

## OUT OF THE FOREST, OUT OF POVERTY?

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### ABSTRACT

That forest people intimately depend on forests for their livelihoods is widely accepted and, so it is predicted, the rapid pace of deforestation in the humid tropics will soon lead them into utter destitution or, worse, drive them into cities. Socio-economic studies recently carried out among Punan hunter-gatherers in East-Kalimantan (Indonesia) somehow contradict this general belief. In remote upstream villages, where natural resources are still plentiful, families barely survive throughout the year, have very reduced monetary income, no access to education and a very high infant mortality rate. In downstream villages, where forest resources are vanishing, families have access to more cash earning opportunities, they enjoy better education and very low infant mortality. From a strict economic point of view, there is a consensus among all Punan: downstream people are generally better off; but when it comes to well-being ... opinions diverge.

*Key words:* Borneo, forest dependency, forest people, household economy, hunter-gatherers, Indonesia, Kalimantan, Punan.

### FORESTS AND POVERTY: IMPORTANCE OF THE ISSUE

It is widely accepted that forest people are poor and that they depend on forests and on forest products for their livelihoods, and it is predicted that the rapid pace of deforestation in the humid tropics will soon lead forest people into utter destitution or, worse, drive them into cities. The famous motto “save the forest” has recently evolved into “save the forest people” or “save the forest for the forest people”.

The defenders of indigenous people argue that the latter should be given full control over their ancestral lands and that this would ensure their conservation and a sustainable stewardship (WCFSD, 1999; Schwartzman *et al.*, 2000; Forest Trends, 2002).<sup>1</sup> Since the early 1990s, much hope has been put into the development of non-timber forest products as ‘the’ solution for saving forests and forest people via extractive reserves, marketing of natural products, certification, eco-labeling, fair trade, eco-tourism and even ethno-tourism (Peters *et al.*, 1989; Anderson, 1990; Nepstad and Schwartzman, 1992; Ruiz Perez and Arnold, 1996).

More recently, governance issues like empowerment of local communities and decentralization won the favour of international bodies. Environment payments to communities for watershed protection, carbon sinking, fire prevention, biodiversity conservation, forest stewardship, etc. are in vogue.

At high political levels there is no doubt that everything must be done to help forest people to stay in the forest. Questioning this basic assumption is considered politically incorrect. And yet, if forest people are poor, why insist on keeping them in the forest? The rationale behind the necessity to save the forest for the forest people is not exempt from romanticism. Do forest people wish to stay in the forest? Our association with the Punan, an emblematic ethnic group of hunter-gatherers of Kalimantan, gives rise to doubts. The Punan are said

- to depend on forest products like sago for their food, yet rice and cassava constitute their staple;
- to need leaves as thatching material, yet they prefer tin roofs;
- to need medicinal plants from the forest, yet they consume huge amounts of modern medicine;
- to consider the forest inseparable to their way of life, yet they run to the city at the first opportunity;
- to need the forest for their survival, yet they are ready to sell it to the first logger to visit their village.

While the Punan are increasingly part of the modern world, all Punan do not experience the same conditions. Some were more or less forcibly resettled by the government in the 1970s to villages downstream (Sellato, 2001; Kaskija, 2002), while others still live in very remote areas four to six days upstream from the nearest city. For thirty years, households of the same ethnic group living under very different conditions have evolved quite differently. Does leaving the forest lead to poverty?

#### **THE SETTING: THE PUNAN HUNTER-GATHERERS OF EAST-KALIMANTAN**

The Indonesian province of East-Kalimantan is home to some 10 000 Punan hunter-gatherers. Scattered all over the province in small hamlets, the Punan, like their Malaysian cousins the Penan of Sabah and Sarawak, are no longer nomads.<sup>2</sup> Mobility, however, is still high, for the individual as well as for the group. Individuals, with or without their family, can move temporarily or permanently from one settlement to another, or migrate to Malaysia for a month or a lifetime. Whole villages can move at once, generally after an outbreak of a deadly epidemic disease.

'Punan' is a generic term, which applies to all groups of hunter-gatherers of Borneo, while 'Dayak' applies to groups of shifting cultivators. There is a huge ethnic, linguistic and cultural diversity among the Punan, but they all originate from groups of hunter-gatherers who probably only started to open swiddens for

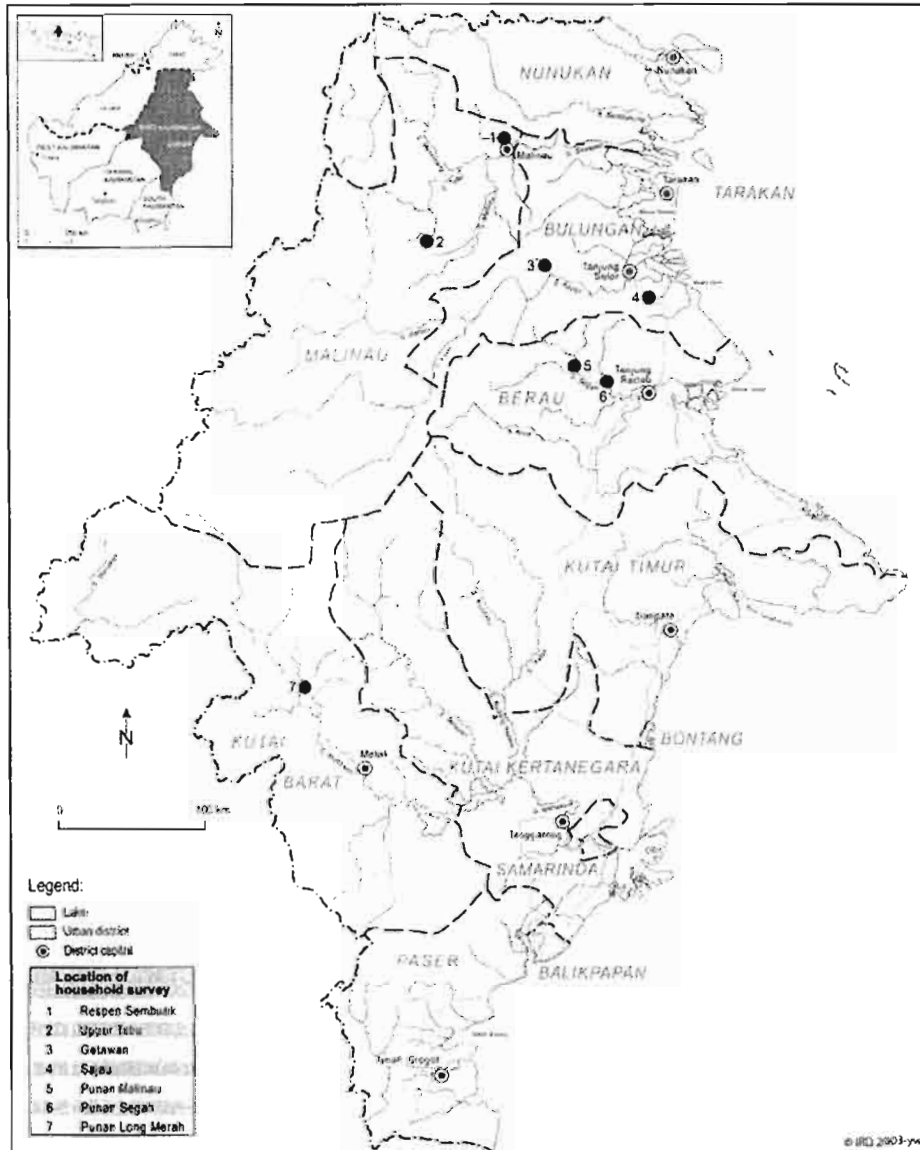


Figure 1. Locality map.

upland rice cultivation by the end of the XIXth century at the earliest and the middle of the XXth century for the last.

The decision to settle is largely a response to changes introduced from the outside world. The *pax neerlandica* put an end to an ancient and active head-hunting tradition among Borneo peoples and opened the interior of the island to traders. With increased exchanges and less dependence on their Dayak neighbours as trading intermediaries, the Punan got more involved in – and reaped more

benefit from – commercial forest product collection of resins and gums, rattan, bezoar stones, eaglewood, etc. The decision to settle down was inseparable from the adoption of swidden cultivation that required families to stay in the vicinity of their *ladang*<sup>3</sup> during the rice cropping season, and even longer if the rice is intercropped with cassava. The Punan adopted lifestyles much closer to those of their Dayak neighbours with a more stratified social organization divided into aristocratic families, free men and bondsmen, the payment of a bride price, and the capitalization of prestige goods like Chinese jars, copper gongs and gold jewelry.

Changes did not stop there. In the resettlement villages, the Punan enjoyed all the benefits of modern technology: outboard engines, shotguns, rice mills, electricity, radio, television, VCDs, etc. and gain access to health care and formal education. This progressive shift away from a subsistence economy and integration into a market economy incited the Punan to draw more heavily on forest resources, especially for cash. With the enforcement of regional autonomy in Indonesia since 2001, district levels enjoy unprecedented wealth. Reduced control from the centre on the periphery translated into increased levels of illegal logging (Obidzinski *et al.*, 2001), and multiple claims by communities for financial compensations from concessionaires (loggers, coal miners). The local economy is thriving, mainly drawing on the last stands of natural forests.

If nothing is done to stop this trend, the high forest of Kalimantan will vanish in the coming 5 to 10 years (Holmes, 2002). If this happens, and it is unfortunately very likely to happen, Punan hunter-gatherers will be left without forests for household consumption and earnings. Such an eventuality is not unexpected by most Punan. Though they pity the fast disappearance of the forest they do nothing to counter the trend. On the contrary, most of them are ready to participate in the plunder. Nowadays in Kalimantan, even NGOs hesitate to label local communities as 'natural conservationists'.

The image of the glorious Punan hunter-gatherer defending his forest against the evil loggers appears blurred. But should we be surprised? A 'conservationist attitude' would require that the net economic benefits that rural people or local users receive from a standing forest exceed the net economic benefits that they might receive from clearing the forest for other uses (Godoy *et al.*, 2002). Angelsen (2001) suggests that in much of the developing world local users receive more benefits from clearing tropical rain forests than from conserving them. It is of the utmost importance to know precisely the relative contribution of the rain forest to household consumption and to household income as rural economies modernize (Cavendish, 2000).

By precisely assessing the present state of the Punan's economy we can determine the actual and predictable level of dependence of Punan households on forests and on forest products for their consumption and earnings. In future, will the Punan be left without resources and will they be able to shift to other activities? The answer to this last question will determine future actions concerning poverty alleviation of forest people in Kalimantan.

## METHODOLOGY

In order to assess the diversity of situations faced by the Punan, we carried out a census of almost all Punan settlements in 6 districts of the province of East-Kalimantan.<sup>4</sup> In 2002 and 2003, with the help of the Yayasan Adat Punan (Association of Punan Communities), 77 settlements were visited with 2,096 families made up of 8,956 individuals.<sup>5</sup> At the settlement level we noted down the presence of facilities like retailers, school, dispensary and market. When a facility was absent we recorded distance and/or time to the nearest facility. At the household level we collected data about all family members: age, relationship to the head of household, gender, level of education and the number of young children who died. Young married couples still living with their parents or in-laws were considered as independent households. Elderly people no longer able to make a living on their own were considered as family members. The quality of housing and sanitation was recorded, as well as the main assets possessed by families – boat engines (long tail and outboard), chainsaws, generators, televisions, VCDs, refrigerators, etc.

Accessibility was the main differentiating factor among villages, so we identified 7 locations for detailed **household surveys** covering the whole range of accessibility, from settlements close to the towns of Tanjung Redeb, Tanjung Selor and Malinau to the remotest villages of the upper Tubu watershed. Altogether 254 households were interviewed in 2003 with the help of the Yayasan Adat Punan.<sup>6</sup> Data collected were: family size and composition, agricultural activities, contribution of forest products (sago) to staple food, main sources of income during year 2002, volume of earnings for forest products collection, off-farm work (regular or incidental), remittances, fees from concessionaires ... Monetary values were reported in Indonesian Rupiah, which at that time (2002) were Rp. 9,000 for US\$ 1. The perception of change by the Punan was judged through an **opinion poll** in two locations – at Respen Sembuak close to the town of Malinau and in the remotest villages of the upper Tubu.<sup>7</sup> In each location, a panel of the young, middle-aged, old, males and females was asked to identify what they considered as advantages and disadvantages of living in their present location. Then 116 villagers in Respen and 81 in the upper Tubu were individually asked to pick the three advantages and the three disadvantages that they considered most important.

## RESULTS

### The 2002–2003 Punan census

The Punan population in the Province<sup>8</sup> amounts to 2,096 families and 8,956 individuals, with 4,595 males and 4,361 females and a sex ratio of 1.05.<sup>9</sup> The average family size by our definitions of nuclear units was 4.3 people.

**Accessibility** appears to be the main cause of heterogeneity among the 77 settlements<sup>10</sup> surveyed, so we ranked all settlements into three classes

- **very remote** regroups settlements located at more than three days travel by boat and on foot;
- **accessible** villages at less than half a day's travel from a district capital;
- all others are clustered in the category **remote**.

Tables 1–4 summarise the characteristics of the settlements in these three classes.

Table 1 summarizes the number of settlements, families and inhabitants in these three classes and their access<sup>11</sup> to four main facilities: school, dispensary, retailers, and market.

Access to **formal education** is improving – 78% of the Punan settlements now have a school – but still lag far behind Dayak villages. The illiteracy rate is still very high among Punan: 41% of the population over the age of 10 are illiterate.<sup>12</sup> Illiteracy figures range from 0% to 100% with an average of 34% for men, and from 10% to 100% with an average of 49% for women. This diversity is sometimes due to socio-cultural factors, but in most cases, accessibility is the main cause.

Illiteracy in very remote settlements is more than twice as high as in villages close to the district capitals. In all categories, female illiteracy is 50% higher than male illiteracy. All differences are statistically significant,<sup>13</sup> between accessibility categories as well as between genders. These results do not really come as a surprise but they imply that, by choosing to live in remote settlements in the middle of the forest, heads of households present their children with difficulties accessing formal education.

Access to **health care** is also very limited as only 36% of Punan settlements are located close to a dispensary or hospital. On average, sanitary conditions are very bad and hygiene – especially among children – proves problematic. In remote settlements it is not unusual to see children sleeping and sharing parasites with the family's dogs, or even eating out of the same plates. While the nutritional state of

TABLE 1

## Access to services

Category	Very remote settlement		Remote settlement		Accessible settlement		All settlements	
No. of settlements	12	15,6%	57	74,0%	8	10,4%	77	100%
No. of families	204	9,7%	1721	82,1%	17	8,2%	2096	100%
No. of inhabitants	863	9,6%	7263	81,1%	830	9,3%	8956	100%
People having access to:								
Retailer	0	0%	5383	74,1%	830	100%	6213	69,4%
School	0	0%	6798	93,6%	830	100%	7628	85,2%
Dispensary	0	0%	2997	41,3%	830	100%	3827	42,7%
Market	0	0%	305	4,2%	830	100%	1135	12,7%
All four services	0	0%	0	0%	830	100%	830	9,3%
No services at all	863	100%	0	0%	0	0%	863	9,6%

Source: 2002–2003 Punan census (Cifor-YAP)

TABLE 2

Illiteracy rates according to accessibility

Category	Very remote settlement	Remote settlement	Accessible settlement	All settlements
Illiteracy male	54.9%	33.5%	16.8%	33.6%
Illiteracy female	76.7%	48.9%	29.9%	49.3%
Illiteracy all	65.8%	40.9%	23.3%	41.2%

Source: 2002–2003 Punan census (Cifor-YAP)

adults is generally good, malnutrition is common among children. Anemia and stunting are frequent and child mortality remains high, especially in remote settlements. If we use as proxy for child mortality the ratio between the number of children who died and the total number of children born,<sup>14</sup> we obtain quite worrying figures (Cf. table 3).

On average child mortality is 5 times higher in very remote settlements than in villages close to towns. Is this higher mortality due to unhealthier life conditions in the forest or to a bad access to health care? Probably both. On one side, the hot and humid environment of the tropical forest favours the development of pathogens and debilitating parasites that are considered a major cause of child mortality (Bahuchet *et al.*, 2000). On the other side, giving adequate medication and putting children on an IV drip are life saving moves, well within the capacity of small dispensaries. During the last five months of 2002, in Long Tami and Long Titi,<sup>15</sup> two neighbouring villages, 26 children and 2 adults died, probably from an outbreak of malaria. The closest dispensary is one day's walk plus one day by river. Had these villages been located closer to the city, most of these children would still be alive.

TABLE 3

Demographic characteristics according to accessibility

Category	Very remote settlement	Remote settlement	Accessible settlement	Statistical significance*
Family size	4.23	4.22	4.85	Yes for AS
Sex ratio	0.97	1.06	1.05	No
<b>Average child mortality</b>	<b>36%</b>	<b>27%</b>	<b>7%</b>	<b>Yes for all</b>
Males under 15	40.7%	35.9%	35.5%	No
Females under 15	42.0%	37.4%	30.3%	Yes for AS
Males over 65	0.0%	2.3%	0.2%	Yes for RS
Females over 65	0.5%	1.9%	0.0%	Yes for RS

\*Kruskal-Wallis and Mann-Whitney tests at 0.05

Source: 2002–2003 Punan census (Cifor-YAP)

Life expectancy among the Punan is also very short, as translated by the very small percentage of people over 65. Accessible settlements also differ from remote and very remote ones by a smaller percentage of children under 15 and a larger size of the households on average. These differences are mainly due to a better access to family planning and to an older age at marriage.

Despite romantic notions about subsistence lifestyles, life is typically tough and short in the forest. By choosing to settle down in a remote location in the middle of the forest, a Punan head of household combines an increased exposure to malaria and contagious diseases with a limited access to dispensaries, and faces the probability of losing one child in three.

### Housing and assets

About 80% of Punan households own their house. One fifth either live in huts on their swiddens or, more often, share a house with a relative. As usual in Kalimantan, houses are made of wood and built on stilts. According to the Punan themselves, poor housing means a bark floor and walls, and a thatch roof. About 13% of all households – but 48% in the remotest settlements – live in such conditions. Only six families own houses made of bricks, and only 3% families have access to toilets and 4% have a bathroom. All others depend on the near-by river.

Nearly half of the families own at least one boat engine (Cf. table 4). In some villages every household owns a motorboat, while in others, as in the upper Tubu, there is sometimes only one boat for the whole village. Chainsaws enjoy a wider distribution among settlements, whilst items like televisions and VCDs are rather common only in villages close to towns with electricity.

TABLE 4

Assets owned by Punan families

Asset	Number of owners			Percentage of families			Total of owners	% of owners
	VRS	RS	AS	VRS	RS	AS		
Long tail engine	57	817	44	27.9	47.5	25.7	918	43.8
Outboard engine	2	93	2	1.0	5.4	1.2	97	4.6
Chainsaw	12	281	16	5.9	16.3	9.4	309	14.7
Generator	0	129	0	0.0	7.5	0.0	129	6.2
Television	1	194	39	0.5	11.3	22.8	234	11.2
VCD	7	180	7	3.4	10.5	4.1	194	9.3
Refrigerator	0	31	1	0.0	1.8	0.6	32	1.5

Note: VRS: Very Remote Settlement; RS: Remote Settlement; AS: Accessible Settlement



### **The household survey (Tables 5–7)**

The household survey gives a more detailed account of the diversity of situations faced by the Punan in East-Kalimantan. Diversity is extreme among settlements and among households of the same village. Heterogeneity is such that average incomes at village level are ineffective descriptors. Quite often the richest household in a village earns 50 to 100 times more than the poorest. Wherever the location, livelihood opportunities are numerous and the family's income is generally a combination of earnings from agriculture, forest products and off-farm work. For two years now, in some areas, a new, sometimes major, source of income has surfaced: fees and compensation paid by concessionaires.

Three major types of Punan settlements emerge from the census and the household survey according to the relative importance of each activity in their portfolio. These types are clearly related to settlement location:

- The diversified type: these settlements correspond to the “accessible” category. They are located close to towns and along roads or major waterways. They benefit from a good access to services and households have multiple opportunities to make a living.
- The gaharu eaglewood collectors: these settlements are located in more remote areas than the foregoing. Heads of households are clients – bondsmen would be more appropriate – of traders from other ethnic groups. They are trapped in debt and highly dependent on their patrons. Eaglewood collection is their main activity – with farming small swiddens for food security.
- The subsistence economies: these settlements are located in the remotest areas of the province. Even traders rarely reach these villages. Households totally depend on agriculture and on forest products for their consumption. Opportunities for cash earnings are rare.

The two first types benefit from fees paid by concessionaires if ‘by chance’ loggers or miners are active in their area.

### **Agricultural activities and income: Table 5**

Upland rice cultivation is the most common activity in all settlements, with 92% of households producing rice that contributes to 81.6% of all meals. Rice is set aside for the family's consumption; surpluses may be bartered for other goods, but are rarely sold. The total rice production in our sample covers 110% of the subsistence needs<sup>16</sup> of the total population, or 131% of the needs of the rice producers themselves. There is however a huge heterogeneity between settlements and families, and only 51% of the households prove self-sufficient. Though the quality of the diet varies over the year, food security does not appear critical. Cassava, corn, taro and other food crops are often intercropped with upland rice for

subsistence needs. Cassava, taro and other cultivated tubers contribute to 14%, and sago only to 4% of the meals on average. Sago's contribution to the households' diet is nil in villages near to the market, but reaches 12% on average<sup>17</sup> in the remotest villages of the upper Tubu.

Table 5 presents – for the three types of settlements- the percentage of families drawing an **income** from agricultural activities. Apart from rice, self-consumption has been omitted as no reliable data are available. Rice production appears remarkably similar in all three types of settlements with a rather low standard error. Other food crops like cassava, corn and taro are not considered in Table 5. Harvested day after day in small quantities, the total production of such crops is difficult to assess. The contribution of agriculture to the total income is thus probably underestimated.

The column 'plantation crops' groups the sale of cocoa and coffee, sometimes fruits. The category 'secondary food crops' groups mainly peanuts and vegetables for sale, while animal husbandry mainly concerns chicken and pigs. These three categories only concern few families, mainly in settlements close to a urban market. In the remotest settlements a large percentage of households (82.9%) sells chicken to visiting traders, relying mainly on bush meat for their own consumption.

TABLE 5

Income from agriculture: cash earnings and rice for subsistence (2002)

Type of settlement	Rice (subsistence)	Plantation crops	Secondary food crops	Animal husbandry	Agricultural income (cash + rice)
<b>Accessible settlement (120 HH)</b>					
HH concerned (%)	91.7%	16.7%	21.7%	16.7%	92.5%
Mean (x 1000 Rp.)*	1811	1166	359	915	2254
Std. Error*	129	964	88	187	243
Contribution to income**	15.0%	1.8%	0.7%	1.4%	18.9%
<b>Remote settlement (99 HH)</b>					
HH concerned (%)	93.9%	23.2%	32.3%	22.2%	93.9%
Mean (x 1000 Rp.)*	1806	788	327	749	2291
Std. Error*	152	303	69	281	214
Contribution to income**	19.9%	2.1%	1.2%	2.0%	25.3%
<b>Very remote settlement (35 HH)</b>					
HH concerned (%)	88.6%	11.4%		82.9%	100.0%
Mean (x 1000 Rp.)*	1739	183		134	1673
Std. Error*	441	108		19	406
Contribution to income**	34.8%	0.5%		2.5%	37.8%

\* Average income and SE for households concerned by the activity only. Total of line does not sum up.

\*\*Concerns all households of the type. Total of line sums up.

Agriculture contributes 19% (15%), 25% (20%) and 38% (35%) of the “cash plus rice” income of accessible, remote and very remote communities – the figures in parentheses being the contribution from rice; other crops contribute less than 5% in all areas.

### Forest products collection: Table 6

Forest products collection concerns a large percentage of households especially in areas with intermediate accessibility. Self-consumption has not been included as no reliable data are available yet. Thus, the contribution of forest products to the total income of households is also underestimated. However, with the noticeable exception of wild boar meat and fat, this contribution is not likely to be very different between settlements.

Birds' nests collection provides rather high earnings but only concerns a very limited number of families.<sup>18</sup> Fish and bush meat have always been the main sources of proteins for the Punan. Recently, in all settlements close to markets, these products have become commercial items and important sources of earnings to some households. Unfortunately, poison fishing<sup>19</sup> and shotgun hunting often replaced the less damaging traditional techniques. Honey gathering as a regular earning has been reported in one area only.<sup>20</sup>

TABLE 6

Cash income from forest products gathering (2002)

Type of settlement	Fish	Gaharu	Birds' nests	Timber	Honey	Bush meat	Others	Total
<b>Accessible settlements (120 HH)</b>								
HH concerned (%)	19.2%	22.5%	4.2%	22.5%		12.5%	2.5%	60.0%
Mean (x 1000 Rp.)*	799	2207	10190	4731		1847	1525	4013
Std. Error*	278	1119	8726	932		507	894	820
Contribution to income**	1.4%	4.5%	3.8%	9.6%		2.1%	0.3%	21.8%
<b>Remote settlements (99 HH)</b>								
HH concerned (%)	13.1%	70.7%	5.1%	8.1%	14.1%	6.1%		79.8%
Mean (x 1000 Rp.)*	251	4132	4280	4075	667	733		4560
Std. Error*	79	1662	3062	2850	147	501		1573
Contribution to income**	0.4%	34.3%	2.5%	3.9%	1.1%	0.5%		42.7%
<b>Very remote settlements (35 HH)</b>								
HH concerned (%)		85.7%	5.7%			17.1%	11.4%	94.3%
Mean (x 1000 Rp.)*		1564	480			255	1798	1715
Std. Error*		484	180			59	710	482
Contribution to income**		30.3%	0.6%			1.0%	4.6%	36.5%

\*Average income and SE for households concerned by the activity only. Total of line does not sum up.

\*\*Concerns all households of the type. Total of line sums up.

*Gaharu*<sup>21</sup> collection is still the Punan's major cash earning forest product, especially in remote and very remote settlements where it makes up about one third of most families' total cash income. Though the species is not on the verge of extinction, *gaharu* is becoming increasingly difficult to find and its collection requires rather costly expeditions. Collectors depend heavily on traders who advance the cash necessary and provide credit to the family members remaining in the village. On average, a collector heads back to the village with finds worth Rp. 300,000 to Rp. 600,000. Less experienced gatherers may come back empty-handed, while lucky ones may hit the jackpot (Levang, 2002). Finds of up to Rp. 60 millions were recorded in the household survey and one household earned Rp. 112 million from *gaharu* alone in 2002. Such lucky finds maintain the motivation of collectors. Generally, once debts are repaid, surpluses are spent on luxury items, boat engines, electronic goods, clothes and alcoholic drinks. After a few weeks' rest in the village, food stocks come to an end, the collector reaches his lending limit at the local store and a new expedition to the forest becomes unavoidable.

Specialized *gaharu* collectors generally stay poor because their priority is to minimize vulnerability and, lacking capital, this is best achieved within a patron-client relationship that, in turn, limits possible exit routes from poverty (Hulme and Shepherd, 2003). Because of the high level of risk<sup>22</sup> and the increasing difficulty in finding good quality products, many traders are no longer interested in the *gaharu* trade. Most are considering investing in the flourishing timber trade. Their privileged relations with Punan controlling huge areas of often not yet logged forests could easily be put to profit (Kurniawan, 2003). Collecting timber rather than *gaharu* would be as profitable but less risky for the trader as well as for the collector. Eaglewood collection is time consuming, tedious and arduous, and generates very low returns. Consequently it is very likely to be abandoned once a more lucrative alternative becomes available (Byron and Arnold, 1999).

Negotiations have already started in many villages and only the absence of easy access by road or by river is preventing logging. Road building has been listed as the top priority in all districts in order to open up the remotest villages. There is no doubt that as soon as the forests become accessible by road, the 'investors'<sup>23</sup> will flock in.

Timber harvesting by individual households is an increasingly important source of income in villages well connected to the market. With the quick development of the new district and sub-district capitals, the demand for local consumption has increased tremendously. Any chainsaw owner can earn at least Rp 200,000 for a day's work. For the time being, at village level, logging has become the easiest and most profitable way to make money. Investing in a chainsaw will provide any head of household with the quickest possible return for very little risk.

#### **Income from non-agricultural activities, fees and compensation: Table 7**

The opening up of the forest areas by concessionaires in Kalimantan since the beginning of the 1970s had a tremendous impact on the forest people. At first, local

TABLE 7

Cash income from off-farm activities and fees (2002)

Type of settlement	Salaried worker	Civil servant	Honorarium	Agric. daily labour	Non-agric. daily labour	Retailer	Gold panning	Handicraft	Remittance	Incidental	Fees	Total off-farm
<b>Accessible settlement (120 HH)</b>												
HH concerned (%)	4.2%	4.2%	26.7%	26.7%	18.3%	0.8%	1.7%	3.3%	5.8%	5.8%	70.8%	97.5%
Mean (x 1000 Rp.)*	10920	14280	2507	243	5779	4000	400	671	1694	6575	4464	6718
Std. Error*	2183	7776	734	57	2250	-	100	362	1260	4097	720	853
Contrib. to income**	4.1%	5.4%	6.1%	0.6%	9.6%	0.3%	0.1%	0.2%	0.9%	3.5%	28.6%	59.3%
<b>Remote settlement (99 HH)</b>												
HH concerned (%)	1.0%	1.0%	13.1%	11.1%	2.0%	3.0%	29.3%	1.0%	8.1%	7.1%	54.5%	82.8%
Mean (x 1000 Rp.)*	6000	18000	3513	175	4200	13933	1539	1550	658	2404	1478	3291
Std. Error*			670	64	3900	11088	303		405	1036	264	563
Contrib. to income**	0.7%	2.1%	5.4%	0.2%	1.0%	5.0%	5.3%	0.2%	0.6%	2.0%	9.5%	32.0%
<b>Very remote settlement (35 HH)</b>												
HH concerned (%)			28.6%	8.6%	2.9%			11.4%	2.9%	8.6%		51.4%
Mean (x 1000 Rp.)*			2510	53	150			145	12000	583		2208
Std. Error*			170	3				64		433		659
Contrib. to income**			16.2%	0.1%	0.1%			0.4%	7.7%	1.1%		25.7%

\*Average income and SE for households concerned by the activity only. Total of line does not sum up.

\*\*Concerns all households of the type. Total of line sums up.

people hardly benefited from the new opportunities as the concessionaires used the more skilled labour force originating from Java, Sumatra or Sulawesi but they gained indirectly with the opening of roads, local markets, schools and dispensaries. The Punan, being the most marginalized, were the last to be able to reap the benefits from this development.

In Table 7, the category "salaried worker" concerns only 4% of households in accessible settlements, and even less in remote areas. Concessionaires are not fond of hiring Punan, or even Dayak, as regular employees. Their technical skill and educational level are generally too low, and work discipline is something totally strange to them.<sup>24</sup> Logging companies however recognize the botanical skills of local people and hire them for inventories and reconnaissance trips. For the same reasons, the category "civil servant" is not very accessible to Punan. Presently, most Punan civil servants are teachers at primary schools in Punan villages. Other jobs in the civil service are allotted through an opaque system combining connections and bribes; Punan are rarely in a position to compete.<sup>25</sup>

"Honorarium" is an important category in both accessible and very remote areas, as it touches one out of four families. Honoraria are paid by government to heads of villages, village secretaries and other notables. As Punan villages are small, all elites benefit.

"Agricultural daily labour" is earned for clearing (felling and slashing) new swiddens, and for harvesting rice. "Non-agricultural daily labour" is a category grouping craftsmen working on a daily or fixed rate, and people occasionally hired by concessionaires or NGOs and research institutes. Both categories are important sources of income in settlements close to the market.

Only very few families are involved in the retailing business. Traders are generally outsiders to the community or in-laws. Punan show little ability in trading; their only potential customers being close relatives many of whom fail to pay, attempts at opening shops are exposed to bankruptcy. Gold panning is a major activity in only one settlement of our household survey. "Handicraft" concerns earnings from the sale of basketwork (rattan baskets and mats) and some other traditional items like blowpipes. The category "incidental" covers occasional earnings from migration. "Remittances" from kin represent an important earning to some families.

Fees and compensations paid by concessionaires in return for the right to exploit natural resources (timber and coal) in areas claimed by local communities make up 29% of total income and affects 71% of the population in the most accessible areas. With the implementation of regional autonomy and the *de facto* loss of control by the central government, the Punan consider this new opportunity as the best way to catch up with their more developed neighbours. The sharing of fees collected from the concessionaires is unequal with the 'Elites' responsible for negotiating with the companies getting the lion's share.

### Contribution of the different sectors to the total income: Figures 2 & 3

The contribution of the agricultural sector appears remarkably similar in absolute terms across all accessibility categories, serving as a security and an insurance against bad luck. The differences between the categories are mainly due to the relative availability of profitable cash earning opportunities: forest products, off-farm activities and fees. What is important is not the access to natural resources per se, but rather access to the market. The remotest settlements are also the poorest, though they have the best access to natural resources. The households in remote settlements do not deliberately opt for a subsistence economy, they just have no other choice. In order to alleviate poverty, securing access to the resource is of no use without securing access to the market.

Figure 3 summarizes the average contribution to the households' total income, regardless of the location of the settlement. The agricultural sector makes the smallest contribution (22%) to the total income, but it concerns 94% of households. The forest products sector contributes to 30% of the total income and concerns 72% households but is the main cash earning activity<sup>26</sup> for only 16% of households. The off-farm sector provides the highest contribution to the income of the greatest number of households in all areas with good to fair accessibility.

Are Punan households depending on forest products for their cash earnings? Yes, especially in the remote to very remote areas. However cash income from forest products is much lower in very remote areas as the collection cost becomes prohibitive and as fewer traders remain interested in the *gaharu* trade. Are Punan households dependent on the forest? Yes, and even increasingly so. With the opening up of the remotest forests by road building, a growing number of Punan will increasingly rely on fees from loggers as their main source of income. The

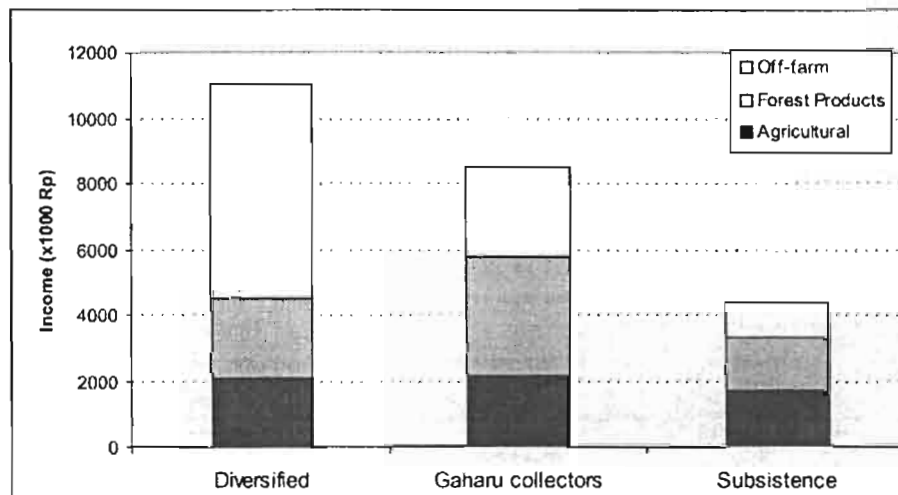


Figure 2. Sectoral contribution to household income according to settlement type.

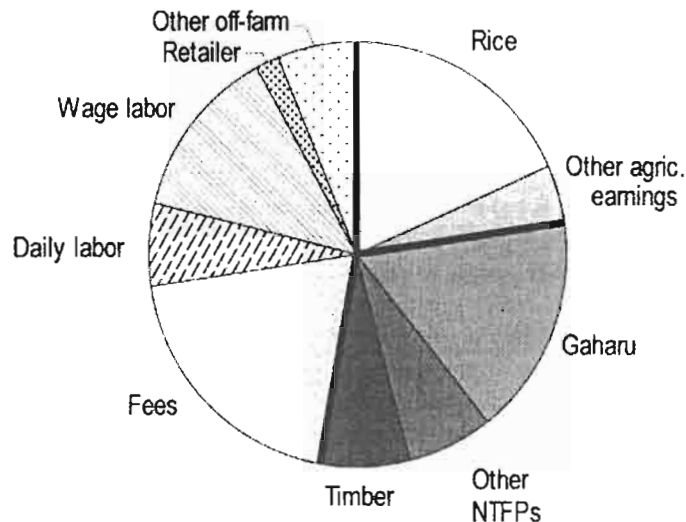


Figure 3. Average contributions to total income (2002).

future of Borneo's forests is already a serious matter of concern and the trend unfortunately strengthens the most pessimistic predictions.

### Household and settlement specificities

Are Punan households poor?<sup>27</sup> With an average income of more than Rp 9 million per year, the Punan are far from being poor – according to Indonesian standards. However, the range from the poorest (Rp. 180,000 per year) to the richest household (Rp. 121 million per year) is quite impressive (cf. figure 4). This huge range is essentially due to factors linked either to the settlement's location or to households' specificities. About 83% of households are under the US \$ 1 a day per capita poverty line. According to the Indonesian standards of poverty for East-Kalimantan<sup>28</sup> defined by Pradhan *et al.* (2001), about 39% of households in our sample are under the poverty line (just over 1 million Rp per year or approximately US\$0.3 per day). This ratio is not very far from the 35% of poor in East-Kalimantan rural areas obtained for 1999 by the same authors.

The highest occurrence of poor families is found in the remotest areas. There, households depend strictly on their swiddens for their staple foods and on forest products for their cash earnings. The contribution of forest products for consumption<sup>29</sup> is very high, especially for wild boar meat, the Punan's favourite, but cash earnings are problematic. In the upper Tubu, for instance, 66% of the households in our survey are under the poverty line as defined by Pradhan *et al.*



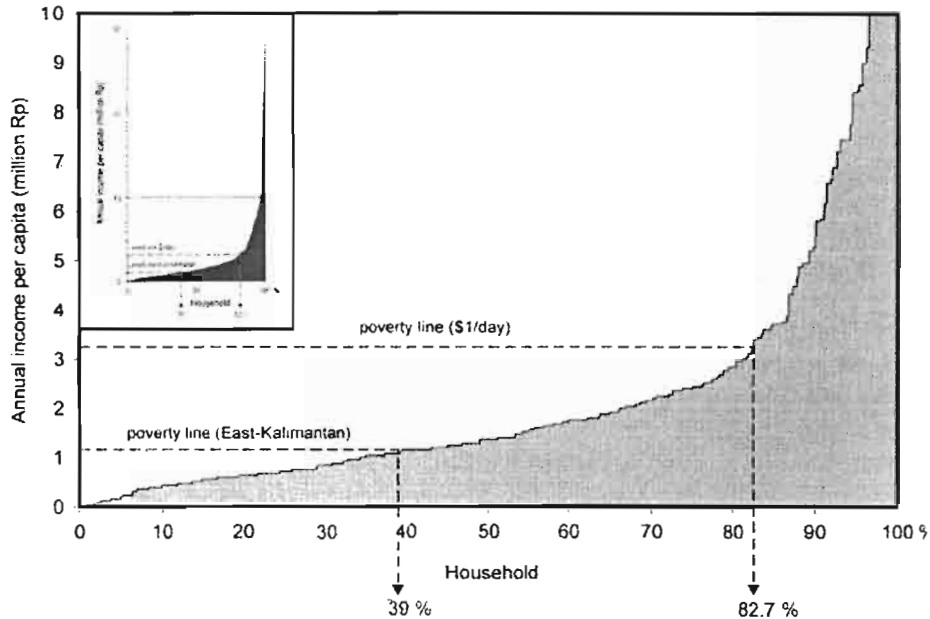


Figure 4. Distribution of annual income per capita (2002).

In intermediate locations, most households make a living from *gaharu* collection. In settlements that do not benefit from fees paid by logging companies, families are on average close to the poverty line, but wherever fees are made available all families move above the poverty line.

In locations well connected to the market, only very few families can be labeled as poor. In Respen Sembuak, for instance, only 23% of households are under the poverty line as defined by Pradhan *et al.* In such villages, there are usually more job opportunities than people willing to grasp them. The contribution of forest products to household consumption is close to nil, something often resented by elderly women who remember the good old days when wild boar was plentiful and free.<sup>30</sup>

### Opinion poll<sup>31</sup> : pros and cons for living in and out of the forest

*Do forest people live in the forest by free choice or by obligation?*

Among the eleven advantages of living in the forest recorded by the communities of the upper Tubu, the abundance of forest products for food comes first (77% of votes). The free and easy access to land to open swiddens comes second (65%) and the availability of forest products for materials comes third (54%). Other

advantages appear as secondary to the people polled. On the negative side, the absence of dispensary and medicine comes first (67%), the high price of basic goods (59%) and the bad accessibility (41%) follow.

In Respen Sembuak, the main advantages of living close to the city of Malinau are: easy access to health care (76%), access to formal education (58%), followed by the access to information (37%), and the numerous work opportunities (33%). On the negative side, the lack of security comes first<sup>32</sup> with (62%), followed by drug and alcohol abuse (54%) and by the loss of the Punan culture (45%). These results are not very surprising and much in line with other forest people in the world (Bahuchet, 1994; Bahuchet *et al.*, 2000).<sup>33</sup>

The Punan definitely want to change their way of life. They want to be part of the modern world, not to lag back in destitution. They want to benefit from all what the outside world has to offer, and in order to reach this goal, they are ready to sell their forests.

## CONCLUSION

Are Punan an exception or the archetype of forest people? What is the future for forests and forest people?

### Preserving forests for forest people?

The great importance attached to forests and forest products for the livelihood or even the survival of forest people is without doubt linked to one of the most persistent and popular myth in the Western civilization: Jean-Jacques Rousseau's concept of the noble savage (Redford, 1990).

There is no doubt that indigenous people have an impressive practical knowledge of their environment (Alvard, 1993; Bahuchet *et al.*, 2000), but maintaining a balance with nature is not their priority (Hames, 1987). The balance between traditional native groups and their environment has more to do with low population densities, limited access to the market, and limited technology than with any natural harmonious relationship with nature (Ellen, 1986; Alvard, 1993). As soon as the forest-dwellers gain access to the market economy, the increased need of surpluses for cash renders traditional techniques totally obsolete (Redford, 1990; Stearman, 1994). The Punan culture has nothing like a traditional ideology of harmony with nature, or an explicit organic link with the forest (Sellato, 2000).

'Extractive reserves' where forest people carry on in an undisturbed way the wonderful life of the noble savage is considered by some as the only way to halt the expansion of forest clearing (Schwartzman *et al.*, 2000). It cannot be claimed as a realistic scenario for the improvement of forest peoples' livelihoods (Redford and Stearman, 1993; Stearman, 1994; Terborgh, 2000). Our data show that the Punan are entering the modern world and claiming the right to basic infrastructures like schools, dispensaries, roads and airstrips. Relegating the Punan to their forests, and

thus to a backward way of life, would be tantamount to condemning a whole population to illiteracy and one child out of three to death.

### **Preserving forests as a safety net for the poor?**

Since the early 1950s scholars have been saying that rainforests provide security to rural people against misfortunes such as crop losses, floods, famines, droughts, and wars (Falconer and Koppel, 1990; Arnold, 1998; Byron and Arnold, 1999; Warner, 2000). Testing this hypothesis has led to rather contradictory conclusions. Forest people rely on many forms of informal insurance like gifts and loans, remittances from urban kin, credit, savings, their own assets, out-migration, wage labour or even theft ... and very little on forests (Wong and Godoy, 2003). Forest product collection only appears important to households when other, cheaper forms of consumption smoothing options are not available (Morduch 1995; Clement *et al.*, 1998; Godoy *et al.*, 1998; Pattanayak and Sills, 2001). With improved economic well-being, low-income households become less dependent on forests (Fisher *et al.*, 2002; Wong and Godoy, 2003).

For the Punan, dependence on the forest is greatest in the remotest areas where other options are fewer. Forest dependency is not considered as an attractive, viable option, but rather a last resort – a symptom of their limited options – that they will abandon as soon as any better option emerges (Byron and Arnold, 1999).

### **Claiming the forest**

The Punan claim secure tenure rights over their homelands. Dispossessed by the central government, today they are facing the greed of their more powerful and better connected neighbours. The Punan deserve secure rights over their lands. However secure tenure rights will not save the forest. By claiming ownership over forest land, the claimant first seeks to prevent outsiders from accessing those resources. The widespread belief that support for indigenous peoples is equivalent to conservation of nature (Posey, 1985; Lonsdale, 1987; Bunyard, 1989), is considered fallacious by other scholars (Redford and Stearman, 1993; Redford and Sanderson, 2000) and definitely not true in the case of the Punan. The importance of biodiversity conservation rests upon a broad spectrum of ethical, moral, economic arguments mainly proper to urban elites of the North. The need to conserve Nature for aesthetic or future commercial use does not appeal to, and has little chance to be adopted by indigenous people in the South (Horta, 2000). Providing secure tenure rights to the Punan will – want it or not – enable them to strike better deals with the loggers. Quite contrary to *gaharu* collection, fees paid by concessionaires have the potential to become a pot from which to draw until the last economically interesting log has been pulled out of the forest; this will probably not take long.

### **Alleviating poverty**

By Indonesian standards, the only Punan who can be considered poor are those living in the remotest settlements that have the best access to forest resources and the lavish bounties of Mother Nature. An unhealthy environment, a dubious hygiene and a total lack of access to health care makes 'living in harmony with nature' a dangerous gamble. The extremely high infant and child mortality and short life expectancy fall well below acceptable standards even in third world countries. High rates of illiteracy are also a strong handicap for any development initiative.

### **Providing services**

Alleviating poverty necessitates securing access to health care and education in the remotest areas. Thanks to individual initiatives and to the help of the Yayasan Adat Punan, some schools have been opened in remote villages. Securing funds for the building of the school proved easier than securing a regular wage to the teachers. Independently from financial problems, none of the teachers – educated Punan already accustomed to live in towns – could endure reclusion in the forest for more than a couple of months; even highly motivated ministers of religion hold on with difficulty. Dispensaries are still lacking in many of the less remote areas so isolated Punan settlements have the lowest priority for health services.

### **Providing access to the market**

Building roads would open up the remotest areas. No longer isolated, the area would eventually be able to recruit and retain teachers and health workers. Better access to the market would considerably lower the price of essential goods and open new opportunities for local products. The building of roads is the dearest wish of all isolated forest people and a top priority in all districts. However, road building also presents a major risk for the forest (see for instance APFT 1999). Presently, the absence of outlets is the only efficient way to prevent illegal logging.

### **Providing a better integration**

Some thirty years ago, the Indonesian government resettled whole villages closer to towns where they could benefit from better access to services. This policy has been much criticized in the past. Now, one has to confess, the economic, health and educational conditions are far better in the resettlement areas than in the areas of origin of the villages. Though many severe social, cultural and political problems still remain unsolved,<sup>34</sup> there is no doubt that resettled Punan are better integrated into the modern economy.

The forest people living in remote areas now aspire to a more secure life; relieving their poverty will be costly and need the help of the international community.<sup>35</sup> They do not need some romantic Westerners to confine them in an anachronistic way of life, which traps them in poverty. Environmental payments could be considered as a relevant option to both preserve the last stands of high forest and to alleviate poverty.

The Punan have a dream: they want to catch up with their more developed neighbours and become rightful members of the modern world. What they do not know however, is that in order to reach their goal they will have to give up their culture, their values, and their social organization.

Even if they knew this, they would probably regret it but still carry on their way. For the time being, the forest is all they have got. But does this mean that they will be left without resources after the last log has been pulled out? Probably not. The Punan have already shown that they are very opportunistic. They have switched from sago collection to rice cultivation. They switched from one forest product to another: from dammar to rattan, *gaharu* and timber. They may switch to plantation crops, forestry plantations, ecotourism, or any other opportunity. Clearly, education and capacity building will determine the new opportunities. People in villages close to cities will have a definite advantage over the communities living in remote settlements. The Punan have no choice other than integration or increased marginalization. Alleviating poverty and preparing the future means facilitating integration. Therefore we should not focus on romantic ways to help the last Punan to stay in the forest if it is not their choice. To forest people, the best choice might well be to get out of the forest, in order to get out of poverty.

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## NOTES

- 1 For the promoters of devolution: “There is growing evidence that local community-based entities are as good, and often better, managers of forests than federal, regional and local governments. In addition, biologists and protected area specialists are beginning to change perspectives on human interactions with nature, acknowledging that the traditional management practices of indigenous peoples can be positive for biodiversity conservation and ecosystem maintenance. This positive outcome is best gained by devolving control of forest land to communities” (White and Martin, 2002).
- 2 Among the Malaysian Penan, only 4% of approximately 10,000 people could still be categorized as true nomads in the beginning of the 1990s (Langub, 1996).
- 3 *Ladang* is the Indonesian term generally used for upland rice swiddens.
- 4 The province of East-Kalimantan covers 211,140 km<sup>2</sup>. The district of Malinau alone (42,000 km<sup>2</sup>) is larger than the Netherlands.
- 5 Our data does not include the Punan Basap, a small isolated group of the Berau District with no relations with other Punan groups.

- 6 Sampling intensity was higher in peri-urban areas because of a higher heterogeneity due to numerous – and often site specific – income opportunities.
- 7 Respen Sembuak is a resettlement area of villages originating from the upper and middle Tubu. Families of both areas are related and visit each other more or less frequently; all know about the living conditions prevailing in the other location.
- 8 The Punan Basap are not included.
- 9 The sex ratio is even or slightly in favour of women for classes under 25. Over 25 all classes count more men than women. This inversion is probably due to the greater rate of out-marriages for Punan women compared to Punan men. Maternal mortality might also be at issue, as the shorter life expectancy of women hints.
- 10 Many settlements do not enjoy the official status of village. All settlements located at a distance from the village they depended on were considered as independent entities. Where villages were regrouped in one resettlement location but kept their status, we considered each village independently.
- 11 We consider that a family has access to a facility when it is either located in the village or at a short distance.
- 12 Illiteracy figures for Indonesia – excluding the easternmost provinces of Maluku and Papua – amount to 9.29% (BPS Indonesia, 2002). Figures for East-Kalimantan are 2.59% for males, 5.93% for females and 4.19% for the whole population over 10 years of age (BPS Kalimantan Timur Dalam Angka tahun 2002).
- 13 Kruskal-Wallis and Mann-Whitney tests at 0.05
- 14 Data about age or date of birth or death are highly unreliable among the Punan. Presently we are not in a position to present more reliable figures in a classical format (annual per million figures). Therefore we use the proxy : ratio of “number of children who died” per “number of children born”. Most of the children died before the age of 5, but the figures probably also include some children older than 5. The figures should not be considered in the absolute but for comparison between remote and accessible areas.
- 15 The villages of Long Tami and Long Titi respectively number 17 and 23 families.
- 16 According to an average annual rice consumption of 150 kg per capita (Indonesian national average).
- 17 Sago makes a contribution to the diet in 54% of the households in the upper Tubu. To these households the contribution is 22% of the total staple.
- 18 Birds' nests have been very disputed resources for centuries in Borneo (Sellato, 2001) and the Punan generally lost control over the caves to the benefit of their more powerful Dayak neighbors.
- 19 Poison fishing and use of electric gear is a common technique among Dayak and migrants in areas close to markets. However, most Punan seem reluctant to use pesticides for fishing.
- 20 The sub-district of Segah in the district of Berau.
- 21 *Gaharu* is the Indonesian name for eaglewood or agarwood (*Aquilaria malaccensis*). *A. malaccensis* and related species produce a fragrant and highly valuable resin as a result of pathological wounding (Momberg *et al.*, 2000).
- 22 Much of the traders' capital is at the hand of numerous collectors, while repayments are often problematic.
- 23 'Investor' is the local name for timber barons involved in logging (both legal and illegal).
- 24 After a few days work, they might well leave the camp in order to join a hunting party and only show up again weeks later.
- 25 In fact, the same system prevails at the Ministry of Education. But as non-Punan teachers are reluctant to be posted in Punan villages, the Punan are offered an opportunity.
- 26 That is to say the activity contributes to more than 50% of the household's total income.
- 27 Throughout this paper we focus on the economic dimension of poverty. Other dimensions, like the cultural for instance, are not less important but seldom considered in the literature.
- 28 Poverty line for East-Kalimantan rural areas was calculated at Rp. 92,977 per capita per month in February 1999.
- 29 The assessment of the actual contribution of forest products to household consumption is still under way.



- 30 "Nowadays if you want to eat you have to pay" is a popular lament in resettlement areas.
- 31 The detailed results of the poll will be presented in a separate publication.
- 32 Insecurity is primarily linked to alcohol and drug abuse but also to land disputes.
- 33 "Forest people deplore the disappearance of the forest and of the fauna, but they sell bush meat and work for logging companies. They praise the specificity of their political and social organization, but do not want to be confined in a backward lifestyle. They want to see their community thrive, but they move to towns, resettlement posts or concessionaires' camps to benefit from immediate wealth. They praise the efficiency of traditional techniques, but rush to buy manufactured goods. They wish to preserve their religious practice and medicinal plants, but frequent dispensaries and follow the new beliefs" (Bahuchet *et al.*, 2000).
- 34 Since the implementation of regional autonomy and the revival of the customary "*adat*" law, conflicts over land often turn violent and nowadays many Punan consider moving back to their tribal land.
- 35 We are not unconditional advocates of integration. Integration presents advantages but also many drawbacks. Forest people want to acquire the goods procured by the outside world, especially those making their life easier: outboard engines, chainsaws, generators, rice mills, rice cookers ... and less boring: radios, televisions, VCDs. By opting for integration, they often have to leave their ancestral lands and feel uprooted, marginalized, and experience poverty or, worse, the feeling to be poor. Change goes hand in hand with conflicts between generations, a loss of prestige and authority of the elders, social disorder, alcoholism and sometimes prostitution (Bahuchet *et al.* 2000). However, integration is what most forest people want.

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Out of the forest, out of poverty ?

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