Park extension programs.
- e. To identify target community key social units/social actors and patters of social actions for extraction forest products.

### Outputs

- a. A final report that includes the following:
  - Description of communities living within "enclave areas" of the national park, including ethnic distribution and social structures.
  - Description of livelihood activities and patters of forest dependence which might or might not impact on the conservation goals and objectives of the National Park.
  - Definition of priority options for extension strategies and action programs to accommodate local community needs and conservation goals of the National Park.
  - Recommendations for additional socioeconomic action research and monitoring needs.
- b. At least two local rural sociologist/KSDA staff trained in social analysis and participatory rural appraisal methodology and techniques.
- c. Presentation of draft and final report to GOI counterparts in Palangkaraya and Jakarta and to USAID.

### Reporting

The consultant will prepare a draft report to be discussed with relevant local government agencies in Palangkaraya and USAID. The final report, including inputs from presentations, will be submitted through the NRM/ARD Chief of Party to GOI and USAID.

The consultant will report to the NRM/ARD Chief of Party liaising closely with GOI counterparts. In Palangkaraya he/she will work closely with the GOI counterparts and the NRMP/ARD advisors. The consultant must turn in/copies of all raw data/materials to the NRM/ARD Chief of Party through the NRM/ARD Social Forestry Extension Advisor.

### Duration

Up to 65 working days.

### Location

Jakarta, Pontianak, Palangkaraya and project villages.

### Qualifications

- a. A Masters degree, preferably PhD, in rural sociology/ anthropology or a related field.
- b. Experience in setting up and carrying out rapid rural appraisal surveys preferably in Indonesia.
- c. At least five years experience working in rural areas of Indonesia, preferably in Kalimantan.
- d. Good written and spoken English preferably fluency in Bahasa Indonesia.

## APPENDIX 2 METHODOLOGY

The field research was done by a team of three. There were five aspects to the methodology:

- application of an economic questionnaire to individual householders. The questionnaire was neither tested nor piloted before going into the field and has a number of deficiencies. The questions on what was planted were time consuming and after some time repetitious and would be better asked of groups. Wherever possible, interviews were conducted with both husband and wife to ensure that there was a degree of confirmation of the data. The economic questionnaire is given at the end of this appendix;
- application of group questionnaires to males and females to determine what uses they put the local forest to. The questions were open ended and required consistent probing to obtain as complete a list as possible of everything which was utilised. This questionnaire is also given at the end of this appendix;
- application of a questionnaire about the village with the kepala kampung. Part of the design of this questionnaire was to elicit population statistics, easy access to which was thwarted by the absence of daftar penduduk. the population statistics, consequently, were collected by laboriously identifying each household and working out the ages of the children either with the parents themselves or, where they were in the swiddens, with a group of people including the teachers. this questionnaire is also given at the end of this appendix;
- observation. Visits were made to farms, timber processing sites, rattan processing sites and other areas;
- open ended and extended interviews with prime informants like the kepala kampung and sekretaris, government officials visiting the villages, company officials and senior women.

**Data mengenai Dusun/desa - Hasil Wawancara dengan Kepala Desa/Dusun**

- |                              |  |                  |
|------------------------------|--|------------------|
| 1. Nama Dusun                | 2. Nama Kepala Dusun/desa                            |                  |
| 3. Nama Desa                 | 4. Nama Kecamatan                                    |                  |
| 5. Nama Kabupaten            | 6. Suku apa?   |                  |
| 7. Warga apa?                | 8. Bahasa apa?                                       |                  |
| 9. Keluarga, berapa?         | Kelamin kepala keluarga - berapa laki?<br>perempuan? |                  |
| 10. Penduduk, berapa jumlah? | Jumlah laki  | Jumlah perempuan |

Umur	Laki	Perempuan	Jumlah
0- 4			
5- 9			
10-14			
15-19			
20-24			
25-29			
30-34			
35-39			
40-44			
45-49			
50-54			
55-59			
60-64			
65+			

### Sejarah Singkat Migrasi Kampung Ini.

11. Penduduk disini berasal dari mana?

12. Apa nama lokasi kampung ini?

13. Sebelum pindah kesini, dimana lokasi asal kampung ini?

Tahun berapa, kampung ini pindah kesini?

Apa sebab kampung ini pindah dari lokasinya?

14. Mohon ceritakan sejarah perpindah<sup>2</sup>an kampung ini.

Pindah dari:	Tahun Pindah	Alasan Pindah

15. Selama lima tahun yang lalu, berapa keluarga baru pindah ke kampung ini?

16. Selama lima tahun yang lalu, berapa keluarga yang pindah dari kampung dari sini ke kampung lain?

17. Selama lima tahun yang lalu, berapa orang laki<sup>2</sup> yang pindah dari kampung ini mencari pekerjaan tetap?

18. Selama lima tahun yang lalu, berapa orang perempuan yang pindah dari kampung ini mencari pekerjaan tetap?

21

### Luas Kampung

19. Tolong diberitahu dimana batas antara kampung ini dengan kampung tetangga.

Kampung Tetangga	Batas	Jauh dari disini

20. Tolong diberitahu nama<sup>2</sup> kampung yang mencari penghasilan dari hutan sekeliling kampung ini serta apa/berapa penghasilan yang diambil.

Kampung	Penghasil Diambil	Berapa Rombongan per tahun

80



Fasilitas di Kampung ini

25. Bangunan di kampung ini:

Bangunan	Berapa	Bahan Bangunan
Rumah <sup>2</sup> an		
Lumbung padi		
Mesjid/gereja		
Toko/warung		
Jamban		
Sekolah SD		
Sekolah SMP		
Puskesmas		
Rumah adat		
Kantor		
Lembaga Musyawarah Desa		
Lembaga Ketahanan Masyarakat Desa		
Bangunan yang lain - (buat daftar)		

26. Fasilitas yang lain:

Listrik

Air minum

dan lainnya

82

## Pekerjaan Laki<sup>2</sup>

Nama responden

Desa/dusun apa

1. Tolong ceritakan jenis<sup>2</sup> pekerjaan laki<sup>2</sup> yang penting dalam tiap bulan

Bulan	Paling Utama	Kedua	Ketiga
Agustus			
September			
Oktober			
November			
Desember			
Januari			
Februari			
Maret			
April			
Mai			
Juni			
Juli			

## Hasil Sungai<sup>2</sup>

2. Tolong ceritakan nama ikan/binatang air yang dicari laki<sup>2</sup> di sungai sekitar daerah ini

Jenis Ikan/Binatang	Pakai apa	Didapatkan berapa sering	Dicari pada Bulan <sup>2</sup>

82

3. Pernah pakai racun untuk mencari ikan?

Kalau ya, racun apa yang dipakai

4. Adakah orang lain memakai racun untuk mendapat ikan disungai sekitar daerah ini?

Kalau ya, kira<sup>2</sup> berapa kali setahun

5. Pernah pakai bahan letupan untuk mendapat ikan?

Kalau ya, kira<sup>2</sup> berapa kali setahun

6. Adakah orang lain memakai bahan letupan untuk mendapat ikan disungai sekeliling?

Kalau ya, kira<sup>2</sup> berapa kali setahun

**Hasil Hutan**

7. Apa pohon<sup>2</sup> kayu atau bahan<sup>2</sup> lain yang dibahan anda.

Pohon kayu	Digunakan untuk apa	Berapa sering diambil	Bulan <sup>2</sup> apa diambil

8. Tolong ceritakan semua binatang liar yang buru atau dicari laki<sup>2</sup> untuk makan

Binatang liar	Berapa sering didapat	Bulan <sup>2</sup> apa dicari

9. Tolong ceritakan hasil hutan apa saja yang diambil untuk makan

Hasil Hutan yang Bisa Dimakan	Berapa sering diambil	Bulan <sup>2</sup> apa dicari

10. Tolong ceritakan hasil<sup>2</sup> hutan yang diambil laki<sup>2</sup> untuk jual

Hasil Hutan yang dijual	Jual berapa pertahun	Hasil berapa per tahun	Bulan <sup>2</sup> apa dicari

11. Tolong ceritakan hasil<sup>2</sup> hutan yang diambil laki<sup>2</sup> untuk penggunaan lain seperti obat<sup>2</sup>an, cat anyam dan sebagainya.

Hasil Hutan untuk Penggunaan Lain	Berapa diambil pertahun	Bulan <sup>2</sup> apa dicari



### Pekerjaan Perempuan

Nama responden \_\_\_\_\_

Desa/dusun apa \_\_\_\_\_

1. Tolong ceritakan jenis<sup>2</sup> pekerjaan perempuan yang penting dalam tiap bulan

Bulan	Paling Utama	Kedua	Ketiga
Agustus			
September			
Oktober			
November			
Desember			
Januari			
Februari			
Maret			
April			
Mai			
Juni			
Juli			

**Hasil Sungai<sup>2</sup>**

2. Tolong ceritakan nama ikan/binatang air yang dicari perempuan di sungai sekitar daerah ini

Jenis Ikan/Binatang	Pakai apa	Didapatkan berapa sering	Dicari pada Bulan <sup>2</sup>

*88*

3. Pernah pakai racun untuk mencari ikan?

Kalau ya, racun apa yang dipakai

4. Adakah orang lain memakai racun untuk mendapat ikan disungai sekitar daerah ini?

Kalau ya, kira<sup>2</sup> berapa kali setahun

5. Pernah pakai bahan letupan untuk mendapat ikan?

Kalau ya, kira<sup>2</sup> berapa kali setahun

6. Adakah orang lain memakai bahan letupan untuk mendapat ikan disungai sekeliling?

Kalau ya, kira<sup>2</sup> berapa kali setahun

#### Hasil Hutan

7. Apa pohon<sup>2</sup> kayu atau bahan<sup>2</sup> lain yang anda pakai.

Pohon kayu	Digunakan untuk apa	Be:apa sering diambil	Bulan <sup>2</sup> apa diambil

8. Tolong ceritakan semua binatang liar yang buru atau dicari perempuan untuk makan

Binatang liar	Berapa sering didapat	Bulan <sup>2</sup> apa dicari

9. Tolong ceritakan hasil hutan apa saja yang diambil untuk makan

Hasil Hutan yang Bisa Dimakan	Berapa sering diambil	Bulan <sup>2</sup> apa dicari

10. Tolong ceritakan hasil<sup>2</sup> hutan yang diambil perempuan untuk jual

Hasil Hutan yang dijual	Jual berapa pertahun	Hasil berapa per tahun	Bulan <sup>2</sup> apa dicari

11. Tolong ceritakan hasil<sup>2</sup> hutan yang diambil perempuan untuk penggunaan lain seperti obat<sup>2</sup>an, cat anyam dan sebagainya.

Hasil Hutan untuk Penggunaan Lain	Berapa diambil pertahun	Bulan <sup>2</sup> apa dicari

Pemilikan pohon<sup>2</sup> kayu di hutan atau nilai bahan<sup>2</sup>.

12. Bagaimana cara memiliki pohon<sup>2</sup> kayu oleh orang setempat?

13. Siapa saja yang bisa bikin tanda hak milik pada pohon<sup>2</sup> kayu hutan dan bahan<sup>2</sup> lainnya.

14. Ada kerajinan tangan dibikin pada perempuan untuk jual?

Kalau ya, tolong ceritakan

Kerajinan Tangan	Dimana Jual	Berapa Jual pertahun	Harga Satu, Berapa

15. Bagaimana pemikiran ibu<sup>2</sup> tentang masalah<sup>2</sup> dan kesulitan penghidupan masyarakat setempat

16. Bagaimana pemikiran ibu<sup>2</sup> tentang tujuan kemajuan atau pengembangan masyarakat di kampung ini

**Kwestioner dengan kelompok tani, dengan keluarga yang miskin, yang berhasil dan dengan yang rata rata**

Nama responden

Nama desa/dusun

**Hasil Panen**

1. Biasanya, areal luas ladang dibikin sesuatu keluarga, kira kira berapa? (jika wawancara dengan kelompok, ladang dibikin keluarga yang sedang. Nyadi keluarga sedang adakah - ibu/bapak, satu anak perempuan sudah dewasa, 2 anak lagi)
2. Biasanya, berapa tahun orang mengerjakan ladang sebelum pindah ke lokasi baru?
3. Sekarang ini, kira kira berapa tahun orang akan kembali mengerjakan ladang sebelumnya
4. Pada umumnya, selama sepuluh tahun, berapa kali menebang pohon<sup>2</sup> rimba untuk berladang
5. Bagaimana luas tanah, cukup atau kurang
6. Pada tahun yang lalu, hasil panen cukup untuk berapa bulan?  
  
Orang miskin mendapat cukup untuk berapa bulan makan  
  
Orang berhasil mendapat cukup untuk berapa bulan makan
7. Pada tahun yang rata<sup>2</sup>, kampung ini mendapat padi cukup untuk berapa bulan makan

8. Selama sepuluh tahun yang lalu, berapa hasil panen kampung ini

	Berapa Tahun
Lebih dari cukup	
Cukup makan	
Kurang	

9. Bagi keluarga biasa, kirakira berapa kebutuhan padi harus diperoleh supaya cukup untuk makan

kirakira berapa padi diperoleh supaya cukup untuk penggunaan yang lain seperti makanan unggas

10. Jika penghasilan kurang, diganti dengan apa?

#### Jenis<sup>2</sup> Tanaman Diladang

11. Orang menanam apa - sesudah membakar ladang tapi belum nugal

sementara atau sudah nugal

sudah panen

12. Apa yang ditanam di halaman?

13. Di kebun, orang menanam apa?

14. Untuk berkebun, kira kira berapa luas tanah bagi satu keluarga

15. Pohon<sup>2</sup> buah apa saja yang ditanam keluarga<sup>2</sup> disini?

Ditanam dimana?

95

16. Apa kesulitan orang disini dalam berladang

Kesulitan	Berat	Sedang	Tidak
Tanah tidak subur			
Rumput terlalu banyak			
Tanah erosi			
Diganggu binatang liar			
Diganggu serangga			
Penyakit padi			
Yang lainnya (sebutkan)			

17. Orang memelihara unggas dan ternak apa?

Ternak/Unggas	Cara memelihara, dikurung atau dilepas	Makan apa?	Pada umumnya, keluarga mempunyai berapa ekor

18. Apa masalah yang dihadapi berkenaan dengan memelihara ternak?

96

19. Pada umumnya, keluarga mendapat uang dari jual apa?

Jual apa	Dimana dijual	Jual berapa pertahun	Berapa penghasilan pertahun
<u>Kerajinan Tangan</u>			
<u>Hasil Hutan</u>			
<u>Hasil Tani</u>			
<u>Hasil kebun</u>			
<u>Hasil Tenaga Kerja</u>	<u>Kerja apa</u>	<u>Berapa bulan kerja pertahun</u>	<u>Gaji berapa</u>

20. Uang yang dimiliki dipergunakan untuk keperluan apa saja

Kebutuhan	Membeli berapa perbulan	Harga
Ongkos perjalanan ke pasar		
Garam		
Gula		
Sabun		
Odol		
Teh		
Kopi		
Rokok		
Minuman kaleng		
Minyak goreng		
Minyak tanah		
Biaya anak disekolah		
Bensin		
	<u>Membeli berapa pertahun</u>	
Pakaian dan sepatu		
Beras		
Minyak wangi		
Makanan		
Tabungan		
dan lainnya: (sebutkan)		

21. Dalam satu tahun, kira<sup>2</sup> berapa jumlah uang agar cukup untuk semua kebutuhan pada salah satu keluarga
22. Berapa orang didusun ini yang mempunyai:

Kekayaan	Berapa orang mempunyai
Ketinting	
Televisi	
Radio	
Jam	
Sepeda	
Sepeda motor	
Barang <sup>2</sup> mas	

23. Menurut ibu/bapak, apa masalah<sup>2</sup> dan kesulitan penghidupan masyarakat disini

24. Apa harapan ibu/bapak agar masyarakat disini maju dan berkembang

25. Menurut ibu/bapak, bagaimana kesempatan masyarakat disini untuk mendapat uang. Cukup atau tidak.

Kalau tidak, ceritakan mengapa.

## APPENDIX 3 COMMUNITY PROFILES

### SITE DESCRIPTION

Village name	* Tumbang Habangoi
Kecamatan	Senamam Mentikei
Kabupaten	Kota Waringan Timur
River	Habangoi
Group	Ot Danum
Sub-group	Dohoi
Language/dialect	Dohoi
Religion	Kaharingan
Population	
males	271
females	248
total	519
Number of households	96
Number of houses	48
Village head	Lion Tue

### Migration

The migration route of the Dohoi resident in Habangoi originated in Tumbang Bereo, thence through Melawi and Merantau in Kalimantan Barat and then to Menyahei and then to the present location. They moved across the watershed to flee a war in the Sintang area between the Dutch and the local Dayaks known as Perang Paku. They moved to their present location in about 1959 to amass a larger population so that the Government would situate a school in the village.

### Boundaries

The boundary with the downstream kampung, Sekutau is at Tumbang Ranjang which is about 15 minutes downriver using a kelotok when the river is in flood.

## DEMOGRAPHY

The demographic distribution of the population (August 1992) is given below:

Males			Females	Total
44	0	4	48	92
34	5	9	46	80
39	10	14	30	69
35	15	19	20	55
20	20	24	22	42
19	25	29	17	36
13	30	34	20	33
18	35	39	12	30
13	40	44	9	22
10	45	49	10	20
6	50	54	2	8
11	55	59	4	15
5	60	64	5	10
4	65	+	3	7
271			248	519

There has been negligible immigration into the village or emigration from the village during the last five years.

### Primary Forest

Habangoi is located within a forest concession of PT Handayani. It is uncertain how far the village is from any protected forest, although most households claim that they are cutting down primary forest for the purposes of swidden agriculture. Much of this forest area, however, is in the concession area of PT Handayani and is accessed along the forest roads constructed by Pt. Handayani.

### Subsidiary Streams Upriver

Not known

## MAIN ECONOMIC ACTIVITIES

### Swidden Agriculture

Main subsistence is hill rice procured from dry ladang, either cut from primary forest or from secondary growth over 7 years old. With the rice are sown catch crops of various kinds of vegetables, principal of which are maize, cucumber, sugar cane, spinach and cassava. Currently either at the end of the season or during it, rotan seed are planted in the ladang, resulting in the ladang becoming kebun and therefore taken out of the bush/fallow cycle.

Average farm size is of the order of 1.53 ha. (from a very small sample) and 0.67 ha. per adult.

Livestock owned are pigs, fowl and duck. Fowl are sold to the local timber camp, usually on a barter basis as are vegetables and fruit.

Major sources of income are from the sale of rotan and ironwood roof shingles. The rotan is usually sourced from kebun and is sold wet to traders. Current prices are about Rp. 22,000 per pikul.

Pt Handayani has provided few opportunities for employment by members of Habangoi households.

## **Forest Extraction**

### Wood

There are 4 chainsaws owned by households in the village. In addition, villagers will hire the use of chainsaws operated by PT Hadayani workers. The chainsaws are used to open up ladang from the forest, to saw planks from meranti and to cut down Kayu ulin trees and make balok or to leave the trees so that others can make sirap using wedges.

### Bark

Many houses and most pondok built in ladang are clad in bark. meranti is the preferred tree for bark.

### Illipe Nut

The market for illipe nut is largely underdeveloped in Kalimantan Tengah. Prices therefore are not attractive enough for people to collect and process the nut for sale. Nuts are collected to extract the oil for domestic cooking purposes. Occasional households do collect the nuts for sale in Tumbang Samba.

### Rattan

Rattan which is sold is predominantly collected from rattan gardens. Essentially, forest rattans are too distant to make it economically attractive for villagers to collect it. The forest is, however used as a source for rattan seed.

### Gaharu

Gaharu appears to be virtually exhausted in the area. Consequently, there is little economic activity in this area.

## **MINOR ECONOMIC ACTIVITIES**

### Handicrafts

A small amount of handicrafts are made by women for sale to Handayani employees. They consist of simple rattan mats and baskets. There is no other market which has been developed for handicrafts.

Music is very strong in the village with a number of accomplished (guitar), rebab and suling players and singers. The traditional orchestra has a major potential if a tourist market is developed.

## Gold

Gold is panned by many households. It is a female activity and can yield up to 2 oz. per day. Most women work in a group and the product is divided equally among the group.

## Hunting

Hunting predominantly targets the bearded pig, though any other animal which is chanced upon would be taken. Men predominantly hunt, though some women will join in so that their households will obtain a share in any catch. Air rifles with shot soaked in a combination of balsam oil and lime or spears and dogs are used to catch prey. There was little evidence that traps and snares were being used.

## **SITE DESCRIPTION**

Village name	Tumbang Malawan
Kecamatan	Merikit
Kabupaten	Kota Waringan Timur
River	Tumbang Hiran
Group	Ot Danum
Sub-group	Dohoi
Language/dialect	Dohoi (Sebaung)
Religion	Kaharingan
Population	
males	87
females	86
total	173
Number of households	37
Number of houses	18
Village head	Adung

## **Migration**

The migration route of the Dohoi resident in Malawan originated in the Melawi. Memories of the route into Kalimantan Tengah were vague. The present village moved from Tumbang Pesung in the Samba river to Malawan in about 1971. No one remembers why they moved to the present location.

## **Boundaries**

The boundary with the downstream kampung, Tumbang Tahei is at Tumbang Busi which is about 4 kilometres downriver. The former upriver boundary with Sebaung was just above Tumbang Papak which is the fifth named stream flowing into the Hiran above the present location of Malawan. It is about one and a half hours upriver by kelotok.

## DEMOGRAPHY

The demographic distribution of the population (August 1992) is given below:

Males			Females			Total
12	0	4	18		30	
15	5	9	15		30	
14	10	14	10		24	
10	15	19	8		18	
7	20	24	8		15	
5	25	29	6		11	
5	30	34	5		10	
3	35	39	6		9	
9	40	44	3		12	
6	45	49	3		9	
0	50	54	0		0	
0	55	59	0		0	
0	60	64	1		1	
1	65	+	3		4	
87			86		173	

Two households have moved into the village in the last five years - one a Malay from the PutuSibau area who owns a chainsaw and uses it to generate an income from cutting and selling sawn timber to villagers and the second a Dohoi from Tumbang Hiran who has established himself as a trader, predominantly buying rotan basah, drying it and then transporting it downriver for sale in Tumbang Samba. The two households currently number 11 persons.

### Primary Forest

Malawan appears to be located within a forest concession of PT Dwima. It is uncertain how far the village is from any protected forest. Forest areas are usually accessed by taking a perahu up or downriver and then walking in from the river to the forest areas. A road recently constructed by PT Dwima will undoubtedly enhance forest access.

## Subsidiary Streams Upriver

	Pasangi
Pajangei	Kasak
Saranum	
Papak	Pesong
Leput	Parai
	Tanei
	Telunuk
Tumbang	Tumbang
Segirik	Kampil
	Buho
Sabanban	
	Uroi
MALAWAN	

## MAIN ECONOMIC ACTIVITIES

### Swidden Agriculture

Main subsistence is hill rice procured from dry ladang, either cut from primary forest or from secondary growth over 7 years old. With the rice are sown catch crops of various kinds of vegetables, principal of which are maize, cucumber, sugar cane, spinach and cassava. Currently either at the end of the season or during it, rotan seed are planted in the ladang; resulting in the ladang becoming kebun and therefore taken out of the bush/fallow cycle.

Average farm size is of the order of 0.89 ha. and 0.36 ha. per adult.

Livestock owned are unggal cattle, pigs, fowl and duck. Fowl are occasionally sold to visiting traders and government officials. Other livestock are predominantly owned for ritual purposes, though cattle are occasionally traded when a market materialises.

Major sources of income are from the sale of ironwood roof shingles and rotan. The rotan is usually sourced from kebun and is sold wet to traders. Current prices are about Rp. 22,000 per pikul. Another major source of income in the village, though it is enjoyed by only two households, is through trading rotan and timber products downriver.

Pt Dwima has provided no opportunities for employment by members of Habangoi households.

### Forest Extraction

#### Wood

There are 3 chainsaws owned by households in the village. The chainsaws are used to open up ladang from the forest, to saw planks from meranti and to cut down Kayu ulin trees and make balok or to leave the trees so that others can make sirap using wedges.

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### Bark

Many houses and most pondok built in ladang are clad in bark. Meranti is the preferred tree for bark.

### Illipe Nut

The market for illipe nut is largely underdeveloped in Kalimantan Tengah. Prices therefore are not attractive enough for people to collect and process the nut for sale. Nuts are collected to extract the oil for domestic cooking purposes. Occasional households do collect the nuts for sale in Tumbang Samba.

### Rattan

Rattan which is sold is predominantly collected from rattan gardens. Essentially, forest rattans are too distant to make it economically attractive for villagers to collect it. The forest is, however used as a source for rattan seed.

### Gaharu

Gaharu appears to be virtually exhausted in the area. Consequently, there is little economic activity in this area.

## **MINOR ECONOMIC ACTIVITIES**

### Handicrafts

Handicrafts like mats and baskets are only made and sold for internal trade within the village.

Music is very strong in the village with a number of accomplished (guitar) players and singers, which has a major potential if a tourist market is developed.

### Gold

Gold is panned by many households. It is a female activity and can yield up to 2 oz. per day. Most women work in a group and the product is divided equally among the group.

### Hunting

Hunting predominantly targets the bearded pig, though any other animal which is chanced upon would be taken. Men predominantly hunt, though some women will join in so that their households will obtain a share in any catch. Air rifles with shot soaked in a combination of balsam oil and lime or spears and dogs are used to catch prey. There was little evidence that traps and snares were being used.

## SITE DESCRIPTION

Village name	Sebaung
Kecamatan	Merikit
Kabupaten	Kota Waringan Timur
River	Tumbang Hiran
Group	Ot Danum
Sub-group	Dohoi
Language/dialect	Dohoi (Sebaung)
Religion	Kaharingan
Population	
males	51
females	66
total	117
Number of households	20
Number of houses	9
Village head	Idur

## Migration

The migration route of the Dohoi resident in Sebaung originated in the Melawi. Memories of the route into Kalimantan Tengah were vague. The present village moved from the Samba' river to Sebaung Lama in distant memory. It then moved to its present location adjoining Malawan in about 1971. The reason they moved was to make a bigger village and thence to obtain better government services like a school.

## Boundaries

The traditional boundary with the downstream kampung, Malawan is at Tumbang Papak which is the fifth named stream flowing into the Hiran above the present location of Sebaung. It is about one and a half hours upriver by kelotok.

## DEMOGRAPHY

The demographic distribution of the population (August 1992) is given below:

Males		Females		Total
6	0	4	17	23
8	5	9	17	25
8	10	14	8	16
9	15	19	3	12
4	20	24	5	9
2	25	29	3	5
1	30	34	5	6
3	35	39	3	6
3	40	44	2	5
4	45	49	1	5
1	50	54	0	1
0	55	59	2	1
2	60	64	0	2
0	65	+	0	0
51			66	117

One household has moved into the village in the last five years to join his brothers-in-law.

### Primary Forest

Sebaung appears to be located within a forest concession of PT Dwima. It is uncertain how far the village is from any protected forest. Maps certainly indicate that Sebaung Lama is located within the boundaries of the Bukit Raya National Park. Farming continues some 2 hours upriver by kelotok from Sebaung Lama. Undoubtedly reasonably mature forest is being cut, the farmers maintain that it is 50 year old forest which indicates former farming in the area and undoubtedly interests in old forest groves and, possibly old graveyards and other traditional areas.

### Subsidiary Streams Upriver

	Pasangi
Pajangei	Kasak
Saranum	
Papak	Pesong
Leput	Parai
	Tanci
	Telunuk
Tumbang	Tumbang
Segirik	
	Kampil
	Buho
Sabanban	
SEBAUNG	Uroi

## MAIN ECONOMIC ACTIVITIES

### Swidden Agriculture

Main subsistence is hill rice procured from dry ladang, either cut from primary forest or from secondary growth over 7 years old. With the rice are sown catch crops of various kinds of vegetables, principal of which are maize, cucumber, sugar cane, spinach and cassava. Currently either at the end of the season or during it, rotan seed are planted in the ladang, resulting in the ladang becoming kebun and therefore taken out of the bush/fallow cycle.

Average farm size is of the order of 1.27 ha. and 0.45 ha. per adult.

Livestock owned are unggal cattle, pigs, fowl and duck. Fowl are occasionally sold to visiting traders and government officials. Other livestock are predominantly owned for ritual purposes, though cattle are occasionally traded when a market materialises.

Major sources of income are from the sale of ironwood roof shingles and rotan. The rotan is usually sourced from kebun and is sold wet to traders. Current prices are about Rp. 22,000 per pikul. Another major source of income in the village, though it is enjoyed by only two households, is through trading rotan and timber products downriver.

Pt Dwima has provided no opportunities for employment by members of Habangoi households.

### Forest Extraction

#### Wood

There are no chainsaws owned by households in the village, though households have access to the chainsaws owned by Malawan households.

#### Bark

Many houses and most pondok built in ladang are clad in bark. Meranti is the preferred tree for bark.

#### Illipe Nut

The market for illipe nut is largely underdeveloped in Kalimantan Tengah. Prices therefore are not attractive enough for people to collect and process the nut for sale. Nuts are collected to extract the oil for domestic cooking purposes. Occasional households do collect the nuts for sale in Tumbang Samba.

#### Rattan

Rattan which is sold is predominantly collected from rattan gardens. Essentially, forest rattans are too distant to make it economically attractive for villagers to collect it. The forest is, however used as a source for rattan seed.

#### Gaharu

Gaharu appears to be virtually exhausted in the area. Consequently, there is little economic activity in this area.

## MINOR ECONOMIC ACTIVITIES

### Handicrafts

Handicrafts like mats and baskets are only made and sold for internal trade within the village.

Music is very strong in the village with a number of accomplished (guitar) players and singers, which has a major potential if a tourist market is developed.

### Gold

Gold is panned by many households. It is a female activity and can yield up to 2 oz. per day. Most women work in a group and the product is divided equally among the group.

### Hunting

Hunting predominantly targets the bearded pig, though any other animal which is chanced upon would be taken. Men predominantly hunt, though some women will join in so that their households will obtain a share in any catch. Air rifles with shot soaked in a combination of balsam oil and lime or spears and dogs are used to catch prey. There was little evidence that traps and snares were being used.

## APPENDIX 4 NAMED RICE STRAINS

Rice		Glutinous Rice	
Malawan/Sebaung	Habangoi	Malawan/Sebaung	Habangoi
Kapuas	Kapuas Tengai Bidai Panyapoi Hara Mohor Kajan Pangiran Campur		<b>Duloi Manjuhan Ilum Kambang Hawoi Bendang Mutahi Lango Urak Juah Biji Kecil Jambu Anak Lauk</b>
Uwan	Uwan Kerian Biji Kecil Ngapat Erang Rendah Haju		
Garo	Garo Saluang Murik Uhat Belawan Bendera Seribu	<b>Ketan Karahau Kutilang Babilem Taraus Bajang Kita'</b>	
Tiung Santan Nyaring Hara' Manyang Rigci Panahan Tabakang Siwau Anak Tahuman Jarangan			

## APPENDIX 5 VEGETABLES AND FRUIT CULTIVATED

Vegetables	Fruit
Bawang da (bumbu)	Beruku
Bawang riting (bumbu)	Cempedak
Bayam	Coklat
Ensawi	Durian
Entimun	Jambu asam
Jagung	Jambu biji
Jahe (bumbu)	Kelapa
Kacang panjang	Kelapa sawit
Kangkong	Kopi
Karawila (jampau, lempang)	Langsat
Katuk	Mangga
Keladi	Mangis
Kemeri	Nanas
Kencur (bumbu)	Nangka
Kunyit (bumbu)	Paken
Labu puteh	Papaya
Labu merah	Pisang
Laos	Pinang
Lombok	Rambutan
Pare	Sibau
Rebong	Sirih
Sawi	Tabulus
Sayur manis	Tangaring
Semangka	Tengkawang
Serai	
Tebu	
Terong asam (rimbang)	
Terong biasa	
Ubi jalar	
Ubi kayu	
Ubi rambat (gembili)	

## APPENDIX 6 FOREST PRODUCTS

### A. Aquatic Life

Species	Females	Males		
	How caught?	How caught?	Frequency	Season
Sapan	Rengge	Mancing	Jarang	Hujan Kering Kering
Seluang	Mancing	Saup	Sering	
Kelisi		Tangan	Sering	
Palau		Saup	Sering	
Pantik	Umpan	Mancing	Jarang	
Kodok		Menyuar	Jarang	
Banta	Merawai	Mancing	Jarang	
Tampahas	Mancing,	Satawan	Jarang	
Lewang	Merawai	Mancing	Jarang	
Barakas		Mancing	Jarang	
Leket	Rengge	Mancing	Jarang	
Juah		Mancing	Jarang	
Joli	Pukat	Mancing	Jarang	
Rakong		Mancing	Jarang	
Baung		Jarang	Jarang	
Manjuhan	Pukat	Renge	Jarang	
Suhoi	Rengge	Sauk,puket	Jarang	
Bilih	Rengge,			
Kujut	Merawai			
Sajo				
Pohing	Mancing			
Masau	Mancing			
Dungan	Mancing			
Kura2	Merawai			
Bidawang	Rengge			
Tabalang	Tombak			
	Tombak			
	Mancing			

C. Wildlife

Species	Frequency	Months sought
<p><b>Males</b>            Bearded pig            Sambur deer            Barking deer            Python            Monitor lizard            Burung sahkan            Argo pheasant            Crow            Honey bear            Marbled cat            Mouse deer            Porcupine            Civet            Pangolin            Kelasi</p> <p><b>Females</b>            Frog            Pigeon            Burung pampulu</p>	<p>Infrequently</p>	<p>Whole year</p>

## D. Forest Vegetables and Fruit and Products for Sale

Vegetables	Fruit	Forest Products for Sale
Petai	Embak (baccaurea)	Rattan for weaving
Bengkel	Puak	Rattan
Jaring (jengkol)	Durian Lahung	Truffles
Ujau betung (rebung)	Durian Tokoi	Ferns
Ujau puring (rebung)	Durian Tingang	Bamboo shoots
Ujau manis (rebung)	Rambutan	Palm crowns
Kalakai putih (paku)	Tanggung	Cempedak
Kalakai merah (paku)	Langsat	Ironwood
Bajei (paku)	Paken	Pantung
Kulat putih (jamur)	Umbing	Meranti
Kulat jelang (jamur)	Keliwan	Fish
Kulat ragi (jamur)	Mentawa	Fruit
Kulat maharu (jamur)	Mankahai (cempedak)	Illipe nut
Kulat bitak (jamur)	Nangka	Gaharu
Kulat Karitip (jamur)	Sibau	Bearded pig
Kulat siau (jamur)	Tangkuhis	
Kulat sipa (jamur)	Hampalan	
Kulat lepan (jamur)	Asam Tewu	
Kulat rigei (jamur)	Lepis	
Singkah wei (umbut)	Manggis	
Singkah pandung (umbut)	Jambu Ratih	
Singkah edan (umbut)	Jambu Agung	
Singkah marau (umbut)	Jambu Behas	
Singkah satowon (umbut)	Matan Tingang	
Singkah juang (umbut)	(baccaurea)	
Singkah lesum (umbut)	Titeda	
Singkah enyuh (u/kelapa)	Tekuk	
Singkah nange (umbut)	Sangalang	
Singkah hambic (umbut sago)	Dara	
Singkah lisi (umbut)	Lanamun	
Singkah kalamenyu (umbut)	Karapai	
Singkah boho (umbut)	Karamu	
Singkah rige (umbut)	Salintik	
Singkah diwung (umbut)	Marau (rotan)	
Singkah kumbai (umbut)	Enyak Beruk	
Toe bawie	Puyakan	
Weh (daun salam)	Kapok	
Langkawit	Lampesung	
Saduru	Tekuk Sambuk	
Mangkahai (Cempedak)	Katiau	
Daun hindu	Rambai	
Daun beken	Suli	
Daun ruas	Pilang	
Daun panahan	Bodot	
Sepang	Tete Edan	
Bambang	Dango	
Hanau	Salak Hutan	
Kalan ketemu		
Mananjung		

## Forest Products for Other Uses

### Medicinal

Saluang belum (evodia sp.)	General health
Akar kuning	Jaundice
Ramoi (mucuna biplicata)	Dysentery
Tikang siau	General Health
Pasak bumi (curycoma longifolia)	General Health
Akar penawar gantung	Malaria
Panahan	Virility
Tabat barito	Contraception
Sasendok	Contraception
Belawan	General health
Paku hati	Irascibility
Saramuhing	Afterbirth
Lempang danung	Childbirth
Suli air	Menstrual problems
Tawas ut	General health
Sawang	Veins
daha/bahandang/kalop	Contraception
Pacar air	Dysentery
Tanreket	
Karamunting puteh	Contraception
Kembang sepatu	
Iru puteh	Dermatitis
Tawar seribu	Dry skin
Kayu galung	
Kulit buah sengalang	
Bungoh pemace daha (psychotria)	Contraception
Lunuk	General health
Tabalien manang	General health
Rumput puteh	Fever
Owei tukan	Additive
Tahkun paroic	Fever, backache, prostate
Jeroping	Fever, veins, backache
Siraja bangun	Eternal youth
Tuwon sahawun	Poison antidote
Sekatop buwu	Backache
Pengaletut	Haemorrhaging

### Dyes

Woi Jerenang	Red dye
Daun siwau	Black dye
Daun tahum	Black dye

### Poison for Fishing

Tuc chang	Leaves
Tuc pahi	Bark
Tuc pari	Roots
Tuc bua	Leaves
Tuc bajakah	Roots



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NO.	TITLE	AUTHOR
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4.	Applied Research Recommendations for Production Forest Management An Economic and Ecological Review of the Indonesian Selective Cutting and Replanting System (TPTI)	Lisa Curran & Monica Kusneti
5.	Balancing Forest and Marine Conservation with Local Livelihoods in Kalimantan and North Sulawesi	Jill M. Belsky
6.	Proposal to the GOI and USAID for the Development of Comprehensive Environmental and Natural Resources Accounts (CENRA) for Economic Planning and Management	Henry Peskin & Joy Hecht
7.	Bukit Baka Mini-Hydraulic System Implementation Plan	Michael Johnson
8.	Final Report: Bukit Baka – Bukit Raya 1992	Roy Voss
	Station Protocol: Bukit Baka – Bukit Raya 1992	Roy Voss
	Research Protocol: Bukit Baka – Bukit Raya 1992	Roy Voss

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NO.	TITLE	AUTHOR
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10.	Recommendations for Controlled Timber Harvesting in the SBK Forest Concession	John Hendrison
11.	Cruiser Identifications at SBK and Local Uses of Trees by Local People	Jim Jarvie
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13.	Report on NRM Library Consultancy September – December 1992	Dachlan Cartwright
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15.	A Competitive Awards Scheme for Applied Forest Management and Nature Conservation	Peter R. Burbridge
16.	Design of a Management Information System for the Natural Resources Management Project	Joy Hecht
17.	Environmental Education and Awareness Strategy for Bukit Baka – Bukit Raya National Park (volume 1)	Nancy Bergau
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18.	Water Supply and Sanitation (WS&S) Program in Bukit Baka – Bukit Raya, Kalimantan Program Status Report	Rick McGowan

NO.	TITLE	AUTHOR
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	Management Information System for the Natural resources Management Project User Manual and Technical Documentation (Volume 2)	Joy Hecht
24	Water Supply and Sanitation Program in Bukit Baka – Bukit Raya, Kalimantan Status Report No. 2	Jonathan Hodgkin