

MANAGING RATTAN HARVESTING FOR LOCAL LIVELIHOODS AND FOREST CONSERVATION IN KERINCI-SEBLAT NATIONAL PARK, SUMATRA

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ABSTRACT. Tropical forests are rapidly vanishing throughout Southeast Asia as a consequence of conversion to agricultural use and commercial timber harvesting. In Kerinci-Seblat National Park (KSNP) in Sumatra, Indonesia, a lack of access to irrigated ricefields, insufficient yields from degraded hillside farms, and limited wage labor opportunities leave many households with few livelihood sources other than to collect rattan or convert forests to farms within the park. In this paper, we focus on the management potential of one species of rattan, *Calamus exilis*, a small-diameter, coppicing cane used in local handicrafts and basketry centered in the village of Sungai Tutung, and collected illegally in KSNP. Our studies suggest that *C. exilis* may be suited to sustained-yield harvesting at four year intervals, and to management of rattan harvesting in designated extractive zones in KSNP. While managed harvesting of *C. exilis* will not solve the problem of forest conversion in KSNP, it represents one potential component within an integrated approach to forest conservation that builds upon the specific mix and interdependence of livelihood activities within one community. However, sustained-yield harvesting of *C. exilis* will require significant modifications in government policies, property rights and local management institutions.

INTRODUCTION

Many tropical governments and aid donors regard the development of extractive non-timber forest products (NTFPs) as a means to forest conservation. This strategy assumes that by increasing the value of natural forests as a productive asset superior to alternative uses, people whose livelihood is dependent on forests will be encouraged to manage them in a more sustainable fashion. Moreover, it presumes that for a forest to persist, it must have locally-recognized value, be it economic (utilitarian) or cultural (i.e., sacred) value; and that in the absence of local value, forests will continue to be converted (Alper 1993). Harvesting or extracting naturally occurring NTFPs is part of a broader strategy or new paradigm known as "integrated conservation and development programs" (ICDPs). ICDPs seek to protect natural areas through developing sustainable economic alternatives to habitat destruction and to integrate them with conservation efforts in areas where substantial biodiversity still remains (Goodland 1987, Shaffer & Satterson 1987).

A lively debate has ensued since the publication of Peters *et al.* 1989 article in *Nature* as to

whether the exploitation of non-wood forest resources is actually a viable and profitable means for integrating the use and conservation of tropical forests (Richards 1993, Browder 1992), and whether even moderate human use of such environments modify them sufficiently to lead to biotic impoverishment (Nepstad *et al.* 1991). Salafsky *et al.* (1993) do a particularly good job of identifying the ecological, socioeconomic and political constraints to extractive reserves generally, and importantly, how these constraints vary from place to place. Among the important lessons are the realizations that most NTFP collectors are also farmers and prefer to remain predominantly farmers (Richards 1993), and that harvesting of NTFPs has always supplemented rather than replaced agriculturally-based livelihoods (Siebert & Belsky 1985, Belsky 1992). One of the thorniest issues facing the management of harvesting NTFPs for forest conservation is the complexity of defining and enforcing who has, or should have, rights to particular land, trees, plants and their products. The unwillingness of states to recognize and support customary resource tenure and community management institutions has led to the breakdown of local tenure and management systems (Jessup and Peluso 1986, McCay and Acheson 1987, Feeny *et al.* 1990, Berkes 1989, Poffenberger 1990). These concerns are complicated further when harvesting of NTFPs occurs in protected areas, such as national parks (Brechin & West 1991).

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Rather than dismissing the promise of NTFP harvesting, or more generally, NTFP-based natural forest management, the above researchers argue for pursuing the strategy given that a pure preservationist approach is not viable in many regions of the world. They suggest that the promise of NTFPs (and ICDPs as well) be treated as a hypothesis to be proven in particular situations, and efforts to improve the integrated conservation and development model be strengthened so these projects can accomplish their stated goals (Kremen *et al.* 1994). Among the factors to be "strengthened" are efforts to resolve underlying political and land rights issues. Furthermore, even should conflicts over access be resolved, there still remains the pressing questions of how collection of NTFPs shall be managed on a sustained-yield basis, and oriented to benefit those communities or particular peoples whose economic interests are to be tied to biodiversity conservation.

In this paper we focus on the opportunities and constraints to sustained-yield harvesting of one rattan species, *Calamus exilis*, as one component of a broad-based effort to reduce agricultural conversion in Kerinci-Seblat National Park (KSNP), one of Indonesia's premier protected areas. Rattan is an attractive candidate for meeting the goals of ICDPs due to its widespread abundance in primary forests, wide range of traditional uses, commodity value, and importance to landless households who engage in agricultural conversion because of limited alternative economic opportunities (Siebert & Belsky 1985, Peluso 1992a, Townson 1994). However, whether managed harvesting of *C. exilis* can be permitted and sustained in KSNP depends on whether the Indonesian state will grant Kerinci peoples legal rights to collect *C. exilis*, and if an equitable and effective institutional base can be established (that is, who shall be granted collection rights). These are complicated issues given that forest areas in KSNP have been regarded as open access resources, and agricultural conversion (especially to permanent cash crops) has become a very lucrative activity.

METHODS AND STUDY SITE

The study was conducted in the Kerinci district of Central Sumatra (Indonesia) during one year of fieldwork (1987–1988), and subsequent visits in 1990, 1991 and 1992. Data were collected using both qualitative and quantitative methods. In-depth interviews were conducted with rattan collectors from the village of Sungai Kuning (located 20 km within KSNP) and rattan handicraft producers from the village of Sungai Tutung (located within the central Kerinci val-

ley) (see Figure 1.). Key informants were queried on their respective socioeconomic assets, livelihood strategies, and rattan-based activities. Interviews were also held with KSNP park director, forest guards and officials from the Indonesian Departments of Forestry and Agriculture on park policy and laws. Demographic characteristics of *C. exilis* and the potential for sustained-yield harvesting of wild populations were assessed by sampling plant and cane abundance in forty 0.05-ha plots (each 20 × 25 m) selected at random intervals along transects (total of 2 ha sampled). In each plot the number of rattan plants, the number of canes per plant, and the length of all harvestable canes were recorded. Cane resprouting and growth rates were assessed in a subsample of 50 *C. exilis* plants selected at random from the sample plots. Each sample plant was permanently tagged, the number and length of canes determined, and all canes greater than 2 m length removed in January 1990. Cane resprout and growth rates were remeasured 30 months later, in June 1992. The value of rattan was calculated using 1990 prices paid to collectors upon delivery of clean, air-dried cane to village artisans¹.

Kerinci-Seblat National Park (KSNP), located in west central Sumatra, is internationally recognized for its much diverse habitats, which range from lowland forests and wetlands to unique montane plant communities. KSNP provides critical habitat for many rare and endangered species including the Sumatran rhino, Sumatran tiger, Asian elephant, clouded leopard, serow, and tapir. It is also an important water catchment area for the two largest rivers in South Sumatra (i.e., the Musi and the Batang Hari). Because of its rich biodiversity and watershed importance, it was proposed as a national park in 1982, though as of yet it has no legal status as a national park (Republic of Indonesia 1993). At that time, 1.48 million ha were to be designated a national park. However, about one-third of that area has already been lost to forest concessions and agriculture in the period 1985–89. Activities outside the park including mining, transmigration, and irrigation schemes also adversely affect natural habitats in the park (Republic of Indonesia 1993).

Forest Management and Control in Kerinci-Seblat National Park (KSNP)

Despite its geographical isolation, the central Kerinci valley has been inhabited since prehistoric times by people migrating from West Sumatra, Jambi, Java, and Malaysia (Watson 1984). This 10 m long and 80 m wide rift valley is situated in the center of KSNP and at the 1990 census contained a total population of almost 300,000 increasing at an annual (region-wide)

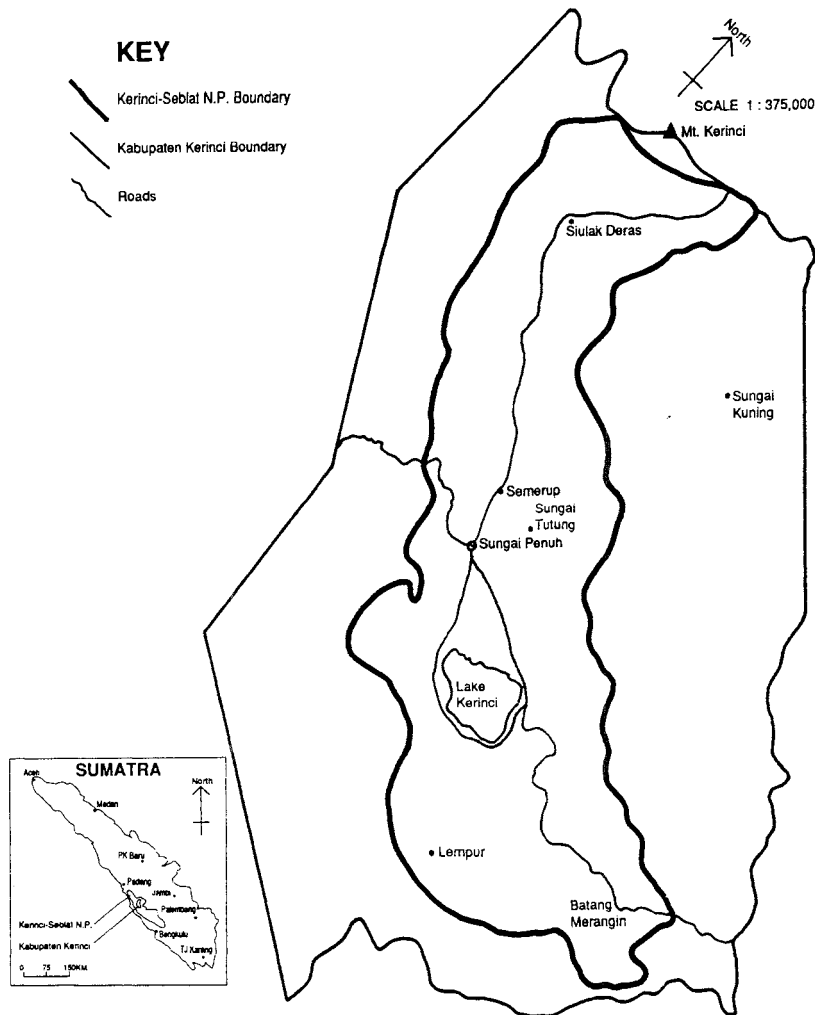


FIGURE 1. Map of Kerinci, Sumatra.

rate of 2.2% (Kantor Statistik Kabupaten Kerinci 1990).²

As a Dutch colony, the forests (or *Boschwesien*) in Kerinci were protected as watersheds and these declarations were continued by the post-colonial independent Indonesian Government (i.e., in the Basic Agrarian Law of 1960 and the Basic Forestry Law of 1967). In the name of national interest, the government of Indonesia has changed the boundaries of KSNP to enable logging concessions and development schemes, and the revisions have effectively excised most forests below 1000 meters and virtually all primary forests below 300 meters (Barber 1994). These lowland forests are the most biologically diverse, and the most threatened and unprotected in Sumatra.

Despite the fact that Indonesian law prohibits both forest farming and forest product collecting in national parks, these activities persist in KSNP. Both large and small cultivators are engaged in agricultural conversion in KSNP. Some maintain permanent homes in the central Kerinci valley, while others live in communities permanently located within the park. Of particular concern for forest conservation is the cultivation of perennial cash crops—cinnamon (*Cinnamomum burmannii*) and coffee (*Coffea canephora*). Unlike integral or traditional shifting cultivation systems which entail a temporary (1–3 year) shift in landuse followed by a long (15–20 year) fallow period, the production of these perennial crops lasts for 10–20 years with no fallow period, and

involves clean-weeding (at least during the early stages). These practices inhibit forest regeneration.

Government-supported transmigration settlements south of the park have expanded the conversion zone as well. The number of households living in the park as of 1991 was estimated to be 15,709, of which 11,442 households are in Jambi Province (Republic of Indonesia 1993). The Government of Indonesia considers all of them to be "encroachers" and has organized resettlement programs as a means of dealing with the problem. However, resettlement efforts have been expensive and ineffective. There is no proof whether resettlement efforts identified and moved the people causing the most damage to the forest, many "resettled" families returned to KSNP after subsidies stopped and to harvest crops, and the substantial costs involved in resettlement diverted management attention and financial resources from funding activities to achieve forest protection through ICDPs. Lastly, to the extent that resettlement was involuntary, it also created bitterness among local populations and eroded local support of park management goals and strategies in general.

Kerinci cultivators contest their representation as "encroachers". They insist that they have legitimate claims to farm and/or harvest Kerinci's vast forests. Kerinci farmers believe they are entitled to farm land anywhere in the Kerinci forests (*alam Kerinci*), that is, if the land has not been cleared and claimed by someone else. To establish a claim, the prospective farmer places a marker or flag on the newly cleared parcel.

The issue of how customary law or *adat* in Kerinci governs access to forests deep within the park or on its edges is difficult to ascertain. What has been written on *adat* in Kerinci thus far has centered on property and inheritance of irrigated riceland; little has focussed on describing *adat* as it applies to forests and to forest products in particular (Watson 1981). Some recent work undertaken by the Republic of Indonesia on tenure issues in Kerinci concluded the following:

Adat rights [i.e., in Kerinci] were a combination of specified private rights and common rights held by the village . . . Land tenure and property rights are well known and well respected in some areas and less so in others. A distinction can be made between stable, slow growing homogenous communities with generally well established land tenure and property rights (e.g. Pesisir Selatan and Solok) and unstable areas . . . These are mainly areas with recently improved access and areas that are regarded as open-access resource area, open to be used or converted. In general, forest areas under concession (HPH) and Park areas are regarded as open access resource (Republic of Indonesia 1993a:4-5).

Our studies suggest that forest farming and forest product collecting have increasingly moved further into the forest as commercial logging and agricultural conversion has eliminated the more accessible forests. From our conversations and interviews with villagers and rattan collectors, remote forest areas have always been viewed as open access resources, and there have been no particular regulations, community-based or otherwise, governing their use. One implication of this tenure situation is that there are not indigenous community management institutions upon which to base future forest product collecting (or farming) practices.³

Livelihood Strategies of the Landless: The Role of Rattan

Agricultural conversion in the eastern and central sectors of KSNP (i.e., where we focussed our studies) is largely the work of young, landless households from three villages in the central valley: Semurup, Siulak Deras and Sungai Tutung.⁴ By "landless," we refer to people who have no access (legal or otherwise, as either owners or sharetenants) to **productive** agricultural land, either on the slopes or in the rice fields of Central Kerinci. Households who lack access to irrigated rice production turn to dryland farming for the majority of their food and income, and when possible, to seasonal on and off-farm employment (Belsky 1991). As a result of land degradation, many hillside farming areas within the central Kerinci valley are unproductive or unprofitable. Efforts to rehabilitate or "regreen" degraded sites with bench terraces and/or agroforestry practices are fraught with difficulties, including highly site- and class-specific requirements (Siebert & Belsky 1989, Belsky 1993). At present, forest conversion within KSNP is a logical response among villagers lacking access to productive land and food security in the absence of economic alternatives.

An alternative income source utilized by residents of Sungai Tutung (one of the villages identified as responsible for forest conversion) is the sale of wild rattan and rattan baskets and handicrafts. Rattan has been collected from the forests and used in binding, weaving and basketry for many generations in Kerinci. However, commercial exploitation of large diameter rattan (*C. manan*) has ceased now completely in Kerinci (Siebert 1989). This is not because Indonesian institutions or laws have changed, but rather because all export-quality canes have already been collected. *C. manan* are now found only as immature plants in isolated sites and fruiting plants have not been observed since the early 1970s.

While artisans prefer using the strong *C. manan* for making basket frames, they have switched to using inferior substitutes such as the rattan (*Korthalsia rigida*) and wood (*Toona sureni*). Today the majority of rattan market demand is for *C. exilis* whose small, white canes are split and used in basket weaving and handicrafts.

C. exilis is gathered and sold primarily to traditional artisans in the village of Sungai Tutung. This single village provides the entire Kerinci valley with its rattan basket needs. Sungai Tutung rattan artisans produce two kinds of products: handicrafts and traditional baskets (*jangke* and *ambon*). Market demand for rattan handicrafts has increased in the last twenty-five years and now includes such products as cassette holders, bird cages, flower vases, lampshades, and tourist trinkets which are contracted by traders from other areas in Sumatra, as well as Jakarta.

Limited access to riceland and productive uplands is a major factor accounting for the concentration of rattan enterprises in Sungai Tutung. Soils surrounding Sungai Tutung are visibly eroded and farms have been abandoned. Approximately two-thirds of Sungai Tutung households lack access to ricelands (either as owner or tenant). Instead, many sell rattan products as their primary source of income. Importantly, many of these households are headed by women who report that they prefer rattan-based enterprises to forest farming because it can be more easily combined with domestic responsibilities. While rattan basketry and handicrafts provides income for these landless people, it provides a supplementary source of income for the remaining households. These households cite farming as their major source of income, but that they also sell rattan products during the interim before dryland crops mature, or when prices for their farm commodities decline.

Rattan Collection and Handicraft Production: Two Case Studies

In this section, two case studies are presented to illustrate the role rattan plays among households who are landless, or unable to meet household needs through farming. The case studies also provide important insights into how decisions are made to open a new forest farm plot or to continue extracting rattan—both illegal acts with strong risk of government retaliation. The first case involves a young rattan collector named “Tarnil” and the second an older female rattan handicraft producer named “Ibu Kutri.” Both names are fictitious, but describe people from the village Sungai Tutung.

Tarnil is a 36 year old man, originally from Sungai Tutung. When we first met Tarnil in 1987

he and his family were living in a temporary work hut (*pondok kerja*) he had constructed on farmland cleared from primary forest 20 km within KSNP, near the (illegal) settlement of Sungai Kuning (see Figure 1). After his marriage in 1984, Tarnil began a cinnamon and coffee farm. Unable to secure productive land near Sungai Tutung, he said he had no option but to turn to the forest. He chose the area near Sungai Kuning (located 10 hours by foot from the main Kerinci valley) because the soils and slopes were well suited to growing cinnamon and coffee, and because of the proximity to other people. Like others before him, Tarnil regretted leaving his relatives, the services and the lively village life in the Kerinci central valley to live—even seasonally—in the forest. After clearing the land, Tarnil planted coffee and cinnamon which would begin producing after about 4 years and 8 years respectively. In the interim period, Tarnil continued to collect rattan which he sold to rattan artisans in Sungai Tutung.

Rattan collecting is considered very demanding work, as it necessitates many hours of hiking through dense forest and uncomfortable encounters with rattan thorns, leeches, and bees. Consequently, it is work that is mostly undertaken by young males. As Tarnil notes,

“If people do not have to collect rattan, they would not. I do it because I have to. In the past I had no other income. And now I do it because my *kebun* is not yet producing anything.”

Tarnil gathers rattan because it is not seasonally-dependent (though it is more difficult during the rains), and because it is more profitable than the limited wage-labor opportunities that are available (about 50% more for one days labor). According to Tarnil and other rattan collectors, anybody may collect rattan (i.e., there are no reserved areas nor customary access rights regarding the collection of wild plants in Kerinci).

Rattan collecting became particularly critical to Tarnil’s household economy in the early 1990s when coffee prices declined precipitously. In fact, coffee prices were so low that Tarnil and others concluded that it was not worth their labor and transportation costs to harvest beyond what they would use for their own household consumption.

The second case study centers on *Ibu Kutri*. *Ibu Kutri* is a widowed woman in her late 40s who lives with her children and disabled mother in the village of Sungai Tutung. As a single, female-headed household, Kutri provides income for her family through a variety of means. As a last resort, Kutri accepts seasonal wage labor work in the ricefields. She has purchased a small (approximately 1 ha) dryland farm in Batang Merangin—a site in South Kerinci reached by a one

hour bus ride. She reports that this was the only land she could acquire (i.e., she lacks the labor to open new forest land herself). But even this land is only marginally productive. She reports that:

“Soil in the region is exhausted, already dry. If you want to have a dryland farm (*kebun*), you must go to the forest. But how can I do that? People in Sungai Tutung must buy everything. What is best is a mixture of rattan (artisan work) and a *kebun*. There are no options to acquire irrigated rice padi (*sawah*).”

In 1987, Ibu Kutri was supporting her household primarily by weaving rattan baskets for sale in the nearby Sungai Penuh market. Constructing rattan baskets has been a tradition in her family. Ibu Kutri explained that she prefers rattan work to all other jobs since it can be performed at home, can be stopped and started intermittently and thus is easily coupled with other domestic duties, and is less strenuous and more economically profitable than agricultural labor.

Ibu Kutri purchases rattan from rattan collectors such as Tarnil. In fact, in 1992 Tarnil sold his farm and began serving as a middleman and hiring other young men from Sungai Kuning to collect and clean rattan (i.e., remove the silica sheath, cut the canes into 2 m lengths (*potong*), bundle and tie). Tarnil then hires others to transport the cane to Sungai Tutung.

The future of Ibu Kutri's rattan work is threatened as a result of the ban on forest extraction in KSNP, especially since late 1987 when enforcement efforts escalated. Since that time rattan collectors have been apprehended, fined, and/or jailed. The rattan itself is periodically confiscated since it is known to be illegally collected from the forest. (This is in contrast to forest crops such as cinnamon and coffee which it is impossible to determine whether they were legally grown in the valley or illegally in the park). To assure her supply, Kutri previously travelled by bus to Lempur where rattan used to be carried out of the park. She would purchase rattan from Lempur collectors and conceal the rattan in canvas bags and sneak it back to Sungai Tutung. Before 1987, she estimated that she purchased approximately 2000 canes every other week which would supply her and 20 other Sungai Tutung rattan artisans. She said that she could have purchased the rattan “above board” by paying the established Rp 10,000 bribe expected by the local police, but that this would significantly reduce its profitability. When the recent arrests began, however, she became more apprehensive and supplies dwindled due to reluctance by collectors to risk fines and imprisonment. She describes her predicament:

“The future for us looks very bad, especially for us without land. We must go to the forest. Rattan is essential. But rattan alone is insufficient to survive.”

Rattan: A Contested Symbol and Resource

Rattan has become a contested symbol and resource in Kerinci. On one hand, selling rattan canes and products provide important income for the landless poor, and rattan baskets are a basic and traditional piece of farm equipment in the region. The connection of Kerinci residents with rattan can also be seen in the preponderance of concrete planting structures throughout the regency molded in the shape of the *jangke* and *ambon* rattan baskets. On the other hand, rattan baskets have acquired national meaning as a symbol of Kabupaten Kerinci and are pictured on documents and signs describing the park. The appropriation of rattan and rattan baskets in park literature and government symbols masks the underlying struggles to eradicate the presence of and claims to KSNP forests and NTFPs by Kerinci inhabitants, and the resistance of the latter to this expropriation. Ironically, rattan baskets would cease to exist if current policies prohibiting rattan collection were effectively enforced.

This irony, however, is not apparent to GOI or park officials. When foreign guests and dignitaries visit Kerinci, local rattan artisans are requested to display their most elaborate rattan works. This was the case when the Governor of Jambi came to Kerinci to officiate at the “*Adat Alam Kerinci Seminar*”—the same seminar where the ban on all forest extractive activities including rattan collection was repeatedly asserted.

In 1987, Government officials from the Department of Forestry (*Dinas Kehutanan*) and the police visited Sungai Tutung and ordered rattan artisans to cease the production of rattan products. We learned about this encounter during an interview with Pak Muhamud, a member of a long-standing rattan artisan family and informal spokesperson for rattan artisans in Sungai Tutung. Muhamud protested this order not only because of its devastating economic implications, but because he considered the official ignorant about the ecological characteristics of rattan and its abundance: “They don't ever go to the forest, they don't know anything about the rattan plant.” Muhamud explained that their industry relies only on *C. exilis*, not the endangered *C. manan*, and that *C. exilis* is abundant and has many characteristics which suggest it can be sustainably harvested.

Other contradictions regarding rattan were evident as well, particularly during 1987–1988 as collection bans were enforced. As discussed

above, the Sungai Tutung rattan artisan trade continued despite its dependence on illegally collected rattan. In fact, the trade was being monitored and assisted by the local Government Department of Industry (*Departemen Perindustrian*) who conducted a formal survey of rattan artisans in Sungai Tutung in 1987. The purpose of the survey was to assess labor requirements and marketing difficulties encountered by small-scale rattan artisans in order for the department to help provide them with assistance, specifically the possibility of procuring cane processing (i.e., splitting) equipment. This survey also confirmed that many artisans relied upon rattan out of economic necessity, and given a choice, they would prefer to remain in rattan production rather than farm in the forest (especially female rattan artisans).

In 1988, the authors conducted a follow-up survey in Sungai Tutung and found that after the imposition of rattan prohibitions, the number of active rattan artisans had dropped from 77 to 20 due to the shortage of cane. When asked what they were doing to earn income, the almost universal reply we heard was: "We go to the forest to plant crops. What else can we do?"

Implications for Managed Rattan Harvesting of *C. exilis* in KSNP

Promotion of forest conservation in KSNP needs to move away from past emphasis on resettlement to a more integrated approach which builds on the multiplicity and interdependence of livelihood activities. Sustained-yield management of *C. exilis* collecting represents one potential component of such an integrated approach.

C. exilis is a forest product which possesses ecological and social characteristics which make it a potentially attractive candidate for locally-managed harvesting. *C. exilis* is abundant in natural and disturbed forests, is available year-round, and can be repeatedly harvested at approximately 4 year intervals. In addition, extraction of *C. exilis* does not appear to adversely affect the conservation of other flora and fauna because as a small slender cane, its harvest (i.e., when pulled from supporting vegetation) does not disturb other flora upon which it grows and because its fruits are small, extremely bitter, appear to be less numerous, and have never been observed by the authors or rattan collectors to be utilized as a food source by birds or mammals (Siebert 1995).

There is sufficient forest area in KSNP to support *C. exilis* harvesting at current cane con-

sumption levels using only a small proportion of protected forest. Based upon estimates of cane use reported by local artisans and cane harvesting by collectors, approximately 3,000,000 m of *C. exilis* canes were harvested from Kerinci forests in 1990. Given the abundance of *C. exilis* observed in principal rattan collecting areas and recorded cane resprout and growth rates following harvest, approximately 1500 ha of forest would be required each year to meet cane demand. If the cutting cycle was four years, approximately 6000 ha of forest would be required to support local rattan businesses at 1987 cane consumption levels on sustained-yield basis. This represents only 0.3% of KSNP's total land area (Siebert 1995). Management units (i.e. mini-watersheds) could potentially be demarcated in principal collecting areas, and extraction of *C. exilis* permitted once every four or so years.

Furthermore, demand for *C. exilis* is low and centered among rattan artisans within only one village— the village of Sungai Tutung. There is no other market demand for this particular rattan species in Kerinci. This is in contrast to the market demand of larger diameter canes which are used to produce furniture for export. Changes in international and/or domestic market demand for Sungai Tutung rattan products could increase demand for *C. exilis*, although this would require many changes in current marketing networks.

Given that rattan artisan production is centered in Sungai Tutung, members of this community can and should play a major role in managing *C. exilis* harvesting. These individuals already know most of the rattan collectors and their activities govern demand for *C. exilis*. They also have a high incentive to work with park planners to ensure a steady supply of rattan cane without risk of arrest or fine. Sungai Tutung rattan artisans are already loosely organized into a rattan producer association with a visible leader who has represented their interests to various government bodies. Perhaps members of this association, in cooperation with KSNP administrators and rattan collectors, could develop a more formal governing unit (or council) and cooperatively create guidelines for co-managing rattan collection, with consideration given to the ecological parameters noted above. Permitting rattan gathering and pursuing community-based or co-management strategies within KSNP are likely to heighten artisans and collectors' investment in reducing forest conversion by other Sungai Tutung residents and incipient forest farmers from other Kerinci communities.

While *C. exilis* harvesting appears possible, the question remains: can *C. exilis* harvesting be sustainably managed or would it become another

over-exploited, open-access resource; and furthermore, could it be managed in ways that promote equity? One such limiting factor is stipulating management rules for *C. exilis*, rather than for forest products as a category in general. While rights to trees, plants and their products have customarily been assigned and passed along according to ecological characteristics such as species (Peluso 1994), instituting policy at the species level has little precedent in Indonesia.

Despite the representation of forest communities as homogenous, stratification based on ethnicity, class, age and gender persist; and it affects forest conservation efforts. For example, traditional village elites gained access to better land and inputs in social forestry efforts on Java (Sunderlin 1991); and stratification based on gender has limited women's abilities to direct forest management objectives and program activities (Hoskins 1983; FAO 1987). A conflict of interests is likely in Kerinci where cinnamon and coffee farmers (who have benefitted greatly from forest conversion) would likely want to maintain forest farming opportunities over reserving forests for NTFP extraction and related-activities. On the other hand, the landless (especially women in female headed-households) would benefit from supporting NTFP reserves and rattan enterprises. The marginal position of rattan artisans and collecting households in general, and of women in these households in particular, will affect the role they can play in community-based or co-managed approaches to forest management in KSNP.

There are many socio-political constraints to the GOI granting rattan collection rights within Kerinci Seblat National Park and to moving toward developing community-based or co-management institutions, with either rattan collectors/artisans or particular local community leaders. Some of these problems pertain to Indonesia as a whole (Peluso 1992b), and others are more germane to the particularities of KSNP. For example, as noted above, forest-policy making in Indonesia is a relatively insular, top-down process where non-forestry government agencies, provincial-level forestry officials, non-governmental organizations, and the general public have a limited voice (Barber *et al.* 1994, Poffenberger 1990). Forest product collection in National Parks is currently illegal, and when such rights have been extended to wild rattan in production forests, they have always been subordinate to national and state interests, which usually means commercial production (Barber 1994). The tremendous profits available through logging, mineral prospecting, and commercial (plantation) agriculture in Indonesia's forests still overshadow

the gains from non-timber forest products, despite the sizeable national income derived from rattan.

In KSNP, the history of relations between park planners and local Kerinci residents has been one chiefly of coercion or neglect. Project staff in KSNP have not been trained to consider ICDPs, local participation or co-management in park planning; thus far their efforts have focussed on demarcating boundary lines and resettlement. "This has resulted in poor consultation with local communities on boundary placement and created substantial conflict with local communities, particularly those on the edges of the Kerinci valley" (Barber 1994:108). An earlier idea to establish extractive zones in KSNP was proposed, but due to limited staff, financial resources, and especially the lack of government support, KSNP managers did not implement this proposal.⁵

CONCLUSION

Despite current analyses which draw attention to the limitations of extractive NTFPs, managed rattan harvesting has a potential role to play in forest conservation and development efforts in KSNP. Since 1988, the Worldwide Fund for Nature has proposed the buffer zone concept and instituted pilot projects in Central Kerinci, though they have not reported much success thus far (Aumeeruddy 1992, Savoure 1991). More recently, the World Bank has supported surveys and exploratory studies to ascertain whether it will include Kerinci as an Integrated Conservation and Development Project (ICDP) as part of the Global Environmental Facility (GEF), but the prospects seem dim at present given the failure of Government officials to support GEF recommendations, particularly to address resource rights issues (Barber 1994).

To be effective, managed NTFP collecting must be approached within the broader context of villagers' multiple livelihood strategies, especially agriculture; and build on the particular characteristics of specific villages. Indeed, managed *C. exilis* harvesting as proposed here may be relevant mostly to the village of Sungai Tutung. Other villages (especially Semurup and Siulak Deras) where many young, landless households utilize KSNP for agricultural land, will need to develop other economic alternatives based on their specific mix of ecological and socioeconomic characteristics. For this reason, improving the productivity of agricultural systems (especially degraded hillslopes) is critical to help relieve pressure on KSNP forests, and from over-reliance on NTFPs for forest conservation. This is important not only to institute viable ICDPs, but because

soil productivity in buffer zones is particularly poor, especially in comparison with soils located deep within KSNP.

The long-term viability of conserving Kerinci's forests is seriously undermined by the unwillingness of Indonesian forestry officials to consider strategies that extend property rights to segments of the local population to use and manage forest resources within KSNP, and to improving the productivity and sustainability of existing agricultural systems as part of forest conservation strategies (ICDPs). The absence of such considerations thus far has not fostered forest conservation, on the contrary, use of park forest lands and resources are out of control in many areas. Previous approaches such as forced or "voluntary" relocation were not only costly and ineffective, but served to create animosity between local communities and park managers. Working towards tenure and locally-based management institutions for the sustained-yield harvesting of *C. exilis* represents one means to develop more effective and integrated ways to achieve forest conversion in KSNP. Thus, as Richards concludes (1993:26), "there are strong arguments to focus future efforts on the development of multiple product forest management in extractive reserves, which provide the tenure and institutional basis in which such changes in resource use can equitably take place." Managed *C. exilis* harvesting in KSNP should be pursued as a short-term and limited palliative, but a necessary one while the longer term goal of sustainable diversified livelihoods is pursued.

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ENDNOTES

1. For more detailed information on the farming systems of Kerinci central valley inhabitants see Belsky 1991, 1993 and 1994; on the history of the rattan trade see Siebert 1989; and on ecological and demographic characteristics of rattan see Siebert 1993 and 1995.

2. These statistics vary enormously depending on the source, and particularly if regional variations are not noted or generalized. For example, WWF (1991) reports the population of the Kerinci enclave as 360,000 and growing at an annual rate of 3.6 percent.

3. For a thorough discussion of the difference between open versus common managed resources and the role of community management institutions in forest conservation see Jessup and Peluso 1986, McCay and Acheson 1987, Berkes 1989, Feeny *et al.* 1990, Bromley 1991.

4. The situation is likely to be different in southern Kerinci where it appears that forest conversion is also undertaken by wealthier landowners who finance and make labor arrangements for expanding their cinnamon holdings (Aumeeruddy 1992).

5. One early management plan for KSNP proposed the designation of multiple use zones including a sanctuary zone where no human activ-

ities would be permitted, a wilderness/conservation zone where humans could enter but not disturb habitat, and an intensive use zone—which would include a buffer zone, traditional use zone, land rehabilitation zone, and a zone dedicated to expanding outdoor recreation and tourism opportunities. Forest product collecting was to be permitted in the intensive use zone (Rauf 1987).