

## Chapter 22

# Rattan (*Calamus* spp.) gardens of Kalimantan: resilience and evolution in a managed non-timber forest product system<sup>1</sup>

*Fadjar Pambudhi<sup>2</sup>, Brian Belcher<sup>3</sup>, Patrice Levang<sup>3</sup> and Sonya Dewi<sup>3</sup>*

Common names	Part of the resource used	Management	Degree of transformation	Scale of trade	Geographic range
Rotan, Rattan	Stem	Cultivated	Medium	International	Large

### OVERVIEW

Rattan cultivated as part of the traditional swidden agricultural system has been a major source of internationally traded rattan raw material and, more recently, the basis of a strong domestic furniture and handicrafts industry. The rattan gardens of Kalimantan provide an example of an intermediate non-timber forest product management system that is well adapted to the local economy and ecology. Over the past two decades, however, important changes have taken place, changes that tested the resilience of the system. Government policies designed to encourage the domestic processing industry and monopsonistic manufacturing association have sharply depressed demand and prices. New developments in the region, in the form of roads, industrial plantations, mining, and other new economic activities, have both actively displaced existing rattan gardens and offered attractive alternatives which have led some rattan farmers to shift to new activities. Recent widespread forest fires have destroyed large areas of rattan gardens, effectively forcing some rattan farmers out of business. Under current conditions, with low prevailing demand and prices, rattan gardens are a marginal activity in purely financial terms. They remain important, however, where competition for land is low because they fit well with the swidden cultivation system that is the economic mainstay in the region. Moreover, rattan gardens provide valuable ecological services, in terms of biodiversity conservation and other forest functions. As rattan remains an important commodity in Indonesia and internationally, the rattan garden system may remain viable, at least in the medium term.

## INTRODUCTION

When travelling through rural areas of East Kalimantan, in the Indonesian part of Borneo, a visitor soon becomes aware of the importance of rattan, the spiny climbing palms. From baskets to mats to ropes or even as a side dish in meals, to mention just some of the multiple uses, rattan has played a fundamental role in Borneo since ancient times. It is ever-present in daily life, in the mats one sits on, the baskets carrying produce, the binding holding together houses and tools. Bundles of rattan stems can be seen drying, moving down river in small boats and being stacked in the warehouses of towns. Most rattans grow wild in the forest, but in this part of Indonesia several species are cultivated as part of the traditional swidden agricultural system. The rattan trade has long played an important part in the local and national economy, and the system itself provides a very interesting model of an intermediate management system for forest product production.

Here we will examine the system and its evolution, to understand better the factors that promote such an intermediate management system, the factors that may undermine such a system, and the reasons for the apparent resilience of this system in some places. This chapter provides a synthesis of recent research, drawing on several component studies with the aim of understanding more about the role and potential of this particular management system. The primary analytical approach is a comparison of intertemporal and interspatial differences in the importance of rattan in household economic strategies. We test the hypothesis that changing social and economic conditions are making rattan gardens relatively uneconomic, ultimately leading to abandonment of the system. The main questions we seek to answer are: (1) Are rattan gardens a viable economic option now and in the future? And (2) what are the general lessons about intermediate management systems for non-timber forest products?

## Research area

The Center for International Forestry Research (CIFOR) and the Center for Social Forestry, University of Mulawarman have been involved in a collaborative research activity designed to investigate the changing role and potential of forest products in household livelihood strategies under rapidly changing socio-economic conditions. Research has taken place in villages in Pasir and Kutai districts, including Besiq village (see Box 1).

### Box 1: Besiq village

Besiq village, Damai subdistrict, in Kutai district was one of the research villages and served as the study area for the Case Comparison Project. The Damai subdistrict covers an area of 343,870 ha and consists of 19 villages, mostly occupied by Dayak Benuaq people. The distance between Samarinda (the capital of East Kalimantan) and Damai village (the subdistrict principal) is approximately 357 km. Besiq village is located about 33 km upstream from Damai village. In Besiq the average population density is 2 persons/km<sup>2</sup> and the village covers an area of 585 km<sup>2</sup>; it is the largest village in this subdistrict.

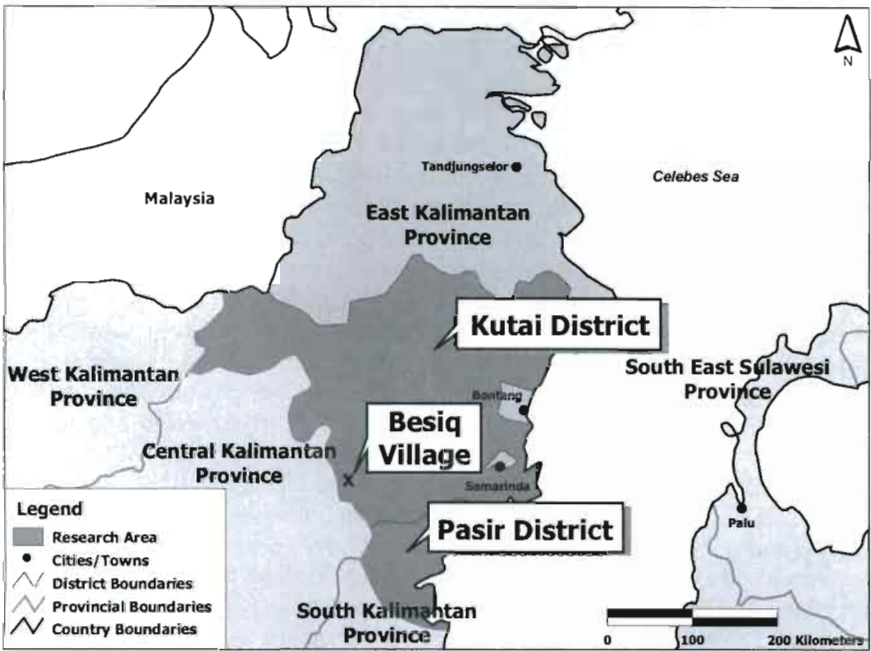
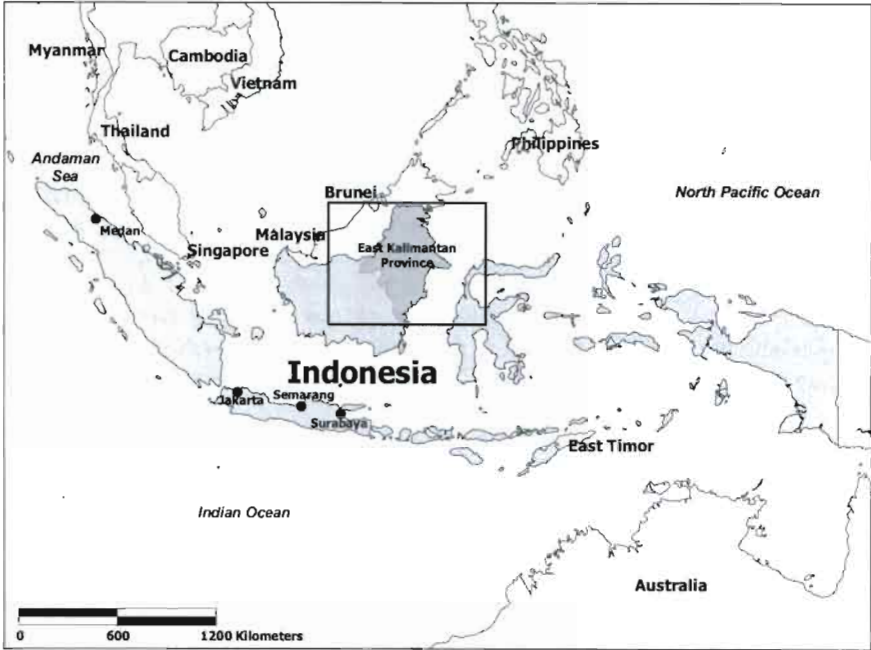
In Pasir and Kutai districts in the Indonesian province of East Kalimantan (see Figure 1) people are mainly indigenes (Dayak tribes) who live in scattered villages and practise swidden agriculture. Rice is the mainstay, but they grow several other field crops and supplement by hunting, fishing and collecting from the forest and increasing integration in the cash economy. The study area was selected because there is a high level of traditional forest use by people living in the area; the traditional rattan gardens of the area represent an interesting and important intermediate-intensity forest product production system; and the area is currently undergoing rapid externally generated changes such as building of new roads and large-scale establishment of oil palm and pulp plantations, which lead to new pressures and opportunities for people living in the area. This combination of factors makes the area interesting for a study of the changing role and importance of forest products.

### The development of rattan cultivation

The origins of the rattan cultivation system in use in Kalimantan are not well documented. It probably dates back to the mid-nineteenth century (Van Tuil 1929). The evidence suggests that rattan gardens originated in the areas around Barito, Kapuas and Kahayan rivers in Central Kalimantan (Van Tuil 1929). From there the system spread to other areas in South and East Kalimantan. Most authors agree that in East Kalimantan rattan gardens were introduced first in the Pasir region in the late nineteenth century, when the Sultans granted land to promote its cultivation, and later expanded to the middle Mahakam area, favoured by the Sultan of Kutai (Weinstock 1983; Mayer 1989; Fried and Mustofa 1992). Village elders in the survey area recounted similar stories. They mentioned that it was the Sultan of Kutai who encouraged rattan cultivation, but they did not know when or how this occurred. However, most village elders reported that rattan was only a secondary forest product during the colonial period. Rattan was collected in the wild and occasionally traded. Other forest products, such as resins and gums, were the main sources of cash income for local people before independence in 1945. Rattan was sometimes planted in *ladang* (swidden fields) close to dwelling places, mainly to meet subsistence needs. During the colonial period, and even until the 1960s, iron was scarce in Kalimantan and nails were a luxury item. Rattan was indispensable as a binding material to tie up poles and beams in traditional construction and in the manufacture of many utility items.

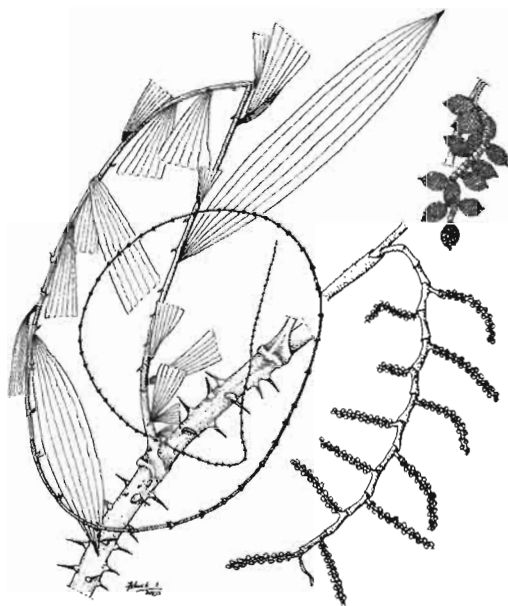
We can only speculate about the domestication process. It is a relatively small step from wild gathering to planting within a *ladang*. The rice-swidden system and the main cultivated rattan species have coexisted in the area over millennia. These rattans produce a large amount of fruit and the seeds germinate easily. They are multistemmed varieties, so repeated harvesting is possible. The rattan cultivation system fits extremely well with the current agricultural system, based on swidden farming with rice as the main staple crop. Rattan seeds or seedlings can be established simultaneously with the rice crop at very low extra cost. Our studies show that it requires an extra 7 or

Figure 1. Location of the study area



Source: ESRI Data and Maps 2002.

8 man-days in the first year, and small inputs for weeding and protecting the young rattan plants afterwards. Once established, rattan plants can be harvested periodically, with simple technology, over a long period of time for just the cost of harvesting labour (cutting and carrying). Most likely an intensification of the system to the current situation occurred with the entrance of rattan in the international trade in mid-nineteenth century.



(*Calamus caesius*)

## PRODUCTION TO CONSUMPTION SYSTEM

### The cultivation of rattan in a shifting cultivation system

The details of the current rattan planting practices vary from farmer to farmer and place to place, but the basic elements are consistent. The rattan cultivation system in Kalimantan has been described frequently in the literature (Weinstock 1983; Mayer 1989; Godoy 1990; Fried and Mustofa 1992; Peluso 1992; Boen *et al.* 1996; Belcher 1997; Eghenter and Sellato 1999). Farmers start the swidden cycle in May by slashing undergrowth vegetation, followed by felling the trees in a selected area of primary or secondary forest. In August, after a drying period of a month or so, the field is burned, and by September farmers start planting the hill rice that will be harvested in February. The main agricultural crop is upland rice, along with maize, cassava and banana among other food crops. Farmers plant rattan seeds, wildings or seedlings in a newly created agricultural field (or *ladang*) as part of this shifting cultivation system.

The main rattan species used is *Calamus caesius*, known locally as *rotan sega*. Several other species are also grown, including *Calamus trachycoleus*, or *jahab*; *Daemonorops crinita*, or *pulut merah*; and *Calamus pinisillatus*, or *pulut putih*. The young rattan plants are protected in the *ladang* and, when the farmer shifts to a new swidden plot one to two years later, the rattan is left to grow with the secondary forest vegetation to create a *kebun rotan*, or rattan garden. The average size of such rattan gardens is 1.4 ha and the density of rattan clumps ranges from about 50 per hectare up to 350 per hectare, with a mean of around 170 per hectare (García-Fernández 2001).

Harvesting of *C. caesius* typically commences 8 to 10 years after planting. *Daemonorops crinita* and *C. pinisilatus* mature more quickly. *C. caesius*, and most of the other cultivated species, have multiple stems and can sustain repeated harvests. Thus, the rattan gardens can be harvested periodically over time. Farmers report that production peaks between 24 and 30 years after planting and begins to decline between age 37 and 43 (García-Fernández 2001).

Photo 1. Collecting rattan from a garden (Photo by B. Belcher)



### Socio-economic context

Based on a regional survey, the 53 villages in Kutai and Pasir districts were classified into three groups according to the economic importance of rattan at the village level as well as in terms of land use cover. The three groups are: (1) 'active rattan villages'—those which maintain a high level of activity in rattan growing, where the majority of households depend on rattan as the main income source and where rattan gardens are a major land use (see Box 2 for an example);

(2) 'stand-by rattan villages'—those which retain existing rattan gardens but have a lower level of economic activity in rattan, where rattan income does not play a major role in overall income but it is still important in terms of land use cover; and (3) 'ex-rattan villages'—where rattan is unimportant as a source of income and not a major land use, where people have shifted to other activities. A general description of the main differences among these groups is presented in Table 1, which summarises data from an extensive, detailed database built with the information collected in a regional survey.

### **Box 2. Besiq, an active rattan village**

Besiq village can be classified as an 'active rattan village'. Out of little more than 350 households, 334 are commercial raw material producers. Based on a household survey more than 85% of the annual cash income per capita comes from rattan. There are nine first order traders (traders who buy from raw material producers) involved in trading raw material, who sometimes receive advance money from processing firms in Samarinda. Most of the raw rattan producers know accurately what the rattan is used for, but few know the price paid for raw material by second order traders. The co-operative agency Koperasi Sokaq Maju is concerned with rattan production in Besiq, but fewer than 40% of the producers participate, since many villagers find the agency unreliable. Ownership of rattan gardens is arranged according to traditional Dayak law, and all villagers are aware of and respect the traditional rules governing ownership. However, some of the traditional regulations on land ownership are in conflict with the state law.

Stand-by villages represent an intermediate stage between active and ex-rattan villages. On the one hand, active rattan villages show a more subsistence dependant strategy with less integration in the cash economy. They have lower monthly expenses and own fewer consumer goods (indicated by number of television sets). As well, people in these villages tend to have higher interest in trading other forest products, including timber, honey, *gaharu* and damar (unpublished data collected by the authors). On the other hand, in ex-rattan villages income tends to be more heavily based on cash crops and gold; rattan has been displaced by new, more profitable activities.

A spatial analysis showed clear patterns. Generally speaking, villages in Kutai were more likely to be active in rattan growing, while villages in Pasir were more likely to have abandoned rattan farming. The economic importance of rattan is correlated with variables such as the importance of rattan in the neighbouring village, ethnic make-up of the village, district, distance to the subdistrict capital by river, and distance to the nearest main town (trading centre) by river.

**Table 1.** Description of village groups (average values)

Groups	Number of villages	Number of households	Monthly expenses per household (US\$*)	Percentage of households with TV	Number of students		Products that contribute to household income (in order of importance)
					Primary school	High school	
Active rattan	28	113	34.13	6	9	6	Rattan, fruit
Stand-by	15	124	37.50	13	10	7	Rattan, rubber, fruit
Ex-rattan	10	171	40.63	15	72	22	Gold, coffee, rattan, rubber

\*Exchange rate used: US\$1 = Rp8,000.

Source: Village survey 1999/2000.



## Developments in trade and processing

The rattan stems are cut, cleaned and dried for sale through a network of traders. The main market for the primary cultivated species used to be the *lampit* (rattan mat) industry in South Kalimantan, which has since largely collapsed (as discussed below). Now the furniture and handicrafts industries, primarily located in Java, are important buyers. A substantial portion has also been smuggled to Malaysia (Haury and Saragih 1996, 1997) and on to other countries with large rattan furniture manufacturing industries (especially the Philippines and China).

Photo 2. Making lampit (Photo by B. Belcher)



Village elders report that rattan cultivation gained importance after independence, when rattan prices reached high levels. Rattan became a major economic crop at the end of the 1960s with the growing motorization of river transportation and an increasing number of traders and exporters. The main driving force were regular increases in rattan prices. At the same time, other sources of income were lost as forest products that had been important, such as resins and gums, became less valuable. The rapid development in Malaysia and Indonesia of *hevea* rubber plantations in the 1920s and 1930s meant reduced importance for the gums. Resins followed the same path with the development of synthetic substitutes around the time of World War II. Locally, village elders lay the blame on logging companies, who removed the big resin producing dipterocarps. By the end of the 1970s, rattan became the main source of income in most villages, as many farmers concentrated on rattan cultivation and purchased rice to meet their requirements.

The economic role of rattan was exaggerated in the 1980s with the rapid development of the *lampit* industry in South Kalimantan. In 1984 there were just 21 *lampit* manufacturing enterprises in Amuntai, the centre of the industry, producing 64,000 m<sup>2</sup> of *lampit*, valued at US\$366. By 1987 the industry was at its peak, having swollen to 435 units producing over 1 million m<sup>2</sup> of rattan mats worth US\$4,612 (see Figure 2).<sup>4</sup> The industry used cultivated *Calamus caesius*, and demand and prices reached unprecedented highs (see Figure 3). Farmers report that competition among buyers was fierce. Traders would come to the villages, offering advances of cash and consumer goods to secure rattan supplies. But good things don't last, and this boom was short-lived.

### Government involvement and its implications

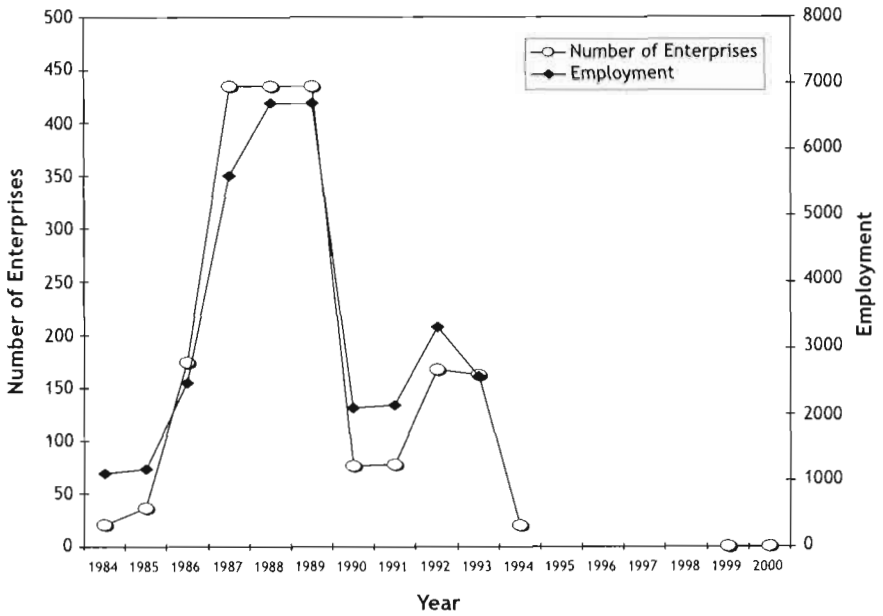
There has been a tradition in Indonesia of heavy government intervention in resource industries, often in collusion with powerful private interests (de Jong *et al.* 2003). The boom in the rattan sector in the 1980s attracted the attention of some of these people, and a series of regulations were swiftly put in place to try to capture some of the profits being generated. Some of these policy instruments affecting rattan in Indonesia were:

- a ban on the export of unprocessed (raw) rattan in October 1986
- a ban on the export of semifinished rattan in January 1989, replaced in 1992 with a prohibitive export tax
- the reclassification of rattan webbing as a semifinished product (from finished product) in 1992
- establishment of the joint marketing board Asosiasi Industri Permebelan dan Kerajinan Indonesia (ASMINDO), an approved exporters system and an export quota system for *lampit*, by a Ministry of Trade decree.

These measures were ostensibly aimed at protecting the resource and encouraging the domestic processing industry. The ban on the export of unprocessed and semiprocessed rattan artificially reduced the demand for raw material, causing prices to drop, which acted as a subsidy for domestic processors. In this respect the policy was successful; the rattan processing industry in Indonesia has grown substantially. However, the depressing effect on raw material prices came at great cost to the people involved in raw material cultivation and extraction. The reclassification of rattan webbing as a semifinished product further reduced demand for cultivated rattan species used for this product.

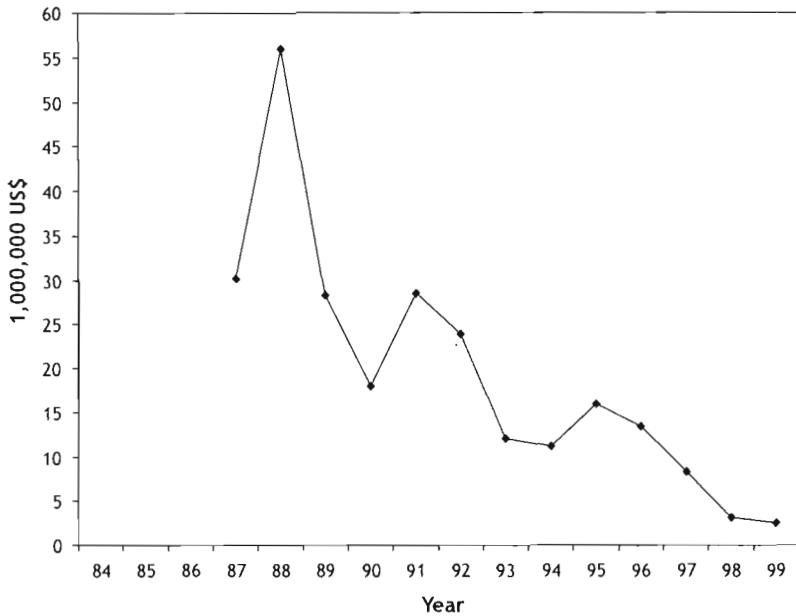
One of the most important changes for the rattan growers of Kalimantan was the establishment of ASMINDO, ostensibly to 'prevent unhealthy competition' among *lampit* exporters, following the same approach used by Asosiasi Panel Kayu Indonesia (APKINDO) to control the plywood industry (Barr 1998). Indeed, both associations were effectively controlled by the same person. ASMINDO imposed export restrictions on its membership in order to manage supply, in an effort to control quality and to increase unit prices. This strategy was based on the reasoning that, as the main supplier of *lampit*, Indonesia could control the market. Individual manufacturers reported that the quota was assigned based on political connections and payments.

**Figure 2.** Rattan lampit industry in Amuntai, South Kalimantan, 1984-2000



Source: Indonesia Central Bureau of Statistics.

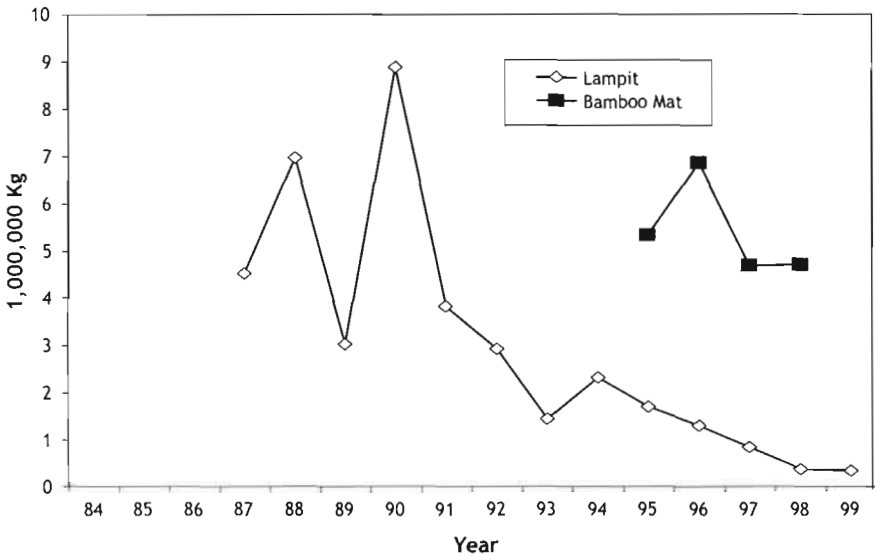
**Figure 3.** Lampit exports, 1984-1999 (US\$, free on board)



Source: Indonesia Central Bureau of Statistics.

These measures led to severe reductions in manufacture and export of *lampit* (see Figure 4). There were also big fluctuations in value-added, as the unit price changed (in nominal terms) from US\$6.38 in 1987 to as low as US\$1.22 in 1990 and back up to US\$8.39 in 1995. The number of enterprises had dropped to 20, and now, according to anecdotal evidence, the industry is almost completely destroyed, with only one *lampit* factory and a number of home-based manufacturers producing for the domestic market. ASMINDO officials lay the blame for this situation on changing tastes and decreased demand in the main importing country, Japan. In fact, Chinese manufacturers developed a bamboo based substitute for rattan *lampit*. This product was exported to Japan beginning in the early 1980s, but exports expanded dramatically to fill the gap created when the Indonesian prices increased and quantities decreased (see Figure 4).

**Figure 4.** Lampit exports from Indonesia and bamboo mats sales from China to Japan, 1984-1999 (kg net weight)



Sources:

Indonesia Central Bureau of Statistics.

Yearly Book of China Customs.

The drastic reduction in output has likewise reduced demand, and prices, for raw material. Raw material prices have changed little in nominal terms since 1987, and have decreased in real terms. Researchers in other rattan farming areas in Kalimantan report similar, though more pronounced, trends. In more remote areas, with higher transport and other transactions costs, there have been no buyers for several years.

The price slump following the introduction of restrictions on exports was a hard blow to all rattan farmers. Most farmers were unaware of the reasons for the price slump. They had already experienced ups and downs in prices of rattan, so they were waiting for the good times to come back. As the situation did not improve over time, more and more farmers have begun to seek alternative sources of cash income. Villages with better access to alternative opportunities started to set themselves apart from the dominant rattan based model. These villages were mainly located in the eastern part of our survey area in Kutai and in Pasir as a whole. The biggest change in activities occurred in Pasir along the trans-Kalimantan road, where numerous immigrants from South Kalimantan started panning for gold on a large scale with motorised equipment. Though not directly linked to the slump in rattan prices, the development of gold panning, with very high returns to labour, quickly changed opportunity costs.

### **Oil palm plantations and pulp plantations**

Another major change that has affected rattan growers is the rapid expansion of oil palm plantations in the province. These plantations typically cover several thousand hectares, often in rattan growing areas. In many cases there is direct competition for land, with oil palm concessions given on land that has been used and managed by indigenous people for swidden agriculture, including rattan gardens. In the village Modang the establishment of a large oil palm plantation in the early 1980s resulted in many people being displaced and large areas of productive rattan gardens being destroyed. More recent attempts to establish oil palm plantations have led to bitter, sometimes armed, conflict between villagers and company employees. For example, a severe conflict between the company P.T. London Sumatra and Lempunah villagers involved malicious destruction of rattan gardens and forest on the one side, and burning of vehicles and buildings and uprooting of newly planted oil palm plants on the other (C. Gönner personal communication).

But oil palm plantations also have a 'pull effect'. Oil palm growing is seen as an interesting new opportunity by local people who appreciate benefits such as regular cash income (oil palm fruits can be harvested every week), guaranteed market, and a more 'modern' lifestyle. Indeed, the main reasons for people's resistance seem to be the lack of adequate compensation for land they consider to belong to them and the wish to maintain a broad portfolio of economic activities. People do not want to limit their options. The oil palm companies, in contrast, want to encourage (or force) people to concentrate their efforts on oil palm growing, partly to ensure more efficient production and sufficient raw material to run their processing factories at capacity and partly, no doubt, to foster a dependence among growers. These issues notwithstanding, there is a strong desire among people in the area to get involved in oil palm growing.

The other big land use change has been large-scale planting of pulp plantations (HTI), oftentimes on 'degraded lands'. Under the Indonesian government's definition of degraded lands, the term applies to rattan gardens, which are seen as degraded forests. Indeed, our spatial analysis showed a strong correlation of rattan growing areas with HTI.

## The fires of 1997

Another major impact on rattan gardens was the fires of 1997. During a period of prolonged drought associated with an *el niño* event, several million hectares of Kalimantan were burned by wildfires. The hardest hit areas were logged over forests and areas of new oil palm and HTI plantation establishment, which often coincide. In many places, fire was used as a weapon in land conflicts. For example, in the aforementioned village of Lempunah large areas of rattan gardens were burned (C. Gönner personal communication).

The fires did not affect all the villages of the area with the same intensity. The easternmost villages of Kutai and all of Pasir were the hardest hit. As these villages were also the ones with the best access to other opportunities, the trend towards change was reinforced.

In some villages, fires destroyed up to 90% of the rattan gardens. Beyond the physical damage, this event had a traumatic effect on local people. Rattan gardens had been seen as a source of security. While prices might fluctuate, the rattan could always be sold for cash when needed. The rattan kept growing, and in many ways people used their rattan gardens like a savings account. Many respondents use the analogy themselves, saying that a rattan garden is like having money in the bank. All of a sudden, with the widespread burning of rattan gardens, the sense of security was replaced by the recognition that rattan gardens too are vulnerable. This new reality, combined with the low prevailing prices, had a determining effect in many villages to abandon rattan cultivation.

In other areas the response was different. In the west part of Kutai some villages were spared the fires, while others were as severely hit as Pasir villages. People from villages in both categories seem to retain a high interest in rattan growing. Some have decided to convert from *sega* cultivation to *pulut merah* cultivation. This small-diameter species is relatively fast growing (compared to *sega*) and current prices are high. Farmers are able to harvest quicker, reducing the risk of total loss by fire. Furthermore *pulut merah* thrives in wetter areas along rivers, which are less prone to fires. The shift to this new species is so popular that *pulut merah* seeds are in high demand all over the area.

Other villages, especially those dominated by Benuaq and Bentian ethnic groups, still maintain their interest in rattan gardens, even after the price slump and the destructive fires. They still hope that prices will soar again. But this may be due to their limited choice. In these remote villages the only source of cash is rattan. No other commodity is traded in the area. They need to sell rattan, even at very low prices, if they are lucky enough to have a buyer. But they no longer invest in establishing large rattan gardens. They cut only small amounts on a regular basis in order to meet their basic subsistence needs. In villages closer to the primary forest, farmers look for wild rattans (*Calamus manan*, *Calamus scipionum*) still in higher demand by traders for the furniture industry. Provided that there are traders willing to buy timber, illegal logging is a favourite occupation for local people in need of cash all over the area.

## **Krismon**

Another important factor came into play with the monetary crisis, or *krismon* (from *krisis moneter*), associated with the Asian financial collapse. With the massive devaluation of the local currency the relative value of export commodities soared. In Indonesia agricultural commodities—such as coffee, cocoa, pepper, rubber and palm oil—and mineral resources from oil to coal and gold appreciated in value, as did any labour-intensive industry. In our study area the impact was seen in Pasir with the rise of gold panning operations and in a trend towards increased coffee growing. There was also a short-lived boom in the rattan furniture industry, but the raw material demands did not result in much price increase for the small diameter canes grown in the study area.

## **TRENDS AND ISSUES—DEVELOPMENT AND CONSERVATION LESSONS**

### **The occurrence of an intermediate management system**

The rattan gardens of Kalimantan provide an excellent example of an intermediate management system for forest products. Tracing their development is difficult, as the historical records are sparse, but the evidence fits together well. Essentially, the rattan cultivation system was developed to fit with the traditional *ladang* (swidden) system. It offers the advantage of low cost establishment and maintenance with relatively high yields. The traditional system is highly diversified, and the rattan element fits well. Harvesting is highly flexible—the rattan continues to grow for years, so there is no penalty for delaying harvesting to coincide with labour availability or higher prices. Many villagers mentioned that it functions like a bank account, in that rattan can be harvested to respond to urgent needs for cash—to respond to medical emergencies, for example, or for ceremonial requirements.

### **The resilience of the rattan cultivation system**

It is important to know whether such an intermediate management system is robust if we are going to recommend and support such systems. This case is interesting because it has been ‘stressed’ by several factors, including the low prices, in this case driven by the policy environment; fires and competing land uses leading to reduced rattan garden area; and the occurrence of new, financially superior alternative opportunities for land use (oil palm) and labour (wage jobs, gold panning).

In fact, the rattan gardens in East Kalimantan tend to be resilient, especially in areas where there are limited other opportunities. While this may seem obvious, there are some important lessons in the reasons for their resilience. These systems:

- Offer a valuable risk management tool in which the rattan is available as long-lived, low-maintenance source of savings or income. This is especially important in systems without other, well-developed risk management institutions (not everybody has a bank account, let alone insurance policies)

- Play an important 'marker' function for property 'ownership'. Within the traditional system, rattan gardens are respected as a sign of occupation. Under the present circumstances, with large-scale state-sanctioned land appropriation by oil palm, HTI and mining companies, rattan gardens have been used successfully to demonstrate ownership and claim financial compensation from the company (however meagre)
- Provide a source of cash income in areas where there are few other opportunities to earn cash
- Provide other valuable forest products and services as the rattan gardens function as secondary forests, giving habitat for medicinal plants, ritual plants, and plants and animals valued for food
- Retain important cultural values. Rattan gardens, many of which have been inherited from fathers and grandfathers, represent important traditions and provide links to ancestors
- Live long, with little input required. Thus they have a high degree of inertia.

### Reasons to support the system

The question arises as to whether this system should be subsidised or otherwise supported, and if so, how? Clearly, as discussed above, rattan gardens are very important to a significant number of people and form an integral part of their livelihood systems. The stresses placed on the system have been, for the most part, generated from outside. Rattan trade policies have been designed to keep raw material prices low. Large-scale plantation agriculture has been pursued at the expense of people already living in the area. And the fires were largely human induced, many deliberately targeted to rattan gardens, even if they were facilitated by a natural period of drought. On this count, it seems that the system could be economically competitive if provided with a level playing field.

There are other benefits to be considered. The rattan garden system offers important ecological benefits in terms of biodiversity, forest cover, carbon sink and climate. Essentially, the financial value of rattan makes a long fallow period feasible. During the long fallow, the forest can regenerate and increasingly provide these ecological services.

From a national perspective, the strongest argument for removing barriers, and even for actively supporting the rattan cultivation system, is that it supplies a valuable export industry.

### Policy measures needed

There are several policy options that could be pursued simultaneously. Simple measures include reducing trade barriers that depress domestic raw material prices (including internal barriers, such as the ubiquitous illegal fees charged to traders, and official export taxes). Industry has resisted this, fearing that higher raw material prices would threaten its competitiveness. Additional measures then would be needed to assist industry to become more competitive. This could be achieved through more efficient raw material production (through



research and extension to improve the cultivation system) and trade (especially through improved market information) and through improved design, quality, efficiency and marketing of manufactured products. Combined with these measures, there is a strong case in favour of more careful land use planning to ensure that important rattan growing areas are not displaced by industrial estate crops.

### The future of the system

Under the current conditions of low demand and prices rattan gardens are a marginal activity in financial terms. New roads in the region, industrial plantations, mining and other new economic activities have displaced existing rattan gardens (push factors) and offered alternatives which attracted some rattan farmers to new activities (pull factors). However, rattan gardens remain important where competition for land is low because they fit well with the swidden cultivation system that is the economic mainstay in the region, because they have low establishment and maintenance costs, because they provide a mark of land 'ownership' and because they still serve an important purpose in economic risk management as a source of 'savings'. Moreover, rattan gardens provide valuable ecological services, in terms of biodiversity conservation and other forest functions. As rattan remains an important commodity in Indonesia and internationally, and as the current farm gate price for rattan appears to be artificially low—in large part because of the prevailing policy environment—the rattan garden system may remain viable, at least in the medium term.

Under the current circumstances, the young people interviewed in our surveys place their hopes on plantation crops. They acknowledge that their low level of education and know-how prevents them from being hired as salaried workers by large companies and even from migrating. Condemned to stay in the village, they long for the regular incomes from plantation crops: oil palm or rubber. Rattan is seen as a thing from the past, something rather backwards, inherited from their forefathers. But such negative perception may easily be overridden if prices go up and if returns to labour become favourable again.

### ENDNOTES

1. Derived from Belcher, B., Levang, P., García Fernández, C., Dewi, S., Achdiawan, R., Tarigan, J., Riva, W.F., Kurniawan, I., Sitorus, S. and Mustikasari, R. (2000) Rattan (*Calamus* spp.) gardens of Kalimantan: Resilience and evolution in a managed non-timber forest product system. FPP team paper presented at Lofoten workshop, June 2000, Lofoten, Norway.
2. Center for Social Forestry, Universitas Mulawarman, Gd. Pasca Sarjana Magister Kehutanan-Kampus Gn. Kelua, Jl. Ki Hajar Deantara 7 Samarinda, Kalimantan Timur 75123, Indonesia. E-mail: csf@samarinda.org
3. Center for International Forestry Research, P.O. Box 6596, JKPWB Jakarta 10065, Indonesia. E-mail: cifor@cgiar.org
4. Exchange rate 1984: US\$1 = Rp1,136; exchange rate 1987: US\$1 = Rp1,648.

## REFERENCES

- Barr, C.M. 1998 Bob Hasan, the rise of APKINDO, and the shifting dynamics of control in Indonesia's timber sector. Cornell University, Ithaca, New York.
- Belcher, B.M. 1997 Commercialization of forest products as a tool for sustainable development: lesson from the Asian rattan sector. Ph.D. Thesis, University of Minnesota.
- Boen, P.M., Hendro, P. and Satria, A. 1996 Study on the socio-economic aspects of the rattan production to consumption system in Indonesia: a case study in Kalimantan. Draft Report.
- de Jong, W., Rohadi, D., Belcher, B., Mustikasari, R. and Levang, P. 2003 The political ecology of forest products in Indonesia: a history of changing adversaries. *In*: Tuck-Po, L., de Jong, W. and Abe, K. (eds.) The political ecology of forests in Southeast Asia. Kyoto University Press.
- Eghenter, C. and Sellato, B. 1999 Kebudayaan dan pelestarian alam: penelitian interdisipliner di pedalaman Kalimantan. WWF Indonesia, Jakarta.
- Feaw, T.C. 1992 The history of rattan cultivation. *Malayan Forest Record* 35: 51-55.
- Fried, S.T. and Mustofa, A.S. 1992 Social and economic aspects of rattan production, middle Mahakam region: a preliminary survey. *GFG Report* 21: 63-72.
- García-Fernández, C. 2001 Sistemas tradicionales de gestión del bosque tropical en Indonesia: ecología y prácticas silviculturales. Universidad Complutense de Madrid, Spain. 215p.
- Godoy, R.A. 1990 The economics of traditional rattan cultivation. *Agroforestry System* 12: 163-172.
- Haury, D. and Saragih, B. 1996 Processing and marketing rattan. Ministry of Forestry in co-operation with Deutsche Gesellschaft für Technische Zusammenarbeit. SFMP Document No. 6a.
- Haury, D. and Saragih, B. 1997 Low rattan farmgate prices in East Kalimantan: causes and implications. Ministry of Forestry in co-operation with Deutsche Gesellschaft für Technische Zusammenarbeit. SFMP Document No. 12.
- Mayer, J. 1989 Rattan cultivation, family economy and land use: a case from Pasir, East Kalimantan. *German Forestry Group Report* 13: 39-53.
- Peluso, N.L. 1992 The rattan trade in East Kalimantan, Indonesia. *In*: Nepstad, D.C. and Scharzman S. (eds.) Non timber products from tropical forest: evaluation of a conservation and development strategy. Volume 9: advances in economic botany, 115-127. The New York Botanical Garden, Bronx, New York.
- Van Tuil, J.H. 1929. Handel en cultuur van rotan in de zuideren oosterafdeeling van Borneo (Trade and cultivation of rattan in the southern and eastern divisions of Borneo). *Tectona* 22: 695-717.
- Weinstock, J.A. 1983 Rattan: ecological balance in a Borneo rainforest swidden. *Economic Botany* 37(1): 58-68.