

Forest-product Trade in a Lowland Filipino Village¹

STEPHEN F. SIEBERT² AND JILL M. BELSKY³

Forest-product use among nonforest dwelling cultural groups in Southeast Asia is not well known, particularly in contrast to what is known about indigenous forest-product collectors. A case study in one lowland Filipino village in Leyte, Philippines, revealed that over half of village households depend upon 8 species of commercially valuable rattan and 8 species of timber as a primary source of livelihood, and that all village households collected forest-products for supplementary and emergency income. The future of the rattan and timber trade on Leyte is seriously threatened by agricultural encroachment and intensive collecting pressures in the absence of forest management.

Forest products are a major component of export trade in many developing tropical nations (FAO, 1980). While tropical hardwood production currently dominates the trade, many Southeast Asian countries also have significant internal trade in and export a wide variety of "minor" or nontimber forest products including: rattan, gums, latexes, oils, resins, medicinal plants, wild foods, and ornamentals (Cobban, 1968; Prescott-Allen and Prescott-Allen, 1983). Terming these forest products "minor" is actually misleading. The Southeast Asian rattan industry alone is worth US \$1.2 billion a year (Shane, 1977) and employs roughly half a million people in collection, cultivation, processing, and cottage-scale manufacturing (IRDC, 1980). While rattan is currently the second most important forest product in Southeast Asia (after timber) (IRDC, 1980), before the Second World War and onset of large-scale harvesting of virgin forests, rattan was the most important forest product in some countries (e.g., Indonesia, Welles, 1978).

The international market demand for forest products is strong and growing. As supplies of tropical hardwoods decline, their value will continue to rise. Market analysis of rattan reveals that international consumption could be tripled if high quality raw material was consistently available and marketing better organized (IRDC, 1980). The domestic profitability of rattan and timber could also be increased by expanding local processing and manufacturing capabilities.

The importance of forest products for local communities in Southeast Asia is difficult to exaggerate. In addition to providing food, medicine, and the raw materials needed for home construction, weaving, and tools, forest products represent the sole source of cash income for thousands of forest-dwelling households (Brown, 1920; Burkill, 1966; Peluso, 1983; Weinstock, 1983), and an important supplementary income source for tens of thousands of others (IRDC, 1980). In addition, the labor-intensive nature and decentralized trade structure of rattan and other nontimber forest products provides more benefits to local village economies than does the timber industry (Dransfield, 1981).

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² Dept. of Natural Resources, Cornell Univ., Ithaca, NY 14853.

³ Dept. of Rural Sociology, Cornell Univ., Ithaca, NY 14853.

Forest-product trade is well documented among indigenous, forest-dwelling peoples (Schlegel, 1979; IRDC, 1980; Conelly, 1985; Weinstock, 1983); however, comparable information is lacking for cultural groups that live in more developed areas adjacent to forest lands. This article explores the species utilized and economic importance of commercially marketed forest products in one lowland Filipino village in Leyte, Philippines, that is located adjacent to public forest lands. The data were collected by the authors during one year of residence and field work in the village from February 1983–February 1984.

SETTING

Leyte is the eighth largest island in the Philippines and one of the most densely populated; its 1.3 million, largely rural inhabitants live within a 6,270 km² area (a population density of 208 persons/km²). Leyte (along with the nearby island of Samar) is one of the poorest regions in the country; 73% of the families in the region are unable to generate sufficient food or cash income to meet basic needs (Hobgood, 1982). Most of the island, including the entire coastal plain and the majority of low hills and slopes, has been converted from forest to intensive agricultural uses, including coconut and sugar cane plantations and irrigated rice. However, in central Leyte is a rugged mountain range largely uninhabited, undeveloped, and covered with primary forest growth.

The case-study village is located in west-central Leyte, approximately 3 km east of the Camotes Sea and 8 km northeast of the market center of Baybay (Fig. 1). The village was originally settled in the early 1900s by immigrants from the neighboring islands of Bohol and Cebu. Since World War II, continued immigration of Leytenos and natural population growth resulted in a rapid increase in both the number of households and intensity of land use in the area. The village currently comprises 63 households with 319 residents.

The topography of the region is varied and dramatic. A narrow alluvial plain devoted almost exclusively to the cultivation of irrigated and rainfed rice extends 2–3 km inland from the coastline. Gently rolling hills and ridges, planted principally to coconut, bisect the plains. Farther eastward the ridges become higher and broader, while the flat rice lands become narrower; 1–2 km east of the village rise steep, heavily forested mountain ridges.

FLORA

The flora of Leyte comprises a large number of families, genera, and species. While only about 10% of the island remains in well-developed forests, 3 distinct vegetation types can be found. At low elevations, from sea level to about 500 m, large trees belonging principally to the Dipterocarpaceae are the dominant plant form. This zone is commonly referred to as High Forest or Dipterocarp Forest (Pancho, 1983). Between 500 m and the higher ridges and peaks (elevation 900–1,000 m), dipterocarps are replaced by other species, trees become smaller and are spaced farther apart, and epiphytic growth increases. This forms the Mid-Mountain Forest zone. On the top of the higher ridges and peaks, canopy height is reduced to 10–15 m, trees are covered with a dense growth of epiphytic mosses and liverworts, and vegetation is frequently enveloped in clouds: hence, the name Mossy or Cloud Forest.

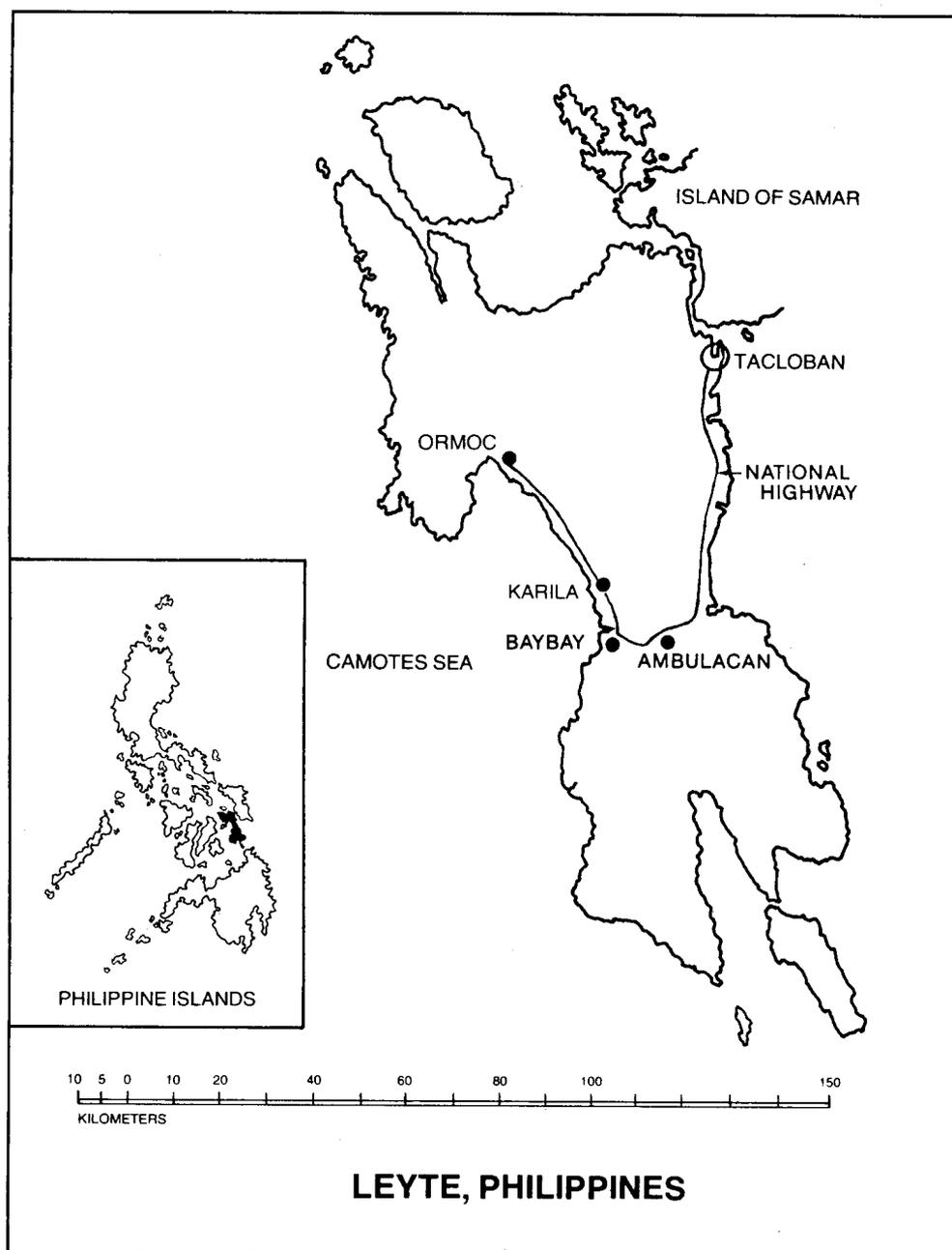


Fig. 1. Map of Leyte, Philippines, showing case-study village and principal towns.

The forests of central Leyte contain the last stands of commercially valuable forest products on the island. In addition to commercially collected species, the forests also provide a wide variety of edible and medicinal plants, wild game, and construction and weaving materials that are indispensable to household domestic

TABLE 1. TIMBER SPECIES.

Scientific name*	Local Cebuano name
<i>Pterocarpus indicus</i> Willd. Siebert 21	naga narra
<i>Shorea contorta</i> Vid. Siebert 335	white lauan
<i>S. negrosensis</i> Foxw. Siebert 337	red lauan
<i>S. polita</i> Vid. Siebert 336	red lauan
<i>S. polysperma</i> (Blco.) Merr. Siebert 338	red lauan
<i>S. squamata</i> (Turcz.) Dyer ex Vid. Siebert 341	white lauan
<i>Parashorea malaanonan</i> (Blco.) Merr. Siebert 342	white lauan
<i>Dipterocarpus grandiflorus</i> Blco. Siebert 340	apitong
<i>Hopea philippinensis</i> Dyer Siebert 339	gisok
<i>Artocarpus blancoi</i> (Elm.) Merr. Siebert 135	antipolo

* Voucher specimens deposited in the Herbarium, Visayas State College of Agriculture, Baybay, Leyte, Philippines.

needs. These forests all lie within public administered lands, Bureau of Forest Development (BFD), classified as "inalienable and nondisposable" (i.e., they are designated permanent forest reserves and are not available for transfer to alternative agricultural or settlement uses) (BFD, Tacloban Office, pers. comm.).

Timber harvesting in the village area is confined to the Dipterocarp Forest Zone. Six species of dipterocarps, collectively known locally as *lauan*, comprise approximately two-thirds of the volume of the commercial timber trade (Table 1). *Pterocarpus indicus*, the national tree of the Philippines and an important furniture-making species, makes up the majority of the remaining third of the trade. In addition to these 7 major timber-tree species, 2 other dipterocarps, *Hopea philippinensis* and *Dipterocarpus grandiflorus*, are harvested for home construction and occasionally enter the commercial market, while *Artocarpus blancoi* is used in the construction of small, dugout fishing boats, which are sold to fishermen along the coast.

As with the vegetation in general, the rattan flora of Leyte is rich. Three genera, *Calamus*, *Daemonorops*, and *Korthalsia*, are found on the island, with *Calamus* and *Daemonorops* represented by numerous species. Rattan is also abundant; numerous clusters, albeit principally young plants, can be found in all forest types except the Mossy Forest Zone.

Eight species of rattan are gathered by village collectors for commercial sale (Table 2). *Calamus ornatus* var. *philippinensis* (*kalapi*), *Calamus* sp. (*magbagaki*), *Calamus* sp. (*tomalim*), and *Calamus* sp. (*tagsaon*) currently dominate the commercial rattan trade. *Calamus microcarpus*, *Daemonorops ochrolepis*, and *Daemonorops pedicellaris* are also gathered commercially on a small scale. *Calamus merrilli* (*palasan*) was collected to the near exclusion of all other species prior to 1982 and is still considered to be the premier furniture-making species. However, uncontrolled harvesting exhausted supplies and it is now no longer of commercial importance.

FOREST-PRODUCT COLLECTION AND TRADE

Before 1982, the BFD granted concessions throughout Leyte for the harvest and sale of high value *Calamus merrilli* to export furniture manufacturers on the island of Cebu. However, due to extensive overcutting and the exhaustion of

marketable-sized canes, a total ban on all rattan gathering from public lands was enacted in March 1982. Consequently, the harvesting of rattan and timber is now illegal on Leyte.

Despite being illegal, the forest-product trade on Leyte is large and vigorous. Many communities surrounding the central forest have small sawtimber and rattan-furniture businesses. For example, the municipality of Baybay has 2 small lumber companies and 20 rattan furniture businesses. The resource base of the rattan industry in Baybay is centered in 2 areas: 1) the forests to the east of the case-study village, and 2) the Ambulacan area along the national highway. Timber is harvested wherever it is available and accessible. All rattan and timber marketed in Baybay is gathered illegally from public forest lands. Local BFD personnel "recognize that cutting (of rattan and timber) continues," but report that they "get no support for enforcement from higher-ups, therefore [they] overlook small scale, family-oriented enterprises" (BFD, Tacloban Office, pers. comm.).

Gathering rattan involves the following procedures: if the weather is favorable (i.e., rivers are not impassable due to flooding) and there are orders from furniture businesses, an average of 10–20 men leave the village and a neighboring community each morning to collect rattan. Working in groups of 2–4, the men walk upstream on paths and in the stream itself to the top of the watershed at 850 m, then descend 200 m into a large primary forest. The distance from the village to this rattan collecting area is 8 km, or about a 2-h walk. Collectors then traverse the forest scanning the understory for marketable-sized rattan. Once rattan is located, the long canes are cut at their base with a machete and pulled down out of the trees. When the rattan is dislodged and on the ground, one end is tied (using split rattan strips) back onto itself to construct a shoulder harness for hauling. The collection process requires about 2 h.

While in the forest the men also check leg snares they have set during previous trips for wild boar (*Sus celebensis* var. *philippinensis* Nehring) and deer (*Cervus philippinus* Smith). After a short break for lunch, collectors drag the canes (some over 30 m long) back over the ridge and down the stream to the village. Each collector then cuts his cane into 4-m lengths (poles) and bundles them together. Rattan is transported to furniture businesses in Baybay, using either public jeep service or trucks provided by furniture makers, and sold directly to furniture manufacturers.

Rattan gathering is considered by local residents to be one of the most physically gruelling and undesirable jobs in the village. In addition to the long hike, cold rains and leeches are frequently encountered, bees' nests are occasionally pulled down out of the canopy along with rattan, and collectors increasingly fear encountering heavily armed military personnel, or "New People's Army" antigovernment guerillas, while in the remote basin. In addition, military personnel have threatened to confiscate rattan while it is being transported to market unless they are paid a "fine."

Timber harvesting poses fewer dangers and less discomfort than rattan gathering as it involves less local labor and is conducted closer to the village. Nonvillage loggers, working under contract with Baybay timber companies or as independents, cruise the forest in search of large, high quality dipterocarps and *Pterocarpus indicus*. They fell the trees with chainsaws, rough cut the logs to desired dimensions and then hire local residents to transport the wood to a loading site in the village. The size of the trees felled during 1983 averaged 50-in diameter (above buttress)

TABLE 2. COMMERCIALY GATHERED RATTAN SPECIES.

Scientific name ^{a,b}	Local Cebuano name
<i>Calamus merrilli</i> Becc. Siebert 3	palasan
<i>C. microcarpus</i> Becc. Siebert 7	potian/obanon
<i>C. ornatus</i> Bl. ex Shult. var. <i>philippinensis</i> Becc. Siebert 2	kalapi
<i>C. sp.</i> Siebert 5	magbagaki
<i>C. sp.</i> Siebert 1	tomalim
<i>C. sp.</i> (possibly <i>C. moseleyanus</i> Becc.) Siebert 9	tagsaon
<i>Daemonorops ochrolepis</i> Becc. Siebert 6	nukot/pagiti
<i>D. pedicellaris</i> Becc. Siebert 8	hanamham

^a Voucher specimens at Kew (K).

^b Extensively harvested prior to 1982; currently not collected due to exhaustion of supplies.

with a 50–60 ft unbranched bole for dipterocarp species and 30-in diameter with a 40–50 ft unbranched bole for *Pterocarpus indicus*. As only the most valuable trees are removed, this type of timber harvesting can be considered a form of selective high grading.

Local residents also fell trees for domestic purposes; however, since they use axes and handsaws, the trees tend to be smaller. Most timber harvesting for noncommercial purposes is confined to post-sized trees (8–12-in diameter) for use in home construction and occasionally a 16–24-in diameter *Artocarpus blancoi* for use in boatbuilding.

VOLUME AND VALUE OF FOREST-PRODUCT TRADE

The forest-product trade on Leyte is based on local market demand for rattan furniture and timber products. Only a fraction of the trade enters inter-island commerce, and then only in the form of a small amount of furniture exported to Cebu. During 1983, market demand for sawtimber was large due to infrastructural development at a local college and construction and furniture orders from northern Leyte, an area of rapid industrialization and rising incomes. The demand for rattan during 1983 was also strong. Local furniture manufacturers purchase most rattan during the months of November, December, April, May, and June due to Christmas, patron-saint day celebrations, and post-graduation related orders. However, rattan is collected and sold by Karila residents during all months of the year.

RATTAN

The volume and value of rattan gathered by collectors in any given day varies considerably, due to: 1) the length of the cane harvested (number of poles), 2) the diameter of the cane, and 3) the current market price. Based on one year of records, approximate volume and value figures have been developed.

Collectors gather an average of 10–15, ¾–1¼-in diameter poles per person per day. Collectors prefer to gather large poles (those greater than 1-in diameter) since they are significantly more valuable than ¾-in poles (Table 3). An average of 25–30 poles are collected per day of smaller diameter *Daemonorops pedicellaris*.

All commercial rattan species command the same price in Baybay with the

TABLE 3. COMMERCIAL RATTAN PRICES.^a

Diameter class	Feb 1983	Dec 1983 ^b	Feb 1984 ^c
½ in	0.60	1.00	1.10
¾	0.80	1.35	1.50
⅞	0.90	1.60	1.75
1	1.10	2.00	2.10
1⅛	1.25	2.50	3.20
1¼	1.50	3.50	3.75
1⅜	2.00	4.00	4.40

^a Prices paid to rattan collectors by Baybay furniture makers in Philippine pesos per 4-m pole.

^b The peso was devalued from p 8.70/US \$1.00 to p 11.20/US \$1.00.

^c The peso was devalued from p 11.20/US \$1.00 to p 14.10/US \$1.00.

exception of *Calamus merrilli*, which is no longer available in the area, and the small-caned *Daemonorops pedicellaris*. Furthermore, all rattan purchasers generally pay the same prices. Large furniture manufacturers occasionally pay slightly lower prices than those quoted in Table 3, but only if their orders are greater than 800 poles.

Rattan collectors earn an average of peso 20.00–25.00 per person per trip. As is evident from Table 3, rattan prices increased dramatically during 1983. Prices are normally highest during the months of peak demand; however, in 1983 prices did not fall after the December peak, but continued to rise. From February 1983–February 1984, rattan prices almost doubled for 1-in diameter and smaller poles and more than doubled for larger canes. Two factors explain this trend: 1) a high inflation rate, and 2) large diameter canes are becoming increasingly scarce.

The volume of rattan collected by villagers during the study period totaled approximately 48,000 poles (no attempt was made to record volume by diameter class, however, the vast majority of rattan harvested was between ¾ and 1⅛-in diameter). Seven Baybay furniture businesses, each employing 1–5 full-time workers, purchased 81% of this production, while furniture manufacturers from northern Leyte and a local college purchased the remainder.

The total value of this unprocessed rattan can be estimated by assuming that the poles averaged 1-in in diameter and had an average value of peso 1.50 per pole. Thus, one year of rattan production in the area was worth approximately peso 72,000 (or US \$6,400 assuming an average 1983 exchange rate of peso 11.30 to US \$1.00).

TIMBER

During 1983, the volume of timber harvested for commercial purposes in the village watershed totalled approximately 50,000 bd ft. Seven dipterocarp species (Table 1) accounted for about 34,000 bd ft, while *Pterocarpus indicus* accounted for 16,000 bd ft. A total of 27 large dipterocarps were cut during this period, each yielding 1,000–2,000 bd ft of useable sawtimber. *Pterocarpus indicus*, which tends to be smaller, produced 300–1,000 bd ft of useable wood per tree and at least 30 trees were harvested.

Loggers pay local laborers peso 0.30–0.45 per bd ft (depending upon the dis-

tance) to haul the timber from the forest to the village. A laborer typically hauls 10–20 bd ft per trip and makes 1–2 trips per day. Earnings from timber hauling can range from peso 5.00–20.00 per person per day, but average only peso 10.00 per day.

ROLE OF FOREST PRODUCTS IN HOUSEHOLD ECONOMY

All households in the case-study village periodically gather edible plants and cut timber for household use, while approximately half of the village households earn income from rattan and timber products. These households depend upon forest products because they are unable to meet food needs (principally rice) through alternative livelihood activities. Only 14% of village households can grow all the rice they consume; they typically own small, irrigated ricefields that household members cultivate. The remaining households are not self-sufficient in rice production and thus utilize other resources including forest products to produce food or earn cash to purchase rice.

When the village is divided into 3 strata on the basis of rice self-sufficiency (RSS), 35% of the households produce more than half of the rice they annually consume (high RSS), 43% grow less than half (middle RSS), and 22% do not grow any of their rice staple (low RSS). It is important to note that these figures are valid for 1983, a drought year when virtually no rainfed rice was grown. Low RSS stratum households do not grow irrigated rice (as owner or tenant cultivators) because they can neither afford to purchase lowland riceland nor establish a labor-sharing or tenant arrangement with a ricefield owner. Consequently, these families, like many Filipino households, rely on alternate sources of income to purchase food.

Households earn cash income to purchase rice and other food through the sale of copra (dried coconut) and abaca (*Musa textilis* L.), seasonal wage labor, hillside farming of corn, rootcrops, and vegetables, livestock raising, and *tuba* (an alcoholic beverage fermented from the sap of coconut) sales. However, access to land and other productive assets (e.g., capital, draft animals, production credit, and tools) is highly variable and many households are excluded from engaging in these livelihood activities. Moreover, the severe drought in 1982–1983 drastically reduced copra, abaca, hillside farming, and *tuba* production, further exacerbating household income-generating problems.

Rattan gathering is a major source of income for approximately one-third of village households; these households are predominantly in the low and middle RSS strata (Table 4). Rattan collectors are typically male co-household heads between 21–38 yr old. Occasionally unmarried sons of older and higher RSS strata households collect rattan for supplementary cash income. The yield of rattan collecting is high in comparison to daily wage labor; rattan gatherers earn approximately peso 20.00–25.00 per day while agricultural laborers (e.g., collecting coconuts or weeding hillside farms or ricefields) earn only peso 10.00–15.00 per day. Furthermore, rattan can be collected by any physically capable person and sold at any time of the year, while wage-labor opportunities in and near the village are seasonal and irregular.

Timber-based wage labor is always a supplementary economic activity and is

TABLE 4. FOREST-PRODUCT USE BY HOUSEHOLD RICE SELF-SUFFICIENCY^a (IN %).

Forest-product activity ^b	Use by household rice self-sufficiency status			
	Low (n = 14)	Middle (n = 27)	High (n = 22)	Total (n = 63)
Rattan gathering	57	37	9	32
Employment as timber laborer	43	33	36	37
Either rattan or timber	79	48	41	52

^a Household rice self-sufficiency refers to the ability of a household to meet its rice consumption demands through rice farming (whether irrigated or rainfed, or as owner-cultivators and sharecroppers).

^b At least one adult household member (15 yr and older) gathers rattan, at a minimum on a weekly basis, or accepts work as a timber wage laborer whenever work is available.

less remunerative than rattan collecting (peso 10.00 per day). No household relies on timber-wage labor as a primary source of income and households from all 3 RSS strata are involved (Table 4).

Forest products (principally rattan) are economically most valuable to low RSS households who depend upon them as their major source of income and, thus, their principal means to purchase food. These households are most likely to be in the early stage of the domestic life cycle, have few productive resources, high household consumption demand, and, as of yet, low labor availability. Not surprisingly, these households spend proportionately more time engaged in rattan gathering than do other households and more highly value rattan collecting vis-à-vis other livelihood activities (Belsky, 1984).

Since forest products are a resource of the public commons, they can be utilized by all households during times of economic hardship. During 1983, 13% more households collected rattan to supplement income lost due to drought than either before or after that period. Importantly, these additional rattan gatherers were from the two upper rice self-sufficiency strata that usually do not engage in rattan collecting (Belsky and Siebert, 1983). Rattan is periodically gathered by better-off families when income is needed for emergency medical, funeral, educational, or wedding expenses.

FUTURE OF FOREST-PRODUCT TRADE

The future of forest-product trade in Leyte and in most other areas of the Philippines appears bleak. Demand for forest products continues to grow while the availability of supplies is rapidly diminishing. Prior to the 1970s, all rattan harvesting in the village area was confined to the western slopes of the central mountain range (within 6 km of roadside loading points). When marketable-sized canes were depleted in this area, collectors shifted to the present collection site on the east side of the mountains (8–10 km from the village). This area has sustained heavy rattan harvesting for over 10 yr. Marketable-sized canes are now becoming rare in this area and collectors report that supplies will probably be completely depleted by mid-1984. Already many regular collectors have shifted to another basin to the northeast, about 12–14 km from the village. While large-diameter rattans are currently abundant in this distant basin, collectors report that this is the last supply of rattan in the entire region. Forests farther east and south already sustain heavy rattan cutting by collectors from other Leyte com-

munities. At present harvesting rates, collectors estimate that there is about a 3 yr rattan supply in this last reserve.

Present rattan harvesting rates may also increase as a consequence of growing market demand and the exhaustion of supplies elsewhere. In December 1983 rattan supplies were depleted in the southern Baybay mountains, leaving 10 furniture businesses without a source of cane. They responded by ordering supplies from the only other source in the region—the village investigated in this study. Further pressure on rattan supplies is also likely to arise as Philippine economic conditions deteriorate and more households are forced to seek additional income.

Gathering rattan in the newly opened, distant basin possesses several problems. First, collection trips require 2 days of labor instead of one: one day to reach the area and gather the rattan, and a second day to haul it back to the village. The increased time required for rattan gathering may reduce labor allocated to other livelihood activities such as food production. Secondly, rattan gathering in this basin is more dangerous. Malaria is reportedly found in the area, antigovernment guerillas use the region as a base, and the number of government military patrols is increasing.

The future prospects for commercial timber harvesting in the village watershed are likely to follow the same pattern as for rattan. Present harvesting rates and selective cutting practices exceed growth and reestablishment rates of timber species, particularly for dipterocarps. Furthermore, increasing land-use pressures are resulting in both conversion of more distant forest to agricultural uses and a shift from long fallow swiddens, in which large trees are retained, to permanent hillside farms with few, large timber trees. This trend will affect the availability of dipterocarp species most profoundly as their regeneration usually requires the maintenance of at least partial forest cover (Sy and Lasmarias, 1982). The availability of *Pterocarpus indicus*, a more rapid-growing species, will be less affected by land-use intensification. However, neither dipterocarps nor *Pterocarpus indicus* can continue to be harvested at current rates without depleting the resource base.

The demise of the forest-product trade in the case-study village will result in the loss of a primary income source for many households, especially those most economically disadvantaged. Regular income-generating alternatives to rattan and timber do not exist at present. Irrigated rice farming, copra and abaca production, and hillside farming are all virtually closed to new or young families due to land shortages. Even sharecropping arrangements are difficult to obtain, particularly since the 1972 Agrarian Land Reform program, which led to landowner's fearing that tenants may try to use the laws to seize their land. Similarly, alternate sources of wage labor are few and seasonal and there is no indication that new or more regular employment opportunities will develop in the future.

Since forest-product collecting is most important to those households that are least self-sufficient in terms of rice production and faced with the fewest alternative food and income-producing opportunities, the exhaustion of rattan and timber supplies will undoubtedly cause them severe hardship. Furthermore, since rattan gathering is a major livelihood activity of the young, the problem is likely to grow as greater numbers of young people enter the labor force (47% of the village population is under 15 yr old). Lastly, the traditional reliance upon forest products during times of emergency income need will end. When next faced with a sudden

and urgent need for cash, households of all socioeconomic levels will have fewer economic alternatives.

CONCLUSION AND IMPLICATIONS

The only likely means by which the forest-product trade on Leyte and many other areas of the Philippines can be maintained is through a major, long-term commitment to rattan and timber cultivation and management, involving both government agencies and local village forest-product collectors. Some of the basic requirements for developing a rattan and timber management program already exist: the Philippine Forest Research Institute (FORI) has initiated rattan cultivation, management, and selection programs; simple, though incomplete, instructional materials are available (e.g., *How to Grow Rattan* by Maximino Generalao, 1981); large-scale commercial cultivation of timber and rattan that incorporates small farmers is under consideration; and successful integration of rattan cultivation into swidden fallow cycles has been documented in Indonesia (Weinstock, 1983). Much more work needs to be done on Philippine rattans, especially in comprehensive sampling and identification of wild species and provision of good quality seeds and seedlings for cultivation. However, sufficient information is already available to begin commercial cultivation and management of *Calamus caesius* (Dransfield, pers. comm.).

Obstacles to implementing forest-product cultivation and management programs clearly exist, particularly with respect to program funding and land tenure. However, most of the farmers in the study village already cultivate fruit and timber trees in their hillside farms, notwithstanding the long period of yield deferral perennial cultivation entails and the fact that their farm parcels are actually public forest lands. Unless efforts to cultivate and manage forest products are initiated in the near future, wild supplies of commercial rattan and timber will be depleted, resulting in irreplaceable income losses for thousands of impoverished households that depend upon the forest-product trade for their survival.

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