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Forest, Science and Sustainability:
The Bulungan Model Forest




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6. People's Dependencies on Forests

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Introduction

Diversity and change

It is widely accepted that forest people in remote areas such as Bulungan are highly dependent on forests and on forest products for their livelihood and even for their survival. The district of Malinau in East Kalimantan where the Bulungan Research Forest is located presents one of the largest remaining lowland dipterocarp forests in Asia. It also hosts various Dayak ethnic groups and one of the largest remaining populations of hunter-gatherers in Asia: the Punan. In the past, both groups totally depended on the forest for their subsistence. The Dayak are generally considered as agriculturists, practicing swidden cultivation of upland rice, while the Punan are generally considered to be predominantly nomadic hunter-gatherers. This distinction is convenient but does not stand up to in-depth analysis. Some Dayak ethnic groups do not differ much from the Punan, and over time some groups opt temporarily for hunting and gathering before reverting to swidden cultivation. Nowadays, the line between swidden agriculturists and hunter-gatherers is even more blurred (King 1993; Cleary and Eaton 1992). Most Dayak collect forest products during slack periods in the agricultural timetable, while most Punan open swiddens on a regular basis. Again, a head of household can practice hunting-gathering during an early part of his life cycle and later opt for swidden cultivation. Furthermore, some heads of households no longer either own swiddens or collect forest products.

The forest remains of paramount importance to the entire local population. Any Dayak or Punan will be able to name dozens of species of plants and of animals of economic importance to them (Puri 2001). Forest products provide subsistence goods (staple food, vegetables, fruit, game and fish), cash income (eaglewood, bezoar stones, rattan, resins and gums) and building materials and medicinal plants. The forest as a whole is also essential to the sustainability of the swidden agriculture cycle. After one to two years of rice cropping, the swiddens are turned into a bush fallow for 10 to 20 years before being slashed and burnt again. The shading provided by the trees helps the farmer to get rid of grassy weeds, while the slashing and burning provides free and abundant fertilizer. Without quick and vigorous forest regrowth, the swiddens would turn into grasslands, which have little economic value given the techniques and means locally available (Levang *et.al* 1997).

Considering the acknowledged importance of forests to local people, one can easily imagine that the Dayak and Punan would suffer most from deforestation. The loss of access to forests and forest resources would jeopardize their livelihood, force them to quit their traditional way of life and push them into utter destitution. Logically, forest people should be hardline conservationists. It does not take long while wandering around Bulungan to become convinced that they are not! It quickly appears that people only complain about deforestation by concessionaires as long as they do not get adequate compensation, and that 'investors' are welcomed all over the Bulungan Research Forest and beyond

Sago is no longer the main staple but it still serves as a safety net in time of crisis

(Obidzinski *et al*. 2001). Even remote villages of hunter-gatherers send emissaries to Tarakan in order to promote their forests to outside 'investors'.

This apparent contradiction gives rise to many questions. Has local people's dependency on forest products been overstated? Do some depend more than others on forest products? Is hunting-gathering a deliberate choice or the only available option? Are people considering other options for themselves or for their children? Who is taking advantage of ongoing changes? Who will be on the losing side?

Study sites

The Forests Products and People programme sought to understand the nature of the dependency of local communities on forests and particularly on non-timber forest products (NTFPs). The overall objective was to elucidate policies that would lead to more secure and sustainable livelihoods for these people. The impact of changing policies and external threats and opportunities for forest dependent peoples was given particular attention. Surveys focused mainly on the Bulungan Research Forest area but work extended into adjacent areas when this contributed to the understanding of issues. Most of the research was conducted in villages and hamlets in the Malinau and Tubu watershed. As the Long Loreh area had already been intensively studied by other CIFOR teams, and in order to avoid research fatigue, we gave priority to more remote upstream villages. These villages were also assumed to be more forest dependent.

When necessary, complementary surveys were carried out outside the area, as far as Malinau, Tarakan and Tanjung Selor. Work in these areas gave insights on forest dependence in areas which were more open to outside influence and contributed to a better understanding of future developments. Some comparative studies were launched in other districts of East Kalimantan, for instance in Berau, Kutai and Pasir.

Methods

While the overall objective — to assess the importance of the forest and of forest products to local people — is rather similar to that of the previous chapter, the viewpoint and methodology differ considerably. In the previous chapter, multidisciplinary methods were employed across the landscape in order to quantify and organize local values regarding fauna and flora into a hierarchy that could help guide management decisions. In this

chapter, the stress is put on forest products of economic importance to local people. The FPP team privileged ethnographic in-depth methods. Interviews with stakeholders were conducted using standard anthropological survey techniques such as closed, semi-open and open questionnaires. In some specific cases, the interpersonal skills of the consultant allowed the collection of fairly complete and precise data, especially from eaglewood traders and fishermen[1].

For household surveys we used a semi-open questionnaire, given to randomised samples of 30 families in the larger villages and exhaustive samples in villages with less than 30 households. The questions asked concerned family data, farming system characteristics, forest product collection, off-farm activities, and incomes and main expenditures. A more open part of the questionnaire inquired about biodata, perceptions and expectations of the head of household and of his wife. In a first stage, the household survey focused on five villages located along an upstream-downstream gradient in order to account for differences in access to forest resources, access to markets and ethnic diversity. The villages chosen were Long Jalan (a Punan community in the upper reaches of the Malinau River); further downstream, Tanjung Nanga (a Kenyah community with some Punan families) and Langap (an ancient Merap village); and in the lower reaches of the Malinau River, Pulau Sapi (a Lundayeh village which recently became the capital of the Mentarang Baru subdistrict) and Respen Sembuak (a resettlement village regrouping eight Punan villages, one Merap and one Abai village which were relocated in the early 1970s from the Tubu watershed). In the second stage, we focused more on the Punan hunter-gatherer villages and hamlets still remaining in the middle and upper Tubu. The comparison between these villages and the resettled ones in Respen Sembuak provide the most valuable information about the trade-offs and pay-offs linked to resettlement and to a reduction in dependency on forests and forest products. All household surveys were complemented by the collection of anthropological data.

The survey of marketing of forest products used a trading chain approach. The forest product was traced from its collection by hunter-gatherers, its buying and reselling by local traders through to wholesalers and exporters. The survey on the impacts of concessionaires on local people and the survey of wood utilization were carried out with the assistance of the major concessionaires in the study area: INHUTANI I and II, BDMS and the mining company John Holland.

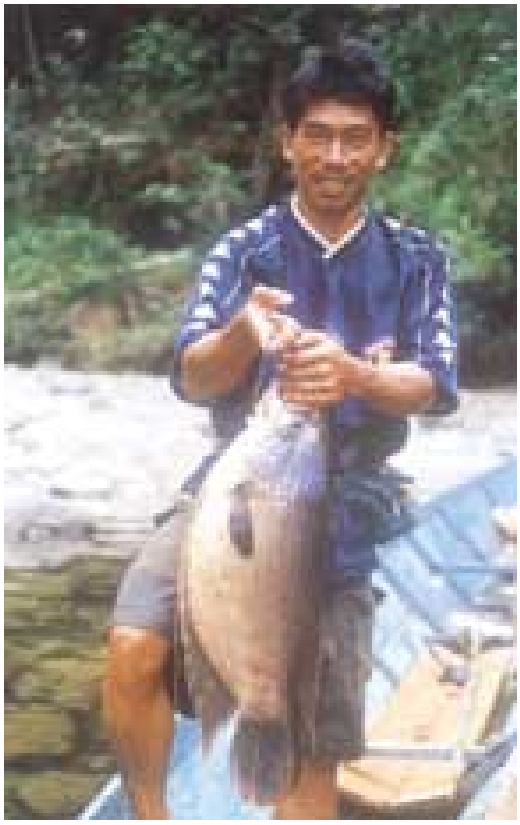
Anthropological data was collected through non-directive interviews of local people, with special attention given to village elders (men and women), heads of villages and *adat* and community leaders. Special emphasis was given to exchanges[2] among family members, neighbours and communities, to cultural aspects of economic activities, and to perceptions, wishes and visions of the future. Formal education and healthcare were given special attention as these two items emerged as the most important for local communities. Local government officials, religious leaders, teachers and development workers were often among the most relevant informants.

Results

1. Dependency on forest products for subsistence needs

The highest level of dependency on forest products for subsistence needs is found in the Punan villages of the upper Tubu. It takes four to five days by boat to reach Long Pada from Malinau. Because of the many rapids, only small boats can be used. Long-tail engines are preferred to outboard engines because the latter's propellers are too expensive. After heavy rains the rapids become too dangerous to pass and the boatmen prefer to wait for the water level to fall again. To pass some rapids the boats need to be unloaded first and then hauled through. The two villages upstream from Long Pada, Long Ranau and Long Nyau, can only be reached on foot via narrow and difficult paths.

Each village hosts about 20 families, all related to each other. Their way of life is still very traditional. Nearly all families open a swidden in primary or secondary forests once a year[3]. All work is carried out on a mutual aid basis by households organized in small neighbourhood groups (Issoufaly 2000). Agricultural activities are mainly limited to upland rice and cassava cultivation. Other crops like coffee, sugarcane, eggplants, cucumbers, peppers, etc. can be found in gardens close to the village but always in small numbers. Only very few households own orchards, generally in former settlement locations.



Fishing provides additional proteins...

In 2000–2001, the average size of a swidden was 1.4 ha and the average yield, 697 kg of paddy per ha. Only 34% of the households covered their staple food needs from the production of their swidden. On average, upland rice cultivation as locally practiced only requires 61 man-days per ha, which implies a rather high return to the man-day i.e. Rp. 15 500 per man-day. Hence, there is also plenty of time available for other activities.

The activity most favoured by men is wild boar[4] hunting. Every fit male aged 16 to 40 goes wild boar hunting on average three times a week. The hunt is organized on an individual or a very small group basis, generally two to three men with spears and three to six dogs. The hunt starts early in the morning and may last until mid-afternoon. The preference for bearded pig is due to its high fat content. In the upper Tubu, pig fat is generally the only source of fat in the diet. Roasted fat is also a feast for the gourmet. Catching anything other than a bearded pig is considered as being tantamount to returning empty-handed. For instance, hunters who catch a barking or a samba deer early in the morning kill it and abandon it in the forest. If they end up empty-handed in the afternoon they will come back to their prey and only take home the hindquarters and the antlers of the deer. Blowpipe hunting is a lonely activity reserved for specialists. Any living creature[5] in the forest becomes a target: birds, reptiles, monkeys and even bearded pig. Different species of plants are used to prepare poison[6] for blowpipe hunting. The hunted animals are always shared among all families in the settlement. Even short-term visitors are entitled to a share. Outstanding hunters enjoy prestige and are widely reputed.

Fish is plentiful in the rivers and their tributaries. Angling, cast-net fishing and trapping are frequent. Most people fish on average once a week (Mannes 2001). Still, fish is considered as merely a poor substitute for bearded pig. Though the forest contains countless edible plants, the Punan avoid porterage as much as possible. Only forest products that can be eaten on the spot are considered worthwhile picking. As a consequence, the major part of the diet is provided by crops — rice, cassava tubers, cassava leaves, bananas, pineapple, etc. — and by spontaneous species from swiddens and fallows close to the village like fern crosier[7] and *terap*[8].

The forest also provides building materials and raw materials for handicrafts. Borneo ironwood[9] or other hardwoods are used in village houses and swidden shelters for stilts. Barks from many tree species and bamboos are used for floors and walls. Leaves of the *Licuala* palm and of other trees[10] are

...but bearded pig is the Punan's favourite meat

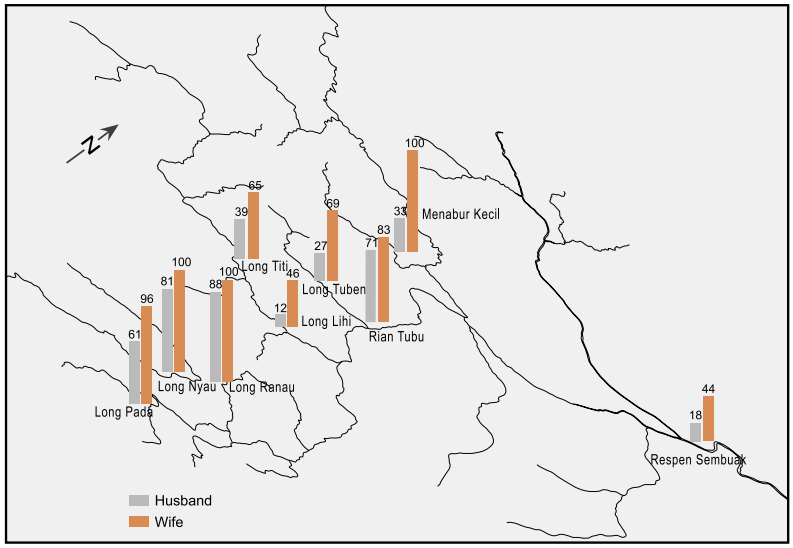
used for roofs and many species of rattan to fix all the parts of the structure together. As most of these components must be replaced frequently[11], people's preference goes to modern houses made of wooden planks with tin roofs fixed by nails. Planks and beams can be produced locally, provided that chainsaws are available. Tin roofs must be bought in Malinau and shipped to Long Pada in the upper Tubu, which doubles the cost. Porterage to Long Nyau or Long Ranau would double the cost once again. This is why only one household in Long Nyau could afford a tin roof.

Countless medicinal products of vegetal or animal origin have been recorded from the area. Information on how to use and prepare them still needs more research, as shamans are rather reluctant to give away their secrets. Shamans generally treat specific diseases, such as possession by spirits and mental disorders, but also fractures (Boedhihartono 2000). More common diseases like malaria, influenza and diarrhoea are considered as originating from downstream and as such must be treated by downstream medicine. Punan hunter-gatherers are large consumers of aspirin and paracetamol. Fever is still the main cause of child mortality and in the upper Tubu, in Long Pada, for instance, 46 children out of 100 die before the age of five.

The forest plays an important safety net role. Only one household out of three enjoys sufficient rice production to cover the family's annual needs. All others depend exclusively on cassava tubers once the rice is exhausted. One to two months before the next upland rice harvest, most families experience a food shortage. This is the period of the *mufut*, when all families leave the villages for a whole month or more (Kaskija 2000). Reviving ancient traditions, small bands of five to ten families live under tarpaulins and roam the forest looking for sago[12], game, vegetables and fruit.

There is no doubt that in remote areas like those in the upper Tubu, people are still totally dependent on the forest for their livelihood. Sago is still a staple food for the poorest families, at least during part of the year. Living in the upper Tubu has drawbacks and advantages. In the early 1970s, when a move to Respen Sembuak, the resettlement community close to Malinau, was proposed, the three villages of the upper Tubu refused to move. The main reason for their refusal was that they did not want to 'split up with the meat'[13]. It was a free choice but also a no-return choice. By opting for bearded pig, they were unable to participate in the general evolution of the province. Having little access to education and healthcare, today they are probably the most marginalized of all communities of Kalimantan. Figures 6.1 and 6.3 compare mortality and illiteracy rates between Respen Sembuak and the villages in the upper Tubu.

Figure 6.1 Illiteracy rates in the upper Tubu (in percentage)



2. Dependency on forest products for cash income

The forest provides countless products for forest people. However, only very few have a market value. The marketing of Borneo's forest products dates back many centuries. Most coastal towns of Borneo were founded by traders in order to capture the benefits of forest products, especially birds' nests for the Chinese market (Sellato 2000). Through history, many forest products had their hour of glory. Some, like Borneo camphor, *damar* resin, numerous gums and rattans, are no longer traded. Others, such as wild honey and bezoar stones, enjoy good sales but are too rare to make a living from. For the time being in Bulungan, apart from timber, swifts' nests[14] and eaglewood[15] are the only forest products that can provide a regular livelihood to collectors (Katz 1997).

Birds' nests are collected in caves, which are privately owned by the finder or his heirs. Nowadays it is rare but still possible to discover productive caves. In the villages surveyed, a handful of households had managed to find new productive caves. However, most productive caves in Bulungan have been known and managed for centuries. Gaining control over caves was even one of the main triggers for migrations and warfare in former times. In Langap for instance, two extended families subdivided into eight households control two caves producing high-grade birds' nests. Each household earns about Rp. 12 million yearly from this activity.

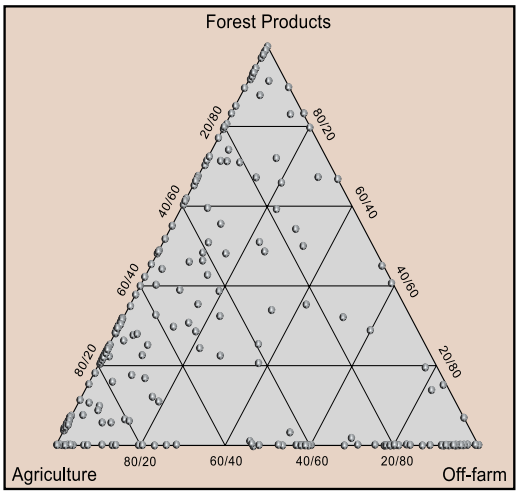
Eaglewood is the only forest product a collector can depend upon in order to make a living. Because of the high demand, the resource is being depleted in most areas. Eaglewood is still available in remote forests in the upper reaches of the rivers. Punan villages try to control access to the resource and ask for collecting fees from outsiders. The latter are generally reluctant to pay the fees and try to avoid coming too close to the Punan settlements.

In the villages of the upper Malinau, Long Uli, Long Metut, Liu Mutai and Long Jalan, nearly all households are totally dependant on eaglewood for their livelihood. Collecting tours are organized all year round, with short pauses only during the slashing of the swidden and upland rice harvesting periods. Gathering activities clearly prevail over agricultural activities. In Long Jalan, for instance, swiddens are rather small, not very well kept, fallow times are short and yields very low. One household out of four did not even bother to open a swidden in 2000. As a consequence, the production of upland rice does not cover the families' needs. In Long Jalan, collecting sago for food is tantamount to a loss of face. People prefer to buy their rice. This is a deliberate choice, as they consider it easier to buy rice with the money from eaglewood gathering rather than producing their staple food themselves. Thus, most households depend on eaglewood collection to secure their cash and subsistence needs (Figure 6.2).

Heads of households and male teenagers generally leave the village for a three-week period to search for eaglewood[16]. Punan collectors are organized in small groups of three to seven people, rarely more. They bring along their dogs, spears and blowpipes for hunting. The group has some basic cooking utensils and a tarpaulin, and each individual takes 10 kg of rice together with salt, cigarettes and medicine. All these items are generally provided on

Eaglewood (gaharu) is the main source of cash for Punan hunter gatherers

Figure 6.2 Bulungan household survey: origin of income



credit by the trader. The latter also provides credit to the families of the collectors remaining in the village. During the collecting, the group moves its camp from time to time depending on the availability of eaglewood. Cooperation amidst the group is restricted to security matters, hunting and cooking. The actual gathering for cash is always an individual activity; the harvest belongs to the finder and is never shared among the group.

After three weeks the group heads back to the village with finds worth Rp. 300 000 to Rp. 600 000 on average. Less experienced gatherers may go home empty-handed, while lucky ones may hit the jackpot. Finds of up to Rp. 30 million or more are recorded at least once a year. Such lucky finds contribute to maintaining the high motivation among the collectors. But on average, once debts are repaid to the trader, it does not take long for the collector to exhaust his pay in basic commodities (rice, sugar, salt, coffee, noodles, cooking oil, cigarettes, alcoholic drinks, medicine and clothes). Even bigger finds are exhausted in a few days on a single trip to the district capital to buy consumption goods such as televisions, generators, VCDs, chainsaws and long-tail engines. After a week's rest in the village, purchased food stocks and cash come to an end. The family quickly reaches its lending limit at the local store and soon the pressure on the collector becomes unbearable. A new expedition to the forest becomes unavoidable.

Eaglewood gathering for cash is not restricted to upstream Punan villages. Other ethnic groups like the Lundayeh, Abai, Merap, Kenyah and even outsiders from Java and Lombok also collect eaglewood. But unlike the Punan, most Dayak groups consider eaglewood collection only as a secondary activity (to agriculture) or an alternative source of income. However, when cocoa and coffee plantations along the Malinau were destroyed by the great floods of February 1999, eaglewood collection regained ground.

In downstream Dayak villages and in resettled Punan villages, eaglewood collecting is limited to one or at most two trips a year during slack periods for agriculture. Collectors are generally young heads of households or young male adults. As the resource is already depleted in nearby forests, they have to forage in forests generally claimed by upstream Punan villages. Collecting parties often consist of 10 to 20 people in order to cope with this increased risk and to avoid paying the fees provided for by customary law. Less experienced than the Punan, these occasional collectors make small finds (on average less than Rp. 300 000 per trip) but they do more damage to the resource[17].

Apart from eaglewood and birds' nests, some other forest products like rattan and game have market potential. The rattan trade came to a complete stop in the area when the commodity price plummeted in the late 1990s. Prices dropped from Rp. 5000/kg wet before the crisis to Rp. 3000/kg after the crisis in current rupiah (or to one seventh of its value in real terms). Pak Abu Bakar, the last trader to attempt to buy rattan, went bankrupt. However, locally rattan is still the basic material for wickerwork. Rattan baskets (*anjat*) and mats (*tikar*) are essential utensils for everyday life. They also play an important cultural role, as they form part of the goods exchanged between families (*sulang*) for a marriage (César 2001). Punan women are renowned for their ability in wickerwork and the recent influx of outsiders (concessionaires, scientists and tourists) provided a new market for handicrafts. In villages close to markets handicrafts play an important economic role, as it is generally the only opportunity for women to raise cash.

Game, in particular venison, can easily be sold on the Malinau market. However, a strong Bugis connection prevents Punan hunters from selling game on the market, arguing that the animals were not killed in a *halal* way[18] (Kurniawan 2001). If not brought to the market alive, the meat has to be sold off at

discount prices. Some informants contend that the buyer often later resells the meat at *halal* prices. Lately, direct selling of bearded pig to Chinese traders or to Respen Sembuak dwellers has been recorded.

3. Dependency on markets

Most forest products are only used for subsistence because they cannot be sold. This does not imply that there is no market for those products, but rather that there is little demand for these products on the local market or that potential markets are not accessible. This lack of accessibility can be physical (distance, absence of roads and means of transportation), financial (cost of extraction, shipping, selling price), socio-economic (limited demand, trading barriers, taxation, trade restrictions) or cultural (inappropriate product not appreciated by consumers) and more often a combination of all these factors.

However, such conditions are not immutable. Timber, for instance, is an invaluable forest product, with very little value in the upper Tubu as long as no road allows its exploitation. This is very likely to change in the near future. Agricultural products like coffee or fruits produced in the upper reaches of the watersheds cannot be sold to Malinau as long as transportation costs exceed average selling prices. Again, this is likely to change in the future with the opening of new roads and the increase in demand due to the development of the district's capital. The inland fishery sector in Malinau is a perfect illustration of what may happen with other forest products in response to increased local demand.

In the upper Malinau watershed, local people mainly catch fish for subsistence needs. The resource is very abundant in villages like Metut and Paya Seturan, and present market limitations prevent fish from becoming an alternative source of income for the local population. The only market centre of Malinau town is located more than two days by boat from Metut.

Closer to the town of Malinau, the high urban demand for fish and shrimp provides local people with an attractive alternative source of income. Shrimp fishing has become the favourite activity of many households[19] because of the relatively high prices for local freshwater shrimp (Rp. 22 000 to 25 000/kg). Two techniques are widely used: nets and electric gear. The use of electric gear, though illegal, is tolerated as long as the more 'modern' fishermen do not penetrate the territories of the more 'traditional' ones. According to the techniques used and to the available fishing days, a shrimp fisher can earn on average as much as Rp. 900 000–Rp. 3 000 000 per month. The specialization level is high as 66% to 78% of the total family income is attributable to shrimp fishing (Mannes 2001).

As far upstream as Paya Seturan, river water quality suffers from the negative impacts of logging and mining concessions. Apart from the heavy pollution caused by logging activities and the spillage of mining residues, concession workers are blamed for their intensive use of pesticides and electric gear for commercial fishing. River pollution by concessionaires, overexploitation of river resources and use of unsustainable fishing techniques has triggered many conflicts about water and aquatic resources. Local people claim high compensation from concessionaires and fight each other for control of aquatic resources. The rapid emergence of an urban market in Malinau prompted the use of unsustainable fishing techniques and a strong decrease in the availability of the resource. Moreover, ethnic divides further aggravate already harsh conflicts over the resource.

Such excesses are likely to happen with many other forest products as soon as roads open up the remotest forest areas of the district. However, it would be a mistake to lay the blame on outsiders alone. In the first phase, outsiders are generally better-equipped to take the lead in the business. They have better access to the developing market and generally master more efficient, 'modern' techniques like dynamite, electric or pesticide fishing, night hunting with four-wheel drive cars and shotguns, logging with chainsaws, etc. In the second phase, local people quickly adopt the new techniques[20] and extend them to larger areas. Chainsaws, shotguns and pesticides are items already familiar to local people. For the last 20 years, chainsaws have been the inevitable souvenir for migrants to bring back from Malaysia. Chainsaws even became the usual gift to be included in bride prices.

One starts to wonder if sustainable techniques are reserved for subsistence goods only. As soon as marketing opportunities appear, outsiders as well as local people make a rush on the resource and try to get the most out of it as quickly as possible.

Sustainable ways of exploiting forest products for cash have yet to be found.

4. Dependency on traders rather than on markets

In the upper Malinau, the Punan are as dependent on forest products as in the upper Tubu. However, while the latter depend on forest products for their subsistence needs, the former depend on eaglewood for their cash income, which in turn they use to buy their food. This difference is neither linked to resource abundance nor to cultural preferences but to the level of trading activities. In the upper Tubu although the resource is far from being depleted only very few traders dare to risk their boats on a four-day journey across dangerous rapids. The upper Malinau is easier to reach and four traders[21] compete on a regular basis for the resource.

Trading in forest products is a textbook case of a patron-client relationship. According to a well-off trader, there are three main keys to success in forest product marketing: (1) prompting people to collect, (2) securing the collectors' loyalty and (3) getting the best out of the transaction (Kurniawan 2001).

In order to incite people to collect products in the forest for three weeks in uncomfortable and unhealthy conditions[22] , indebtedness to the trader is the preferred option. Keeping people indebted is good leverage to foster the collecting spirit and to ensure loyalty. As the first step, traders take advantage of the hunter-gatherers' consumerist tendencies. They supply them both with basic necessities and expensive manufactured goods on a credit basis. Quite often, traders make bigger benefits on the manufactured goods they sell than on the eaglewood they buy. The traditional bride price the groom has to pay to his in-laws also serves the traders' objectives. In former times, exchanges were limited to prestigious goods like Chinese jars and gongs, which could be kept from generation to generation. Nowadays, the most sought-after goods, such as long-tail engines and chainsaws, are not only expensive but also need frequent replacement (César 2001).

Once hooked, the client has no other choice but to collect forest products for his patron. In order to finance a two to three-week collecting tour to the forest, the collector usually takes another loan[23] of Rp. 100 000–300 000 from the trader. Later, this loan is deducted from the amount paid to the collector. Quite often the value of the eaglewood sold is insufficient to cover the credit and debts accrue. Most collectors are trapped in debt and are thus obliged to sell their forest products to a specific trader. Such a rule also applies to traders. Those who work with their own capital are free to sell their eaglewood to any wholesaler. Traders working with capital borrowed from a *toke* (wholesaler) are of course obliged to sell their produce to that *toke* (Kurniawan 2001).

Every trader has strong ties with his collectors or *anak buah* and takes all necessary steps to avoid competition with other traders. Securing the loyalty of one's *anak buah* is an absolute necessity. Debt is not always sufficient. To prevent the collector from selling his product to the first trader he comes across, the most efficient way is to make sure to be that trader. Thus, after organizing a collecting tour, traders often stay in the villages and wait for their *anak buah* to return. Adopting local customs and being able to speak the local language are also essential to secure loyalty (Kurniawan 2001).

Most eaglewood traders are outsiders. Very few traders are Punan and they only work on a very small scale (four to five *anak buah*). One trader, Haji Mahfud, controls, directly or indirectly, about 70% of the eaglewood traders of the Malinau watershed. Most traders have family links with him and borrow funds from him. Confidence and trust clearly depend on family links and/or on ethnicity. Thus, there is a strong tendency for traders to marry indigenous women in order to strengthen the relationship with their *anak buah*.

Getting the best out of the transaction is secured by strong dependency ties, by the opaqueness of the market, and by certain level of deception. Being considerably in debt to the trader, the collectors' bargaining power is limited. They generally have to accept the grade and the price decided by the trader. Traders, however, must be careful, because if they go too far they will lose their *anak buah*'s confidence and loyalty. Collectors might well sell their harvest to better-paying traders and never repay their debts.

In marked contrast to agricultural or timber products, the market information regarding demand, supply and price trends for NTFPs is very poor. The problem of non-availability of basic information on actual production, local consumption, and the surplus available for domestic and international trade is very

acute. At national level, except for a handful of very important forest products like rattan, bamboo, oleoresin, etc., very little knowledge exists and most NTFPs are rarely covered in national statistics. Eaglewood marketing is typical in that it suffers from a total lack of transparency. The traders are the collectors' only source of information. From our enquiries, no gatherer had the slightest idea on the use, the users or the final destination of the product he was collecting, not to mention the price levels reached at the other end of the trading chain. The local traders' knowledge was also limited to the wholesalers' level.

Eaglewood purchasing is allegedly based on quality. The quality depends on contents in the resin, its form and general appearance. High quality eaglewood is black and sticky. Thus, colour is the main criteria of quality. The darker the wood, the higher the price. Eaglewood quality appraisal is very subjective, with buyers and sellers using different colour charts. Of course, every trader tends to downgrade the quality of the eaglewood he purchases. Prices also vary greatly from one trader to another whatever the quality. Traders generally tend to pay higher prices for small quantities of higher-grade eaglewood, and to pay less for larger amounts of lower-grade eaglewood. Needless to say, collectors are usually on the losing side.

However, in patron-client relationships deception is always limited to acceptable levels. Exaggeration would cause the breaking of the tie, throw the collector into another trader's arms, or prompt him to renounce collecting and/or disappear in the forest.

The total lack of transparency of the market and the absence of recognized standards of quality at local and national level are the main causes of the failure of the marketing chain. As a consequence, the nominal value of eaglewood is not based on an interaction between supply and demand, and no fair market mechanisms are available.

5. Dependency on forests for swidden cultivation

The former differentiation between Punan hunter-gatherers and Dayak swidden cultivators no longer applies in Bulungan. Nowadays, all communities — with only few exceptions — have adopted rice as their staple food and practice upland rice cultivation. In recent years, some communities have even expressed an increasing interest in lowland rice cultivation.

The adoption of swidden cultivation by the Punan is concomitant to the settling in villages and to the changing of staple from sago to rice. For some Punan groups this change occurred two to three generations ago, whereas for others it is contemporary. Nevertheless, there are great differences between Dayak and Punan methods of managing a swidden. Though techniques are rather similar, this difference expresses itself in the size of the swiddens, in the number of varieties of upland rice seeds, the amount of labour used and the yields of the crop.

Swidden upland rice cultivation is perfectly suited to the specific conditions of the physical and economic environment of Borneo: very low chemical soil fertility, abundance of land and scarcity of labour. The determining factors of this farming system are the burning of the slashed biomass and the bush fallow period between two slashings. Because of rapid mineralization and heavy leaching, the very old soils of Borneo — from a geological point of view — are very poor in nutrients. In the absence of fertilizers, the slashing and the burning of the abundant biomass provides a considerable amount of nutrient in the form of ashes for the crop. A swidden that cannot be burnt is never seeded, as the crop would not be fertile. A swidden is only cultivated for one to two consecutive years, seldom more. This is because, firstly, the ashes are quickly removed[24] and the nutrients leached by the heavy rains. Secondly, once the forest is cleared, grassy weeds tend to overrun the swidden, and after two years yields drop by half if the farmer does not resort to weeding. But weeding is tedious and labour-intensive. Where land is plentiful and labour expensive, it is economically more profitable to open a new swidden than to resort to weeding. The old swidden is not abandoned but left fallow. The luxuriant forest regrowth will help the farmer to get rid of the grassy weeds by shading out without applying any labour. After 10 to 15 years or more, the regrowth turns into a secondary forest free of grassy weeds and the plot is ready to be slashed and burnt again. Short fallows of five years produce enough biomass to fertilize the swidden. However, it takes 10 to 15 years to substantially reduce the stock of grassy weeds. After 20 years of bush fallow the effect of the shading out is similar to that of a primary forest (Levang *et al.* 1997).

The system has many advantages. If practiced properly, it is ecologically sound and sustainable, it requires little labour and provides high returns per man-day. Its main drawback is that it is rather land consuming. A holding of 15 to 20 ha per family is necessary to ensure the system's sustainability. Otherwise, the length of the fallow period has to be reduced, the soil fertility level decreases, the swidden is overrun with weeds, risk of fire increases and regular burning may turn the swidden into *Imperata* grassland.

Another drawback of the system is that it provides rather small yields — compared to lowland rice — and that there is little room for yield improvement without resorting to inputs and applying more labour. On the contrary, there still is room to improve the system's already high return to labour. The introduction of chainsaws, for instance, has a tremendous impact as it reduces labour requirements for felling from 25–30 man-days to three man-days per ha. In other parts of East Kalimantan like Pasir, where land is becoming scarce, herbicides have rapidly gained popularity among swidden cultivators. Herbicides enable the shortening of the bush fallow period without resorting to manual weeding. However, in Bulungan land is still plentiful and the use of herbicides is limited to areas close to Malinau and to outsiders.

In fact, the area under swidden cultivation increased considerably in the district of Malinau during the last decade. Traditionally, swidden cultivation is restricted to areas close to the village or easily accessible by boat. As the harvest must be brought back to the village, a walking distance of two hours is generally the upper limit for opening a swidden. The limit can be extended as long as the harvest can be shipped to the village. The situation totally changed with the building of the road network from Malinau to Loreh and beyond. Thanks to the road, villagers could expand their swidden area as far as 30 km from Loreh. The transportation provided by concessionaires, not the road itself, is the determining factor. Hitch hiking from the village to the swidden and back is commonly practiced. At harvest time, farmers tip the lorry drivers to haul the rice back to the village. Recently, as part of a compensation deal for environmental damage, Loreh villagers obtained transportation facilities from mining company BDMS. Now, every morning, company trucks take commuters from Loreh to their swidden and pick them up again in the evening (Buyse 2001).[25]

Dayak swidden cultivators commuting from Long Loreh to their ladangs (farms)

In villages close to concessionaire camps, some farmers — mostly women — specialized successfully in producing vegetables for the market (Sitorus 2001). However, such opportunities are rare and more often swiddens only provide part of the household's needs in rice and in vegetables. Very few farmers are in a position to sell part of their production. The complement is bought on the market with cash obtained from non-agricultural activities like forest product gathering, part-time work for concessionaires, 'illegal' logging and other off-farm activities.

Though rather high when compared to Java for instance, returns to the person-day in the agricultural sector are lower than wages from other opportunities. Thus, heads of households often give priority to off-farm activities. Farming is at least partly restricted to providing food security for the family. The recent development of lowland rice cultivation in Bulungan is partly linked to this preference for cash-earning jobs. Though requiring rather small amounts of labour, swidden cultivation necessitates the presence of the head of household at least for the slashing and generally also for the seeding and the harvesting. In the case of lowland rice cultivation, as ploughing is not practiced locally, all the work — slashing weeds, transplanting rice seedlings, weeding and harvesting — can be done by women, thus totally freeing the men from agricultural activities[26]. Such evolution is already commonplace in Langap, Pulau Sapi and Respen Sembuak (Issoufaly 2000). But in the two latter villages, the development of lowland rice cultivation is also due to restricted access to swidden cultivation areas, which is usual in resettlement villages.

6. Dependency on concessionaires

Concessionaires such as logging companies or coal mining companies, non-governmental organizations (WWF) and research institutes (CIFOR) draw mixed reactions from local people. In a first approximation, they do not really differentiate between all these outsiders. The general perception is that if a wealthy outsider, living in a comfortable environment and benefiting from the best of development is willing to come to forest, it can only be in order to become richer. At the very least, there must be a trade-off. Thus, local people consider that they are rightfully entitled to tap part of this wealth (Sitorus 2001; Kaskija 2000).

Concessionaires, for their part, consider that they have paid for the right to extract logs or coal, and the government should not ask them to carry out local development in place of the local authorities. Until recently, a good relationship with local people was not really considered an essential asset for concessionaires. Everything changed with the *reformasi* era when it became obvious that bad relationships could end up in costly conflict.

Since then, concessionaires have been eager to demonstrate that they have a considerable impact on local people's wellbeing. They claim they have a significant direct impact on local people by offering employment opportunities, through the PMDH programme (see below), the opening of new roads and the payment of compensation for the loss of agricultural land. But their indirect impact is probably more important, through the opening of new areas for shifting cultivation, through increased marketing opportunities for local forest and agricultural products and through providing secondary employment opportunities. However, concession workers may also compete with locals for forest resources and thus foster new conflicts. Last but not least, by disrupting the traditional way of life of local communities the concessionaires often have a strong negative social impact.

Results from our research showed that direct employment opportunities with concessionaires are still very limited for local people. Though about 80% of the positions could be held by locals, data from companies[27] show that on average only 50% of the jobs are given to locally hired people. In fact, this figure includes quite a lot of outsiders who applied locally for the jobs. Limited skills and low reliability are often the main reasons why concessionaires avoid hiring local people. Local people, for their part, cite ethnic preferences and family connections to explain the discrimination (Sitorus 2001).

The PMDH programme[28] is a government initiative trying to involve concessionaires in local development projects for the benefit of local communities. INHUTANI I and II proposed the development of road infrastructure at village level, and subsidized agricultural development through the distribution of seedlings, pesticides and fertilizers, demonstration plots and agricultural extension. Unfortunately, PMDH programs are generally not very successful. Failure is mostly due to the lack of commitment on the part of the concessionaire's

personnel, the lack of involvement of local people in the process, and limited human resources and funds. Some programmes, however, had greater impact, such as the donation of a truck to a village cooperative for transportation between Loreh and Malinau.

Compensation obtained from concessionaires for the loss of agricultural land has had a tremendous economic impact on local people. Compensation in hard cash is the most popular but many concessionaires prefer to settle for compensation in kind which benefits the whole community: roads, housing, community buildings, and water supplies. Recently the main criterion of the choice to open new agricultural land has been the possibility of obtaining compensation from concessionaires.

Indirectly, the proximity of a concessionaire's activities has a determining impact on the village economy. The access to a new road network opens up new marketing opportunities, especially for timber. The economic centre of the villages often moves from the riverbanks to the roadside. The new roads open up huge areas for shifting cultivation, some farmers opening swiddens and creating plantations as far as 32 km from their village. People from Gong Solok intend to move their village from the Malinau River to the logging road. Some Punan from Long Loreh plan to create a new village along the road between km 49 and km 51. Though they already moved their village three times during the 10 last years, the inhabitants of Langap want to reconstruct their village on the other side of the river in order to benefit from a direct road access to Malinau. The people from Long Loreh obtained transportation facilities from BDMS. Every morning and evening tens of farmers wait on the roadside as commuters to be transported to and from their swidden. Concessionaires' camps are also popular spots for marketing forest and agricultural products like vegetables, fruits, game, goats, fish, birds, and handicraft products. These new marketing opportunities have helped to increase the price of agricultural products by 20% to 40%. These commodities are now the main source of income for local people.

Numerous indirect job opportunities are also linked to the presence of the concessionaires. In villages close to camps the influx of workers had a tremendous impact on the development of shops, restaurants, houses or room rentals, jobs as cooks and washerwomen and so on. The price of land in the village of Loreh increased by 400% and a small room can be rented for Rp. 30 000 to 60 000 per month.

The social impact of concessionaires has also been tremendous. By increasing economic opportunities and by opening remote villages to the market, concessionaires considerably disrupted the traditional social order. Family ties get looser and self-help is no longer popular. Everybody is looking for big and easy money. Greed is generally at the source of new conflicts with the concessionaires but also with other villages and among villagers. There is no doubt that the indirect impact of concessionaires has been much more important than their direct impact. However, concessionaires are not to be held responsible individually. The disruption of the traditional society would probably have happened anyway[29]. The concessionaires only accelerate the process by creating a conducive environment.

In a bid to improve relationships with local people, INHUTANI II considered the possibility of helping local people to exploit the waste wood from timber extraction. Our research showed that a quite considerable amount of wood usually left to rot could be reclaimed this way. However, such an operation would need considerable involvement from the logging company in matters of organization, transportation and maintenance, not to mention the legal aspect of the problem (Gumartini 2001). But the main drawback, for the time being, is the rapid development of IPPKs[30]. With the latter, villagers are offered royalties by 'investors' for the logging of so-called traditional forests. Local people no longer see why they should be content with waste wood when they can enjoy the benefits from all the timber. All over the district of Malinau, the craze for IPPKs is pushing villagers into deals with investors (Obidzinski *et al*. 2000). Huge advance payments to village heads are later deducted from royalties, and promises of conversion into plantations are generally fallacious. The lure of easy money is the main driving force. But at present rates of deforestation there will be no forest left in the Malinau district in 12 years' time.

Recently there has been an escalation in the number of claims for compensation from companies. Resorting to demonstrations and roadblocks to extort money from concessionaires has become commonplace, even for the most trivial reason[31].

People learn fast. Following Jakarta's example, some wealthier groups recently created new job opportunities hiring demonstrators by the dozen to put pressure on companies. Though many of these claims are legitimate, there is an increasing tendency to seek easy money from outsiders or from the government rather than to involve oneself in economic activities. In line with this, it seems that the forest is no longer considered as essential for making a living but rather as a source of easy money.

7. Dependency on outside goods and services

In former times, forest people bartered forest products mainly for salt, tobacco, loincloths and iron blades. Chinese jars and gongs, and to a lesser extent beads and betel chewing kits were the most sought-after prestige goods. Jars were used daily as containers but also as funeral urns. Jars served as units of value, and a family's reputation could be measured by the number of jars owned[32]. They were the most important item of the bride price (César 2001).

In the context of active headhunting, the survival of a small group depended on its ability to secure strong ties with other bands. Such ties were mostly based on matrimonial links and materialized by the exchange of prestigious goods like jars, gongs, blowpipes, etc. There is no doubt that the main trigger for bartering forest products[33] was the necessity of obtaining these luxury goods from the outside world. In stratified ethnic groups, the ownership of 50 jars was commonplace for an aristocratic[34] family. As exchanges were taking place among small numbers of families and over generations, wealthy families were able to accumulate prestige goods over time.

Nowadays, such accumulation is no longer possible for various reasons. First, the spectrum of prestige goods has increased considerably. Chinese jars are still sought after but have lost popularity in favour of modern manufactured goods like long-tail engines, chainsaws, motorcycles and electronic goods. These modern goods are not only costly, they are also easily damaged and need maintenance or quick replacement[35]. Second, the bride price has increased considerably. Nowadays, the bride price asked for a Punan girl from Respen is totally out of reach for a young man living in the upper Tubu. In the Putuk ethnic group, the bride price has become so excessive that many young men look for wives from other ethnic groups. Thus, prestige goods are lost to other groups and not replaced. This last trend worries many customary leaders who try desperately to fix the bride price to acceptable levels and to fine families who do not respect the ancient rules on the exchange of goods. However, they are unlikely to succeed as the traditional exchange of goods has already turned into a monetary transaction that no longer serves to strengthen links among the groups.

Last but not least, local people developed over time strong ambitions for their families and children. Their desire for educational and health services has rarely been met by government projects, especially in remote locations. Local people's frustration at the government for not providing adequate educational and health services has made communities willing to take matters in their own hands and strike deals with logging companies and plantation developers for these services. Aspirations for health care and formal education developed an increased dependency on cash earning activities. Considerable amounts of cash are necessary to pay for transportation, tuition and boarding fees, especially for higher education, as no infrastructure is locally available. Village dispensaries are seldom well-equipped, and if necessary people do not hesitate to go to Malinau or Tarakan for medical care[36].

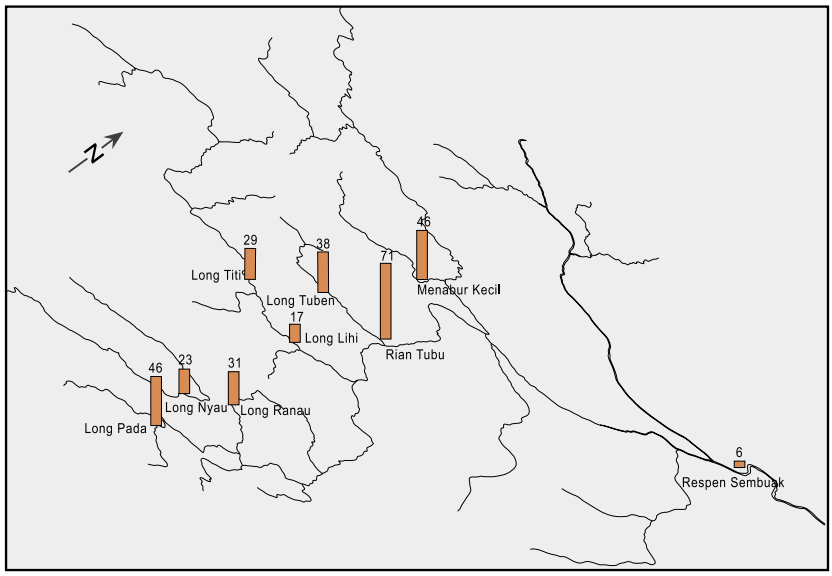
For all these reasons, forest people are increasingly dependent on cash. And, for the time being, the forest — for its timber and non-timber forest products, concessionaires and 'investors' — is the only potential provider of cash. As long as no alternative source of cash is made available to local people, the pressure on the forest is unlikely to be relaxed.

8. An overall dependency on accessibility

The comparison of the difference between upstream and downstream villages, between well- and badly-served villages leaves no doubt: accessibility is the main determining factor. Low accessibility has some advantages and many drawbacks. Be they Dayak or Punan, all agree that the main advantage of living in a remote settlement surrounded by primary forest is that 'meat is easy'. And by 'meat' people generally mean 'wild boar'. Bearded pig is always ranked higher than any other forest product, even cash-earning ones. Living closer to eaglewood-rich forests only reduces the length of a collecting tour from three to two weeks. Of little concern to eaglewood

collectors, this one-week difference is paramount for hunters[37]. Low accessibility is synonymous with preserved forest. But it also means high transportation costs and reduced competition among traders, low access to markets, and thus low prices for forest products and agricultural commodities, and high prices for manufactured goods. Bad communications with the outside world do not encourage teachers or paramedics to stay in the village. Being unable to access formal education further marginalizes upstream communities, while they pay a heavy toll in the absence of health care[38] see Figure 6.3).

Figure 6.3 Mortality rates in the upper Tubu (number of deaths per 100 births)



Punan family from the upper Tubu. Infant mortality is still very high

Good accessibility has many advantages but also some drawbacks. The opening of the road — and its good maintenance by concessionaires — between Malinau and Loreh had a tremendous impact on economic exchanges. Transportation time between the two localities dropped from one day by boat to three hours by car. The cost of outside goods was consequently reduced and new market opportunities were opened for local people, especially due to the influx of concession workers. Thanks to the new opportunities Loreh has been developing quickly: electricity, water supplies, a small hospital, television and VCDs are all now available. Such rapid development is not without its drawbacks. The intense activity of concessionaires leads to increased environmental damage, deforestation, air and water pollution, and disruption of traditional village life. Mutual aid among villagers gives way to individual enrichment. Competition for natural resources leads to conflicts with outsiders and among villagers, economic differentiation leads to *nouveau riche* behaviour and to jealousy, not to mention social pathologies such as alcoholism, gambling, and prostitution.

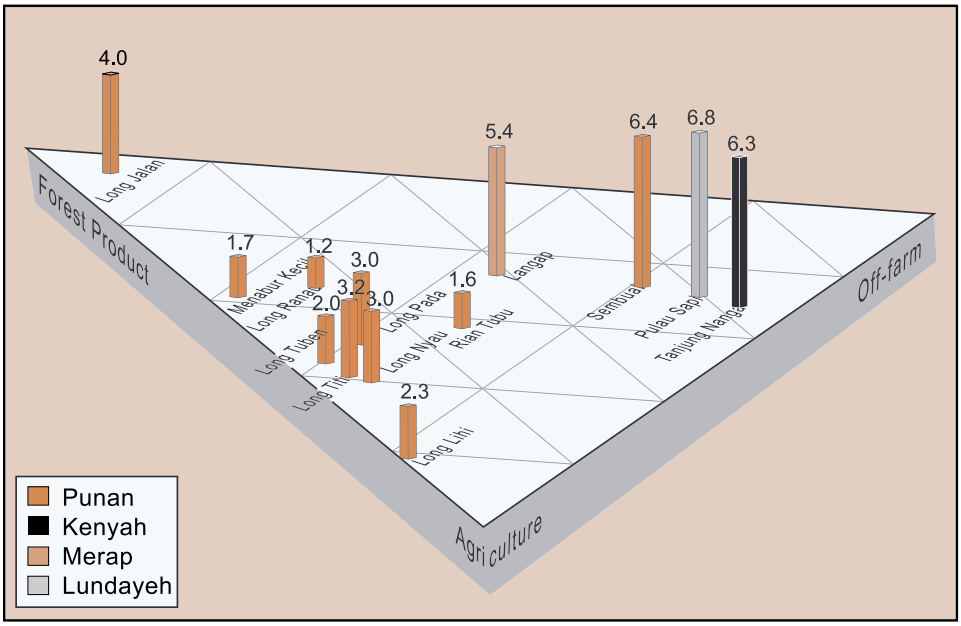
But for local people there is no hesitation: 'let's benefit from the advantages first, we'll deal with the drawbacks later'. And in the upper reaches of the rivers, where the countless rapids prevent the floating of the logs, there is no other choice than building roads to cash in on the royalties from IPPKs.

9. A general trend: securing cash income

By comparing villages in different locations and at different stages of development, a general trend comes to light (Figure 6.4). This trend goes from forest product gathering to agricultural activities and to salaried activities. Even in remote areas, forest people are no longer dependent on forest products for their staple food. Sago only plays a role as a safety net in case upland rice and cassava harvests are insufficient to meet the family's needs. In places where rice can be bought, sago is no longer part of the diet, as people prefer to buy their rice with the income provided by eaglewood collection. Nowadays dependence on sago as a staple is restricted to *mufut* periods.

Further downstream, where eaglewood is no longer available (or in the absence of traders), people

Figure 6.4 Average household income (million rupiah per year)



make a living from agricultural activities. There, swidden cultivation becomes essential, some people try their luck with plantation crops like coffee or cocoa, and forest products collection becomes a secondary activity during slack periods. Temporary work for concessionaires or 'illegal' logging is also considered an attractive option.

Even further downstream or in places close to concessionaires where salaried activities are available, swidden rice or lowland rice cultivation becomes secondary and is mostly entrusted to women. The men work for the concessionaires in the area and sometimes migrate temporarily as far as Sabah and Sarawak. In big villages like Pulau Sapi or in Malinau, many households benefit from regular wages and sometimes no longer practice agriculture.

This general trend goes along with the search for greater security and regularity in cash income and a more settled way of life. Pure foragers do not exist anymore but seasonal mobility is still high in remote Punan villages. For the Punan, settling down in a village implies adopting swidden cultivation. In the upper reaches of the rivers, where population density is low and eaglewood still available, most households specialize in forest product gathering. Eaglewood collecting provides a fairly regular source of income but what attracts collectors is the hope of hitting the jackpot — one lucky find and all your dreams come true.

In the middle reaches of the rivers, where people mostly depend on agricultural activities, securing cash income becomes problematic. Swiddens provide part of the household's staple food needs but not cash. Plantations such as coffee or cocoa are managed too extensively to provide regular incomes. At the present technological level — i.e. no fertilizing, infrequent weeding and no pest management — these plantations are unlikely to play an economic role either at the household or at the regional level. Promoting higher-level technology is unlikely to succeed, as it would imply higher costs in terms of inputs and higher labour requirements, which in turn would imply more financial risks for the farmer and lower returns per person-day. For the time being, agricultural activities cannot compete with the more lucrative opportunities offered by concessionaires and 'investors'.

Wage earning is the dearest wish of most heads of households, if not for them, then at least for their children. However, securing regular cash income also has numerous drawbacks. Local people still find it difficult to abide by the rules of salaried work: fixed working hours, targets, and restrictions on leave and so on. Positions as civil servants are still the most sought-after as they provide low wages but the highest degree of flexibility. They also provide pensions.

However, salaried jobs are set aside for skilled and educated personnel. Thus, local people are seldom successful when they apply for well-paid jobs at concessionaires. Know-how and education are required but are not in themselves sufficient, as family ties and ethnic relationships generally prevail over other qualities of the applicant. The local administration is clearly in the hands of the most prominent ethnic groups. A young graduate from a marginalized group has little chance of being considered. For the most enterprising, migrating to Malaysia was the easiest way to get a well-paid job until the outbreak of the Asian crisis. Nowadays the situation is more problematic for immigrants but the Malaysian option still has its advocates.

But today, for all groups, from Malinau to the upper reaches of the rivers, from the most prominent to the most marginalized, the best option of getting huge amounts of cash is to strike a deal with an 'investor' to sell one's forest to loggers[39].

10. The forest's last stand

Has local people's dependency on forest products been overstated? Certainly not from a cultural point of view. Interethnic relations, social organization, way of thinking, sense of wellbeing, and system of values still totally depend on the forest. But from an economic and materialistic point of view this dependency has decreased considerably over time. Formerly, to nomadic bands of Punan hunter-gatherers, sago and game was paramount to their subsistence. To settled Dayak swidden cultivators, the maintenance of the forest ecosystem was essential to the sustainability of the farming system. Bartering forest products, for prestige goods and salt, tobacco, loincloth and iron blades, was essential to the survival of both groups. But if one takes a close look at recent developments in the area, it is clear that the dependency on forests and forest products is not absolute but relative. Dependency on forest products is seldom the result of free choice; it is merely the sole option available. As we saw, forest people do not collect forest products

on their own initiative. Traders decide which product they want to buy; they organize the collection and control the marketing chain. As soon as new options are made available, i.e. labouring for concessionaires, wage working, migration to Malaysia, etc., the dependency on forest products is reduced. People analyse the options at hand in a rational manner, from economic, social and cultural viewpoints. They weigh the pros and cons of regular and secure earnings, of higher but riskier earnings, of short-term versus long-term employment, of local versus distant job opportunities, etc.

Nowadays, available opportunities are no longer restricted to forest product gathering. However, not all forest people are guaranteed equal rights to access these new opportunities. First, most forest people lack the know-how and level of formal education required for the most sought-after positions with concessionaires, the civil service and other private companies. Second, strong networks based on family and ethnic group links bar outsiders' access to better positions. Local people regularly complain about the preference given by concessionaires to Javanese, Bugis, Batak and other groups from outside Borneo. But the same rule applies in the local civil service, where Tidung, Kenyah and Lundayeh take the best at the expense of other ethnic groups. The Punan are by far the most marginalized for the reasons given above. Their exceptional knowledge of the forest confines them to the role of hunter-gatherers. But this is no longer a deliberate choice, especially among young Punan graduates, who experience a growing feeling of frustration.

This feeling is not restricted to Punan but also to other ethnic groups. Parents often make big sacrifices to ensure a proper education for their children, and both parents and children resent the absence of adequate job opportunities. Again, resentment is generally directed against outsiders to Borneo, which fuels the potential for ethnic conflicts.

Clearly, not everybody will be able to take advantage of ongoing changes. However, with the implementation of regional autonomy, some ethnic groups, and more precisely the leading classes[40] of these groups, will probably be able to compete with outsiders. But the poorer classes and the marginalized communities will likely remain dependent on forest product gathering to make ends meet. But for how long will they be able to rely on the forest? Eaglewood is already depleted and no other NTFP is likely to take over its role. *Damar* resin and rattan are plentiful in the forest but traders are not interested. Plantation crops like coffee, cocoa or oil palm? For the time being, the returns from agriculture cannot compete with other opportunities at hand. Forestry plantations? Planted forests might be the best option for the future but not while large stands of primary forest are available in the vicinity.

Forest people from the Malinau district cannot be labelled as poor. With little exception, all still have access to relatively good sources of cash and no one ever experienced starvation[41]. Poverty in Malinau is not linked to income but to lack of access to education and health facilities. In the upper reaches of the Malinau and Tubu rivers, there are no schools and sanitary conditions are appalling. Most people are illiterate and children pay the heaviest toll. In order to alleviate poverty in these remote areas, the government decided some 30 years ago to resettle villages in areas closer to the district capital. Over time, the resettlement proved a success, at least in matters of access to education and to healthcare. Recently, as resettlement is no longer considered a viable option, the district government decided to build roads linking the remotest villages to the district capital. This much-awaited move gained the support of most local people but frightened conservationists.

The latter have every reason to be worried. Once opened up, the rich primary forests of the upper Tubu and Malinau will fall victim to the loggers' greed. Most communities of the Tubu have already contacted 'investors' in order to attract them to their village. None of these so-called 'investors' is ready to invest in road building, but as soon as the area is opened up, no doubt they will flock in in great numbers. Local communities seem little concerned about forest conservation and are not afraid of deforestation. In fact, there is little awareness of the consequences of deforestation. These communities have always lived in or close to the forest. They believe — or want to believe — that the loggers will just remove a few logs without destroying the forest, or that they will convert the forest into productive plantations. It is hard to say to what extent they are fooled by 'investors' or they fool themselves.

It is difficult to hold it against them. Local communities are in dire need of hard cash and, for the time being, the forest represents the 'best' — if

Small Punan settlement in the upper Tubu. None of these children were able to attend school

not the only — way to obtain a large amount of cash quickly with a minimal input of labour. No other opportunity can compete with it. And as long as this opportunity is open, no other development will be conceivable.

Up to now, there has been no real conflict over the use of the resource between shareholders or even among the communities. The local government receives taxes and local communities receive royalties, while 'investors' strike more profitable deals than ever[42]. There is a clear consensus on the use of the forest; any conflict is only about the sharing of the benefits. In that sense communities have become increasingly interested in territorial matters, mapping village areas and fixing and materializing borders. Anteriority of settlement in the area has become a disputed issue, as well as former political dependencies. Affirming the community's legitimate ownership and rights to the resource has become the main concern of community leaders.

For the resettled communities of the Tubu watershed, such concern has unprecedented implications. To the nomadic Punan hunter-gatherers, living in a village is something rather recent and the concept of village territory traditionally unknown. The forest resources of the Tubu watershed are open access to all Punan Tubu. The rate of intermarriage is very high between all villages and only former swiddens or orchards or birds' nests caves are clearly appropriated. The forest is not. Thus, it is difficult to secure one's ownership over former village territories without being physically present. As a consequence, most village leaders in Respen are considering moving back to their former village to reinforce their claims and to avoid conflicting claims over their land (Kaskija 2000). At the same time, families from upstream settlements who planned to move downstream are reconsidering their decision.

For the time being, everybody's hopes are pinned on the forest. Not as a sustainable source of forest products, not as a support for an ancient way of life, but as a principal source of hard cash. The risk is great that the first IPPK will be followed by many others. If nothing is done to counter the present trends, in a short while, one of the last stands of lowland dipterocarp forest of Borneo will end up as sawn timber, plywood, pulp and paper. The risk of seeing forestland converted into wasteland is high. Some people might benefit from the process, and it is easy to imagine who will be on the losing side.

However, it is not all doom and gloom. The local people's commercial orientation and strong aspirations for development are in itself a very valuable resource. The education level is rising quickly, accounts from deforested areas become available and conservation issues are often discussed

among villagers. Many wonder if a future without forest would be a viable option. With the implementation of regional autonomy local people have an opportunity to take matters into their own hands. Dayak and Punan in general, because of their history of trade in forest products, strong migratory history, and decision-making structure that favours a combination of village debate and reliance on key aristocratic elders, has profound implications for how they respond to new economic opportunities. Up to now, these opportunities have generally been seized by local elites. However, more and more people question their leaders' choices and long for a more democratic decision-making process. Reconciling development and conservation objectives in Bulungan is not (only) a technical problem but a rather a matter of good governance. The next chapter will explicitly look at the prospects of communities making their aspirations heard.

Endnotes

[1] In one case, data was obtained on the condition of providing private lessons to the fishmongers' children.

[2] Exchanges of goods, labour, information, knowledge, know-how, etc. and marital exchanges.

[3] In year 2000/2001, only 7% of the households did not open a swidden.

[4] *Sus barbatus,* commonly known as the bearded pig.

[5] During headhunting times the Punan were feared for their ability with blowpipes and skill in preparing poisonous darts.

[6] *Strychnos* sp. and *Antiaris* sp. are commonly used for preparing blowpipe poison. *Dioscorea hispida* and *D. piscatorum* as well as *Derris elliptica* are used for poison fishing.

[7] *Asplenium, Lygodium, Nephrolepis, Diplazium* and *Pteris* spp.

[8] *Artocarpus odoratissimus.*

[9] *Eusideroxylon zwageri.*

[10] *Licuala* spp. leaves are the favourite material for thatching, but other leaves (*Marantaceae* and *Dilleniaceae)* may also be used.

[11] At least every two years for a vegetal roof.

[12] Three species of palm are locally used for sago: *Metroxylon* sp., *Arenga undulatifolia* and *Eugeissona utilis*.

[13] *Tidak mau cerai dengan daging.*

[14] *Sarang lumut* in Indonesian.

[15] *Aquilaria* spp. or gaharu in Indonesian.

[16] Eaglewood or eaglewood is a resin produced by various trees of the *Aquilaria* genus. The resin is produced as a reaction to fungal infection following injuries. The tree is chopped to pieces during the harvesting process, which is why the resource is fast disappearing.

[17] The Punan claim that outsiders being unable to recognize trees containing resin carelessly chop down any *Aquilaria* tree, thus compromising the renewal of the resource.

[18] The city of Malinau is predominantly Muslim, thus animals must be killed according to Islamic rites, and of course pork is prevented from entering the market.

[19] Mostly belonging to the Tidung ethnic group.

[20] They often blame outsiders for using destructive techniques as long as they are not in a position to do the same.

[21] Two traders run shops and have more or less permanent representatives in Long Jalan. Other traders occasionally visit the village and try to divert the local production.

[22] Malaria outbreaks are frequent while camping in the forest.

[23] Called *ongkos*, this credit in kind — rice, salt, tobacco and medicine — covers the collector's and his family's basic needs.

[24] Especially on steep slopes. Yields are always higher on flatland or at the foot of the slopes where ashes concentrate.

[25] In remote areas like in the upper Tubu, there is not a big difference between living on a swidden or in the village. Thus, some families or group of families may choose to live on swiddens even far away from the village. In Long Pada, for instance, some families live at a one-day distance by foot.

[26] Lowland rice cultivation is also commonly practiced by elderly people lacking the manpower to clear swiddens.

[27] Special attention was given to five 'concessionaires': the mining companies BDMS and John Holland, the logging companies INHUTANI I and II and the international research institute CIFOR. The local communities concerned were: Seturan, Langap, Long Loreh, Bilah Bekayuk, Sengayan, Plancau, Gong Solok, Batu Kajang, Tanjung Lapang, Pimping, Terasnawang and Salim Batu.

[28] PMDH stands for *Pembinaan Masyarakat Desa Hutan* (forest community training programme).
[29] The influence of mass media (radio and television) has probably been more determining.
[30] IPPK stands for *Izin Pemungutan dan Pemanfaatan Kayu* and addresses smallscale logging concessions attributed by the Bupati.
[31] In August 2001, three roadblocks were organized between Loreh and Malinau in the same week. Compensation of Rp. 3 million was demanded for a dog run over by a truck. The deal was settled at half this amount.
[32] And by the number of trophies, i.e. heads severed.
[33] Another opportunity was the capture and sale of slaves to the coastal kingdoms (Sellato 2000).
[34] A stratified social organization appears in most ethnic groups. More research is needed on this subject.
[35] In upstream villages, the life of a long-tail engine seldom exceeds two years.
[36] In theory the Malinau dispensary sends a medical team upstream every three months for check-up, vaccinations, etc.
[37] First, conserving wild boar is problematic. The meat is either pickled in brine or smoke-dried; in both cases it loses its taste. Second, organizing a hunting party to the upper reaches of the rivers is expensive and not profitable as the product of the hunt is traditionally shared among all villagers. Only on special occasions, such as marriages, do Punan families from Respen organize a hunting party in order to provide guests with delicacies.
[38] In the upper Tubu, one child out of two dies before the age of five. This figure drops to one in three in the middle Tubu, and one in ten in Respen.
[39] Underlying motivations to this behaviour still need to be explored. Today local people want their share of the manna from timber extraction. The dominant perception is that the forest will disappear anyway, so better take one's share as quickly as possible. Persistent legal uncertainty is also favouring the unsustainable use of the forest.
[40] It is no surprise that the leading ethnic groups are also the most stratified ones, and that the aristocratic classes of these groups have been able to maintain their dominant position.
[41] Though some food shortages during El Niño years and occasional malnutrition cases have been reported.
[42] Before the implementation of regional autonomy, neither the local administration nor local people benefited from logging. Timber barons had to obtain authorizations from Jakarta and to bribe bureaucracy at the highest levels of the state.

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