Chapter 14

Palm utilisation for basketry in Xini Ward, Sengwe communal areas, Zimbabwe

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Common names	Part of the resource used	Management	Degree of transformation	Scale of trade	Geographic range
Ilala palm, Ilala	Leaves	Wild	Medium	International	Medium

ABSTRACT

People living in the south-eastern lowveld of Zimbabwe have utilized and managed the palm, *Hyphaene petersiana* Klotzsch, since time immemorial. In Sengwe the palm grows in the wild, especially in the flood plains of the Mwenezi and Maose rivers. This paper seeks to document and assess the performance of the basket industry in Sengwe Communal Areas.

The data presented in this paper were collated from reports based on various independent studies conducted in this area from 1993 to 1999 but are mainly based on the findings of an M.Sc. thesis completed by the author in 1998. A further study was also conducted in 2001.

In 2001, the basket industry contributed 20% to annual household income representing an annual income of US$21 from basket sales compared to US$14.8 in 1998. To date, the industry has not resulted in visible impacts on the resource base. Major changes have been experienced in areas of social organisation and trade facilitated by various research and rural development institutions. This case study therefore has demonstrated that, with support, community-based industries can be viable.

INTRODUCTION

Hyphaene petersiana in southern Africa

The basketry industry has been growing in most countries in southern Africa. This has come about due to both economic hardships aggravated by persistent

droughts and developments in the tourism sector, the main market for these products. In Botswana the industry expanded in the early to mid-1970s when marketing organisations were established (Cunningham and Terry 1993). In the Estha region in Botswana the industry had become so important that the resource became scarce and cultivation had to be adopted (Cunningham and Terry 1993).

Studies in Namibia showed that the basketry industry was very important to the livelihoods of the people of Owambo region, as it provides both household utensils and the means of generating income (Konstant *et al.* 1995). *Hyphaene petersiana* does not grow in South Africa, but rural people use a similar species, *H. coriacea*. Craft work from *H. coriacea* accounted for 75% of the craft products made in Maputaland in 1983 (Cunningham 1987).

Indigenous people of Zimbabwe have utilised the palm *H. petersiana* for sap tapping and craft work for centuries (Meredith 1948; Pardy 1955). The young leaf is used for baskets, the fresh rachis for mats and the dry petioles for doors and chairs. Women use the fan leaves in making tablemats and also as a thatching material (ENDA unpublished; Sola 1998).

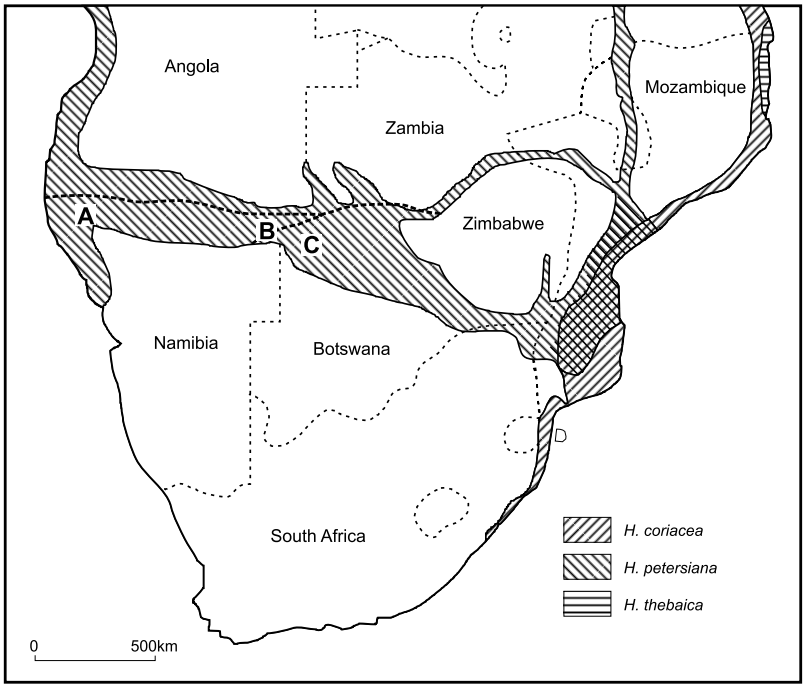
(Hyphaene petersiana)

Distribution and growth

H. petersiana is found in most southern African countries (Figure 1) on alkaline, saline, sodic soils and clay rich sands (Cunningham and Terry 1993; Sola 1998). In Zambia, *H. petersiana* has been described as occurring in hot and dry valleys in gregarious stands, on friable loams to heavy clays (Fanshawe 1967). In Zimbabwe, Wild and Grandvaux Barbosa (1967) stated that this palm grows in riverine areas and in locations where water is available. In Botswana, on the other hand, the palm occurs in sandy soils, while in Namibia it is restricted to windblown coastal sands (Cunningham and Terry 1993).

During the initial growth stages the palm concentrates on the development of the underground stem and aboveground maintains little foliage of only about seven leaves in an adaptation to low water table conditions. So, besides massive, long subsurface roots that capture floodwaters the palm has a long tap root for dry season water acquisitions (observation). Once the underground stem is well established—a process that takes about seven years—the palm begins to develop the aboveground stem (Fanshawe 1967). However, Sola's (1998) study on sap tapping showed that all ramets have an underground carbohydrate storage organ from which roots emanate. It could be the development of this organ that delays the aboveground stem development. After this stage the palm is able to produce harvestable leaves of more than 60 cm, presumably because the stem is big enough to support them.

Figure 1. The distribution of the palm *Hyphaene petersiana* in southern Africa



Source: Cunningham and Terry 1993.

Once the stem is more than 1.5 m tall the palm is rarely harvested for craft production since cutting of the leaf at the rachii-petiole junction is complicated by the height and usually these palms produce hard leaves which are too brittle and unpliable for craft production. It takes 90 years for a palm to reach a height of 30 m (Fanshawe 1967).

Leaf production in *H. petersiana* juvenile plants is a continuous process at the rate of 1.0 to 1.5 leaves per month (Fanshawe 1967). Cunningham and Milton (1987), however, found that palm suckers produced 3.8 leaves per year in plants of leaf-size class 101 cm to 120 cm and 2.8 leaves per year in plants of leaf-size class 41 cm to 60 cm. In another study conducted in Zimbabwe a similar result of four leaves per year for the size class 101 cm to 120 cm was recorded (Sola 1998).

Besides craft production *H. petersiana* is also used for sap tapping for the production of a local wine. Tapping is usually done between August and March of the following year. It is a man's activity and a skilled tapper can tap 25 to 50 ramets per day. The wine sells for US$0.16[2] per litre (Sola 1998). Sap tapping involves burning of clumps to remove dead leaves and pruning of the ramets to expose the underground carbohydrate storage organ. Tappers insert V-shaped leaves into trimmed ramets for sap collection. Tapping continues until most, if not all, of the meristem has been removed. It is this process that poses a threat to the basket industry since not all ramets recover, especially when all the meristem has been removed (Sola 1998). However, most of the ramets recovered through suckering and shoots if some meristem remained.

Another threat to the basketry industry is resource scarcity. Cunningham and Milton (1987) found that as the craft industry expanded, the leaves became time-consuming and expensive to obtain because of ever increasing distances to harvesting areas. In Botswana, high harvesting intensities with an offtake rate of 30% resulted in a decrease in leaf size (Cunningham and Milton 1987). Besides leaf harvesting and grazing by livestock the greatest threat to *H. petersiana* is land use conversion.

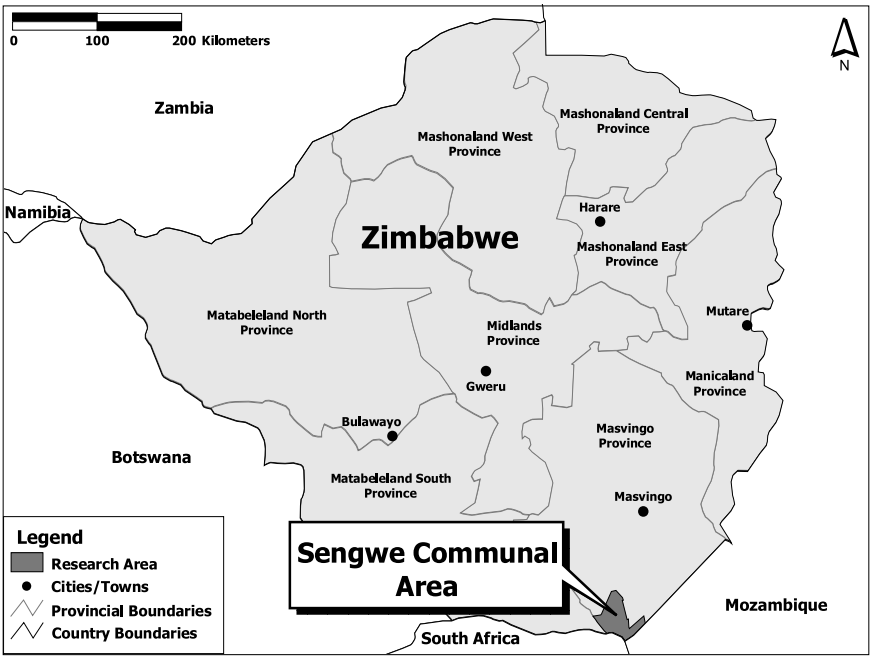
Study area: Sengwe Communal Areas

Sengwe Communal Areas is located in south-eastern Zimbabwe, in an area bordering South Africa and Mozambique (Figure 2). Low rainfall and frequent droughts threaten household food security as they negatively impact on crop and livestock production, the two major sources of household income (Sola 1998). To supplement their household income the people of Sengwe have adopted craft production activities using forest resources, of which the palm is the most widely used (ENDA unpublished).

Study site: Xini ward

This study focuses on Xini (22°05'S: 31°20'E), one of the four wards in Sengwe Communal Areas. The area is bounded by the Zimbabwe–Mozambique border, Gona re Zhou National Park and Malipati safari area. Xini ward shares borders with Sengwe ward and with Xibavahlengwe ward in the north.

Figure 2. Map of the study area



Source: ESRI Data and Maps 2002.

The mean annual temperature is 24.4°C, while mean maximum and mean minimum temperatures are 32.3° C and 16.5°C, respectively. High temperatures occur between October and March when they can exceed 40°C (ARDA unpublished). Most of the area is between 302 m and 610 m above sea level. The annual rainfall is low and erratic, measuring around 450 mm per year.

The study area covers about 820 km^2 with a total population of 9,080 distributed over 1,597 households. It has a natural annual growth rate at 3.3% (ARDA unpublished). Access to the study area is by all-weather road approximately 200 km (ARDA unpublished). The road network within the study area measures about 100 km of seasonal roads, which are strongly affected by the yearly flooding of the rivers.

Soils vary according to distance from the main river, Mwenezi. Adjacent to the river, soils are deep sands from recent alluvium (ARDA unpublished). Further inland there are siallitic soils and heavy textured soils together with vertisols (ARDA unpublished).

No detailed vegetation surveys have been carried out in Sengwe. Wild and Grandvaux Barbosa (1967) described the vegetation, on a large scale, as discontinuous dry savanna woodland and thicket with tree or shrub savanna of *Acacia* and the palm *Hyphaene petersiana*. A more recent study indicated that the most dominant tree species on the heavy clays (which are closely associated with the palm) is *Salvadora augustifolia* (Sola 1998).

THE PRODUCTION-TO-CONSUMPTION SYSTEM

Resource base

The palm *H. petersiana* belongs to the family Palmae (Photo 1). The species is dioecious and the proportion of male to female plants is usually 1:2 (Fanshawe, 1967). The short lived male flowers are produced in fairly short tangled spikes among the leaf bases. The larger, short stalked female flowers are produced in large branched sprays, which develop into heavily branched trusses of fruits (September to October), as is typical of the species. Fruits are produced in large quantities (up to 2,000) and take two years to mature. Seeds are borne in the globular fruit in a fleshy and edible endocarp. They are susceptible to desiccation and have a short dormancy period (Fanshawe 1967; Palgrave 1988).

The life of a juvenile leaf is approximately 12 months (Fanshawe 1967), but dead leaves remain on the stem for over two years (Cunningham 1988). The stems of juvenile palms are short and are well underground, about 25 cm below the soil surface (Corley *et al.* 1971). The palm shoot grows by continuous leaf production from a single apical meristem (Fanshawe 1967; Cunningham 1988; De Steven 1989), whose loss is not compensated for by lateral branching. *H. petersiana,* like all clonal growing plants, produces iterated modular units (ramets) of the same genotype that are potentially capable of independent growth and reproduction.

Photo 1. A mature *H. petersiana* tree with a few fruits in the mopani woodland in Chishinya, Sengwe Communal Areas (Photo by P. Sola)

Craft production depends heavily on the rate of leaf production and on the growth rate of new leaves. Leaf production determines the number of leaves on each plant while the growth rate determines how many leaves can be harvested at any one time. On average the ramets produced one leaf in three months, which gave an estimate of four leaves per ramet per year (Sola 1998).

The structure is not the typical reverse J, an indicator of growing populations. This is so because stems are repeatedly cut for sap tapping and as such are not naturally growing. As a result there are few adult trees. Hence palms in the harvestable categories accounted for 95.09% of the total population with a density of 974.5 ramets per hectare (Table 1).

On average each ramet has 1.72 harvestable leaves (longer than 60 cm), which gave 808.41 harvestable leaves per hectare; these accounted for 48.27% of the total leaves (Table 1). Using the annual leaf production rate of four leaves per ramet (Sola 1998) the production potential of the ramets in Xini ward is therefore 3,233.75 leaves/ha/year.

RAW MATERIAL PRODUCERS AND THE SOCIO-ECONOMIC CONTEXT

Population

In 1993, Xini ward had a population of 9,080 people, 5,173 of them females and 3,907 males (CSO 1993). While the distribution is similar to the national scenario, the situation in Xini is compounded by the continued migration of young men into South Africa in search for employment. The average household size in Xini ward is 5.7 people.

Livelihood activities

Farming systems are based on extensive livestock production. Over 86% of the households in Sengwe own livestock (ARDA unpublished). Rain-fed crop production is the norm. On average a household cultivates 2.2 ha per season. Most of the time activities have to be carried out according to priority. Sola's study of 1998 showed household participation in craft production was inversely related to crop production labour demands (Figure 3).

Household income

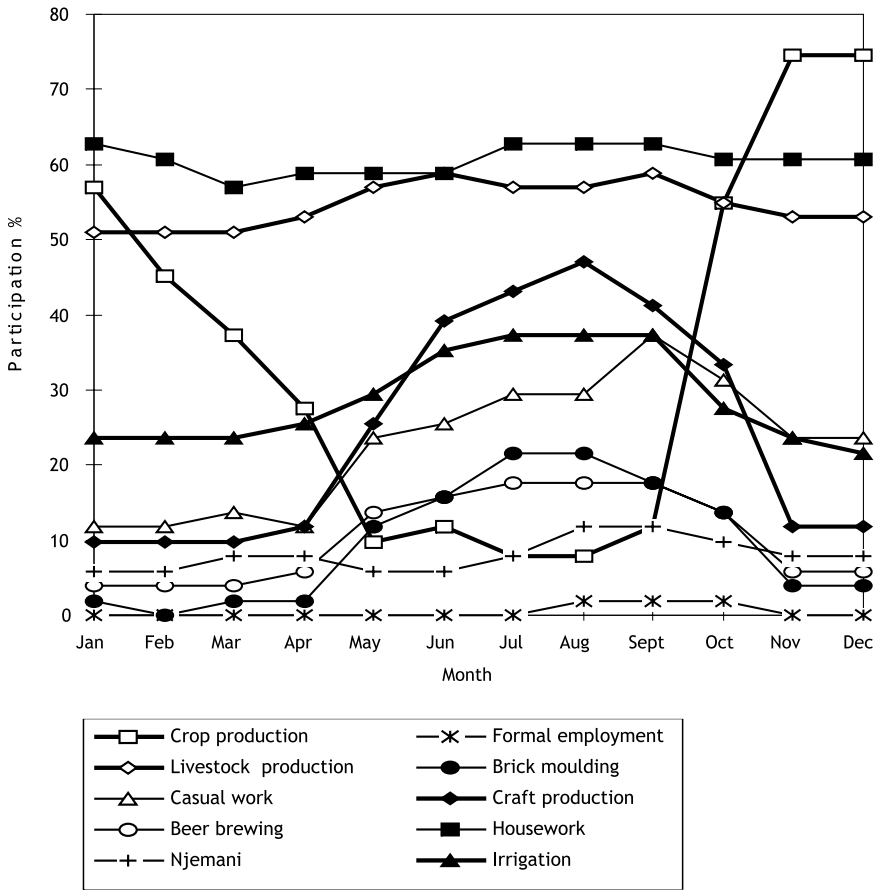
According to the Mabalauta Working Group (2000), most cash from livestock sales comes from cattle even though 40% of the Xini population do not own cattle. Goats and chickens are the most widely owned domestic animals. There are five irrigation schemes in Xini, all situated in the flood plain of Mwenezi River within the palm area. During good seasons a family can make as much as US$4.00 per week from sales of horticultural produce.

Remittances play a big role in family income generation (ARDA unpublished; ENDA unpublished; Sola 1998; MWG 2000). According to ENDA, 45% of the people in the study area have family members—in most cases, sons—elsewhere who send money or goods to them (MWG 2000).

Table 1. Status of the *H. petersiana* population in Xini

	Stem height (cm)					Leaf status					
	Under	0–30 ground	31–150	>150	Total	Abnormal	Defoliated <60 cm	Unharvestable >60 cm	Harvestable	Harvested	Total
Number	57	133	60	13	263	11	4	175	218	44	452
Number/ha	211.11	492.57	222.22	48.15	974.05	40.75	14.81	648.12	807.48	162.97	1674.77
Percentage	21.64	50.58	22.81	4.91		2.47	0.09	38.72	48.24	9.77	

Figure 3. Proportions of Xini households engaged in particular livelihood activities during 1998 (%, n = 54)



Craft production

Approximately 93% of all the community members have at one time or another participated in palm activities (Sola 1998). As a result, palm craft sales, especially mats, brooms, and baskets are ranked third as sources of household income by women palm producers (ENDA 1993; Sola 1998; MWG 2000). However, the proportions of cash income from palm sales were different for men and women. According to the Mabalauta Working Group, receipts from palm-related products make up 7.6% of the men's income and 19.6% of the women's.

Sola's (1998) study suggested that about 60% of the households in the ward are involved in basket making and made an income of US$14.80 per year. However, Xini households generated US$81.82 on average during that year. An assessment made in 2001 reveals that incomes from the basketry industry accounted for 20.5%, the average annual income of producer households being

US$102.80. Therefore in 2001 the basketry industry contributed US$21.07 to producer household income, an increase of about 42% from the 1998 level.

Access and control

The palm *H. petersiana* grows naturally and as such is a communally owned resource. In Zimbabwe all the land in communal areas is owned by the state while the traditional leadership and local government are just the custodians of the resources growing thereof.

In Sengwe all the palm stands are customarily owned by the Shangaan people by virtue of their being indigenous to the area. The ownership is strictly for sap tapping for wine production, and leaves for crafts may be accessed by all (Sola 1998). Additionally, transfer rights of palm resources by individual producers are based on a patrilineal system.

Each village under a kraal head has its own designated tapping fields and leaf harvesting areas. The chiefs, working through headman, have overall control of palm utilisation. To date they have managed to stop the transportation and sale of unprocessed palm leaves. So far, the impact of traditional rules has been generally positive as it has resulted in the palm being conserved whilst everyone in the designated area has access to the palm for leaf harvesting.

Leaf processing for craft

Leaf processing and weaving is undertaken at the household level by one or two family members. In basket making it is mostly the unopened leaves that are used and they consists of several leaflets, which are opened during drying. The unopened leaf is cut and split into double-leaflets numbering between 21 and 34 per leaf. Leaflets are stranded using a big needle, the midrib is removed and the outer edges of the leaflet are discarded. Midribs are used as the filling material in making fruit and shopping baskets, while in winnowing baskets they are used as weft threads and the inner parts as the weaving material; this makes the product 100% palm (Photo 2). Big artefacts (winnowing baskets, harvest baskets and washing baskets) are made from leaves of about 100 cm length, while smaller artefacts such as wall hangings, fruit baskets and sugar basins are made from leaves of shorter length (Table 2) (Sola 1998).

Weavers were able to differentiate between the sexes of the palm. The male plant was said to have whitish-green leaves that are very brittle and therefore unsuited for craft production, whereas the female plant has dark green leaves that are very pliable and most suited for craft making. Dye production has also to be considered, as it is an activity that is part of the basket making. The dye used to colour the baskets is taken from an indigenous tree, *Bechermia discolor (munyiyi)*. Craft makers collect the bark of the tree, grind it and or mix it with charcoal to produce a dark brown colour, which is preferred over brick red or reddish brown. They then add the bark-charcoal mixture to the palm leaves in boiling water.

Photo 2. SEVACA women in Chishinya village show their artefacts made from palm: winnowing baskets/wall hangings, fruit baskets and mats (Photo by P. Sola)

Table 2. Basket making in Xini

Item		Fruit basket	Shopping basket	Winnowing basket
Part used		Unopened leaf	Unopened leaf	Unopened leaf
Length of part used	Mean	83	103	117
	Standard deviation	50	41	26
Number of parts used per item	Mean	9.33	6.25	9
	Standard deviation	1.21	3.95	1
Making (days)	Mean	1.6	1.75	3.0
	Standard deviation	5	0.96	1.41
Number produced per household per year	Mean	11.3	7.5	6.67
	Standard deviation	4.73	3.54	0.587
Producers (%)		41	44	19

The characteristics of trade and marketing systems

A large number of households with one or two producer members are engaged in palm harvesting and processing. Of the 93% of households that produced crafts, 76.6% produced baskets on a commercial basis while the rest produced for own use and gifts. Also, 57.5% of the commercial producers work in groups, namely the Sengwe Vanani Craft Association (SEVACA). Little technology is used in the production, nothing more than a knife for leaf harvesting and a needle for stranding and weaving. Each individual produces more than one type of artefact (Table 3), perhaps in response to orders from SEVACA.

The Sengwe Vanani Craft Association

SEVACA, a craft-trading organisation based in the Sengwe Communal Areas, was formed in 1997 with financial assistance from the German nongovernmental organisation Terre des Hommes. SEVACA secured support from another two nongovernmental organisations, Environmental Development Activities-Zimbabwe (ENDA-Zimbabwe) and Southern Alliance for Indigenous Resources (SAFIRE), with regards to capacity building and marketing. Like all the other wards in Sengwe communal lands, Xini ward has three producer groups affiliated with SEVACA and a craft shop manned by a sales person. The shop was established mainly for storage and limited local sales. The main activity members were engaged in at group level was training in production for orders. Between 2000 and 2001 SEVACA was receiving orders of up to 6,000 items for four different products.

Trading of palm baskets

About 63% of the produced items are traded for cash. Individuals produced baskets, which are traded locally or are collected by producer groups, graded and sold to the SEVACA association. SEVACA bought the items for US$0.7 to US$1.33, which gave each craft producer a minimum of US$13.09 per annum. The main buyers for SEVACA were the National Handcraft Centre, National Art Gallery, and some foreign buyers in Mexico and Europe. The items were sold with a 20% to 30 % mark-up, giving selling prices of US$1.67 to US$2.0. Between 1999 and 2000 SEVACA made a turnover of about US$500 annually.

Besides the mentioned markets, SEVACA sold some of its items at the Zimbabwe International Trade Fair as well as at Zimbabwe national and provincial agricultural shows. By participating in these events SEVACA managed to secure orders from foreign markets but strong external trade links have not yet formed. The trade in crafts from Xini is summarized in Figure 4.

Most of the grading is undertaken at the association level, where baskets are classified according to set and agreed standards by peer groups. There are many players involved in determining the sales prices, including product owners, buyers and projects officers supporting and employed by SEVACA. Main determinants of the final sales price are size, time it took to produce an item, complexity of shape and patterns used.

Figure 4. The Xini basketry products trade chain

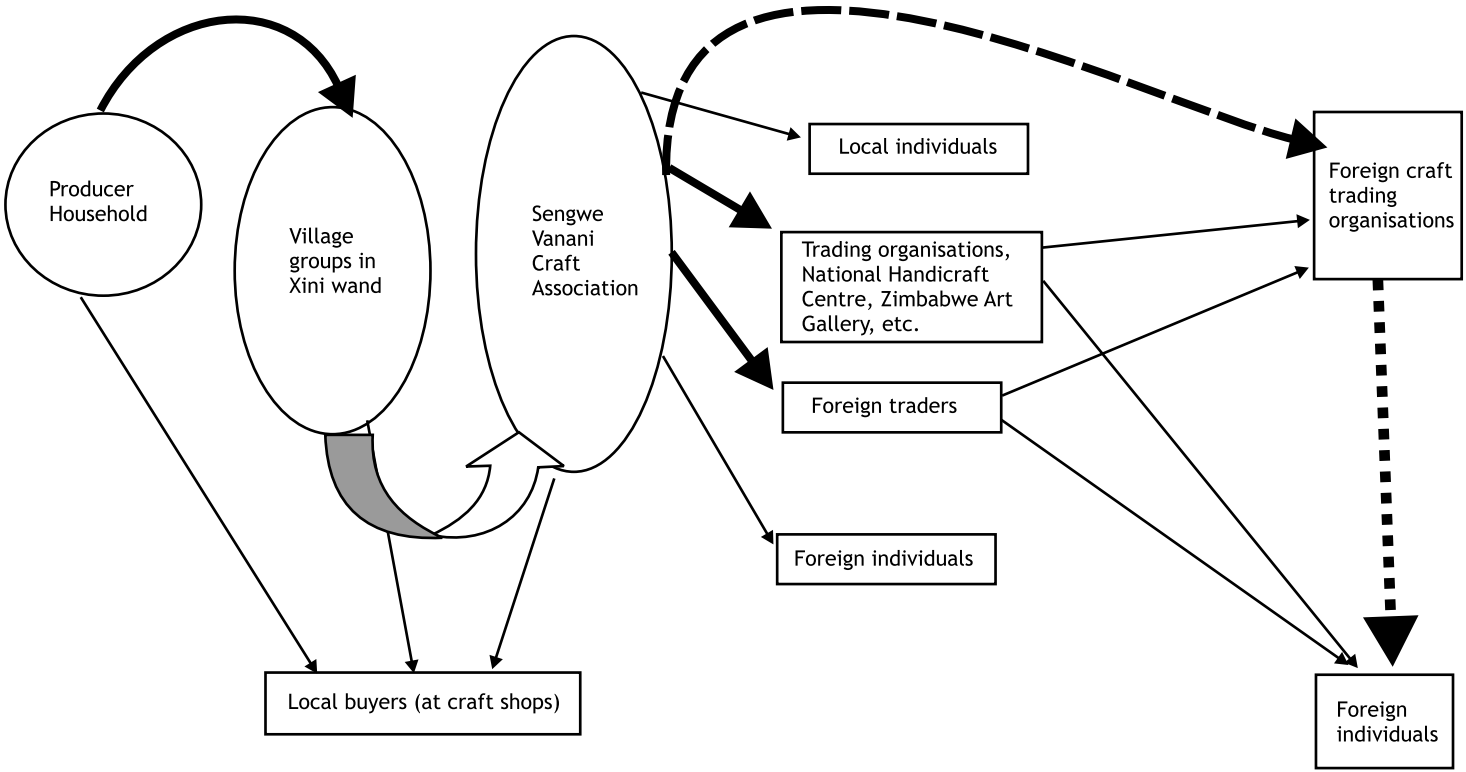


Table 3. Baskets production and income analysis

Stakeholder group and product	Producers (%)	Average production per producer household, 1998	Labour inputs (hours per item)	Market prices (US$ per item)	Average income per producer household, 1998 (US$)
Fruit baskets	40	14	12	1.45	6.37
Shopping baskets	32	6	16	1.82	3.64
Winnowing baskets	32	8	11	3.64	6.37
Overall		9.5		2.46	14.8

Policy framework

Government regulations influencing the production of crafts from palm leaves are enshrined in the Rural District Councils Act of 1988, Natural Resources Act chapter 20:13 of 1996 and most importantly the Communal Land Forest Produce Act chapter 19:04 of 1987 (Table 4). The Communal Land Forest Produce Act regulates the exploitation and protection of forest produce within communal lands. The act specifically permits the exploitation of these produces for household use and can only be commercialised through a permit or license. The permits or licenses are issued and monitored by the respective Rural District Councils (in this case the Chiredzi RDC) in consultation with the Forestry Commission. These regulations exist in theory but rarely has their effect been realised in the Sengwe area.

TRENDS AND ISSUES

SAFIRE and ENDA-Zimbabwe introduced financial, technical and institutional support to the Sengwe basketry industry. During the early to mid-1990s ENDA-Zimbabwe worked to promote commercialisation of palm products as well as infrastructural development in the form of marketing and administrative structures. The training subsequently provided focused mainly on product development, marketing and financial management.

SAFIRE moved into the area in the late 1990s providing institutional development support in terms of establishment of processors' organisational structures and natural resources management systems to ensure the sustainable utilisation of the palm. The linking of the Sengwe community to outside markets has resulted in a shift in craft production. In the early days this community used to produce big artefacts, which were easy to use in case there were no buyers. This scenario resulted in lots of craft ware piling up in houses and deteriorating beyond marketable standards. Now the community has organised marketing and produces on order. Most of these orders are for artefacts smaller than the traditional large utility baskets.

If the craft industry is to survive some management strategies should be employed to enhance, or at least maintain, the palm stocking levels. This was

Table 4. National regulations that affect the production of palms and the marketing of baskets

Regulation	Main Theme and Provision
1. Forest Act	Provides mandates for the Forestry Commission as a forestry authority to protect and conserve forests for the benefit of the nation—including control, management and leasing of state forests—and to regulate and supervise timber extraction by private landholders and concessionaires
2. Communal Land Forest Produce Act	• Restricts use of forest products in communal lands to own use • Provides for rural district councils (RDCs) to grant licenses to concessionaires to cut trees for commercial purposes • Restricts movement of produce from communal areas • Prohibits use of forest products from protected forest areas and reserved tree species • Prohibits removal of trees from within 100 m of riverbanks
3. Natural Resources Act	• Allows for the formation of Natural Resource Management Commit tees with powers to levy taxes and seek grants and loans • Empowers the Department of Natural Resources to monitor use of communal resources • Calls for clear quantification of costs in monetary and environmental terms for any development projects, limiting unnecessary clearing of woodlands in development projects
4. Communal Land Act	• Puts control of communal lands under the president through RDCs rather than traditional leaders • RDCs are allowed to develop land use plans that override customary land claims • RDCs are empowered to control cutting of trees • Provides for RDCs to grant permits to communities for the use of natural resources • Empowers RDCs to enact natural resources management by-laws
5. Rural District Councils' Act	• Provides for RDCs to enact by-laws to regulate natural resource use • Issues licenses for commercial extraction of wood products • Empowers natural resources management committees to enforce the Natural Resources Act • Makes RDCs responsible for long term planning and development
6. Traditional Leaders Act	• This new act with the objective of empowering traditional leaders to become custodians of natural resources, including land, is not yet fully understood and accepted

Source: Nhira *et al*. 1998.

already facilitated by SAFIRE through development of community resource management plans. The objectives of these plans are to balance resource utilisation and conservation through the enhancement of local control systems. However, the community still thought there were enough palm resources and enhancement mechanisms were unnecessary.

Palm utilisation regimes in Xini have shown that it is not so much resource ownership that is crucial for community-based industries to succeed but issues of access. In this community there were no indications of resource exploitation by non-owners. Population growth remains a key factor that influences the amount of palm resources available as it contributes directly to the rate of land use conversion to settlement and crop production.

CONSERVATION AND DEVELOPMENT: LESSONS FROM THE CASE

Resource base

Generally *H. petersiana* palms occur in large clusters scattered within the woodland. In terms of habitat disruption the harvesting process has caused very little change to the vegetation but impacts on the animal species should be evaluated. The area used to have more palm veld but because of land use conversion to crop fields most of it has been lost. As such the production-to-consumption system has not changed the palm resource status.

The people of Sengwe have always harvested young leaves for basket making and this has had no visible impact on the resource base. To date, both harvesting techniques and harvesting levels have resulted in no apparent impacts on palm leaf productivity. Because of this lack of visible impacts the people of Xini—and indeed Sengwe as a whole—have not embarked on any palm domestication strategies.

Craft processing

Before the advent of craft commercialisation people of Sengwe made big utility artifacts. The quality of products was poor and their range small. Production levels were also limited. Basketry was carried out as an off-agricultural season activity. Most of the products were piled up in houses in case buyers passed by. As such, selling was by chance. The advent of the basketry industry and improved market accessibility have resulted in increased craft production.

Market and trade

The formation of the marketing organisation SEVACA was undertaken to increase the processors' bargaining power. Before its formation individual basket producers negotiated their own prices, which led to exploitation even with the limited chance sale. SEVACA has facilitated penetration into distant markets where baskets are fetching relatively higher sales prices. Another apparent impact from the organisational structure of the processors was the increase in skills levels due to a number of training sessions offered for the production of specific and new types of baskets.

Sociocultural aspects

New social groups were forming across ethnic groupings and the impact of this is not known. However, it is envisaged that it would lead to social acceptance

and stability between the major groups, the Ndebele and the Shangaan. This social regrouping did not seem to affect cultural systems of palm utilisation but just might facilitate resource management by owners and nonowners.

CONCLUSION

The greatest threat to the basketry industry is land use conversion, which has reduced the palm standing stock, and hence also the harvestable material for basket making. Leaf harvesting techniques have not had any apparent adverse impacts as extraction rates are lower than annual leaf production rates.

The basketry industry, which began as chance sales by a few households, has grown to encompass about 60% of the households in the study area. The community based trading association SEVACA has facilitated the expansion of markets, thereby increasing community income so that the basketry industry now is contributing more to household income than it did before. This case study has demonstrated that with support community based industries can be viable.

ENDNOTES

1. Southern Alliance for Indigenous Resources,10 Lawson Avenue, Milton Park. Box BE 398, Belvedere, Harare, Zimbabwe. E-mail: sola@safire.co.zw
2. Exchange rate: US$1 = ZWD38.98.

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Chapter 15

The rattan industry in the Ashanti and Western regions of Ghana

Charles Adu-Anning[1]

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

ABSTRACT

This chapter presents the findings of a socio-economic analysis of the rattan industry in the Ashanti Region of Ghana. The study was carried out with particular emphasis on urban and peri-urban areas identified in previous research (Darko 1981; Falconer 1994; Oteng-Amoako and Obiri-Darko 2001) and was extended to the Western Region to analyse the raw rattan production system in view of the fact that almost all rattans being commercially utilised are from this region. The scope of the research covers the raw material production, processing and marketing subsectors of the rattan industry in Ghana. It was found that males dominate the ranks of producers and the majority of these have some level of formal education. The average income from rattan production is US$150 to US$200 per annum. Self-financing is the major source of capital funding for rattan producers. Suggestions and recommendations to promote the industry include the sustainable harvesting of wild sources of rattan, the establishment of plantations, increased availability of affordable sources of capital and the standardisation of quality grading rules.

INTRODUCTION

The rattan industry in Ghana is made up of a group of small scale entrepreneurs engaged in various activities from the production of raw rattan from either natural forest or fallow lands to manual processing of the rattan using simple tools into various products. The rattan industry is a major source of income for both rural and urban livelihoods (Falconer 1994; Townson 1995;

Holbech unpublished; Tabi-Gyansah 2001). The industry relies on the moist evergreen forests of the Western Region for the production of raw cane (Wong unpublished). Three main species provide the raw material for the commercial rattan sector: *Eremospatha macrocarpa* (mfia), *Laccosperma secundiflorum* (ayie) and *Calamus deerratus* (demmere) (Abbiw 1990; Oteng-Amoako and Obiri-Darko 2001). The production-to-consumption system for rattan in Ghana is complex and involves a number of stages from the raw material production to the sale of finished products. This is particularly the case because of the distance from the raw material production area (Western Region) to the major area of final consumption (Ashanti Region) and the socio-economic disparity between the regions.

METHODOLOGY

The approach

The production-to-consumption system approach concept was the framework adopted for conducting this study as defined by Belcher (1995) and Oteng-Amoako and Obiri-Darko (2001) as the entire chain of activities, from production of raw material through various stages of processing to finished products and marketing of the products to the consumer. The system includes the mechanisms involved in the technologies used to process the material as well as the sociopolitical and economic environments in which these processes operate.

Selection of study sites

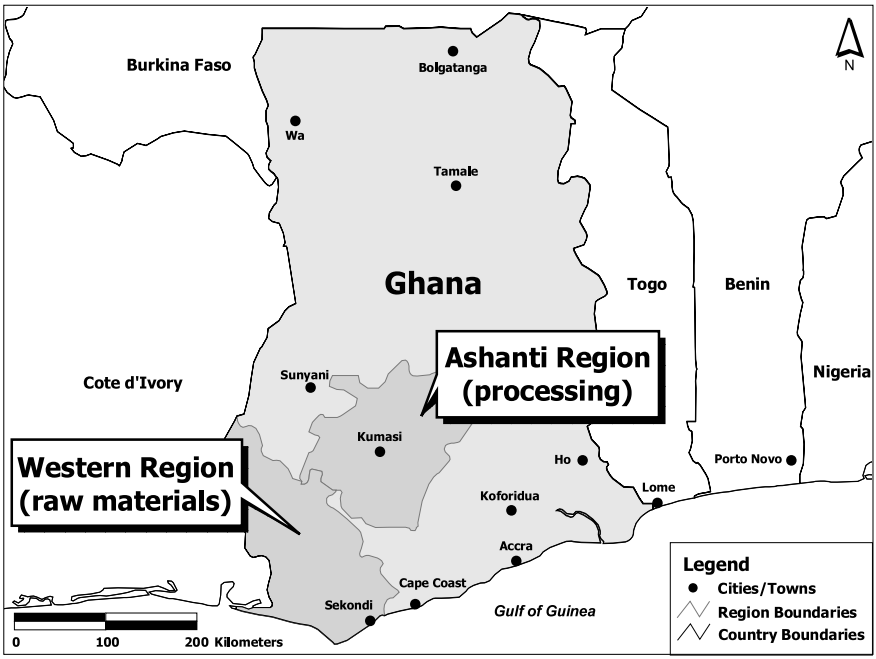
Surveys were confined to the Ashanti and Western regions of Ghana (Figure 1). They were conducted at various locations and concentrated on three main subsystems, i.e. collection and production, processing and manufacturing and marketing and trading. The raw material and the processing and marketing studies were confined to the Western and Ashanti regions respectively.

Data collection

Structured questionnaires were employed in gathering the necessary data on the rattan production-to-consumption system for both rural and urban surveys. The survey questionnaires were categorised into harvesting, processing and marketing of the rattans in selected areas in the Western and Ashanti regions. During the survey, rattan processing and trading centres in the Ashanti Region known to team members and those identified from past studies were visited and the processors and traders were interviewed.

Using the participatory rural appraisal methodology, focus and target group discussions were held with chiefs, producer groups and traders. In addition, structured questionnaires were also used to solicit information from individuals and households. The questionnaires centred on the general overview and development of the rattan industry with respect to raw material availability, processing capacities and marketing scenarios both locally and externally. Other areas include traditional rules, ownership rights, and rules and regulations

Figure 1. Map of the study area



Source: ESRI Data and Maps 2002.

on rattan exploitation. The discussion with Forest Service Division officials focussed mainly on regulations, taxes and the control of illegal activities. Additional discussions with personnel of the Ghana Export Promotion Council involved an assessment of the export potential of rattan products, business assistance and tax concessions for producers.

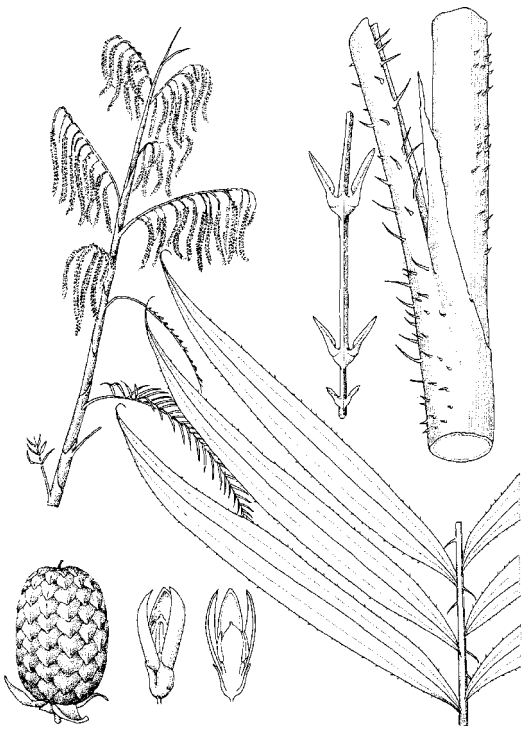
RAW MATERIAL PRODUCTION AREA

The raw material production areas are located in the south-western part of Ghana, in the 'wet' and 'moist evergreen' forest types (Foggie 1941; Hall and Swaine 1976). The annual rainfall of between 1,800 mm and 2,200 mm is the highest in Ghana (Quarshie-Sam *et al.* 1990). The soils are predominantly oxysols, few parts having a combination of oxysol and ochrosol. Hence these soils are highly acidic and poor in nutrients because of excessive leaching (Hall and Swaine 1976). The major occupation of the majority of the people of the area is farming, on both subsistence and commercial scales. Only 60% of the villages in the region have some form of access roads from the production sites to the marketing centres.

Harvesting of canes rattans

Rattan is harvested mainly from disturbed forest reserves, fallow lands and community forests. Collection for commercial purposes is undertaken

particularly in the dry season, when most roads are motorable. Small scale local weavers, however, harvest all year round as the quantity needed is small. They normally harvest when they go to work on their farms. In areas where the collection is undertaken there are no rattan plantations nor has there been any history of planting or cultivation. Since the outer bark, the sheath and the tips of the leaves are covered with thorns or spines the collection of cane is a difficult work. Harvesters begin the collection of rattan by severing the stems with a cutlass. After cutting and dragging the stems from the canopy, they are cleared of spines and leaves. The stems are then cut again to the desired merchantable length, which depends on the species, and packed into bundles of 50 to 80 pieces, again depending on the species, and transported to the roadside. The bundles are then further transported to the processing or marketing centres. Urban-based collectors usually undertake collection trips of up to 21 days. After collection the stems are stored and, when enough cane has been gathered, they are transported to the processing centres. Resource availability and accessibility of areas in the forest where rattan is growing are the most critical factors that determine the quantity of rattan harvested.

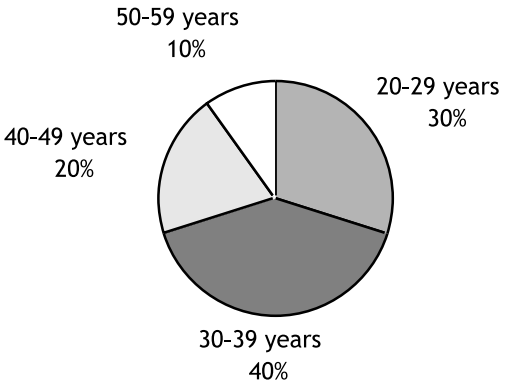


(Laccosperma secundiflorum)

Socio-economic characteristics of raw material production area

Because the process of rattan extraction is so labour intensive and has a high risk of accident and injuries, collection is a male dominated activity undertaken mainly by the youths of a community. Thus all of the raw material producers surveyed as part of this study were male, with the 40% plurality falling in the range of 30 to 39 years old (Figure 2). The average age is 38 years. Sixty per cent of the collectors have settled in the extraction areas after moving there from other parts of the country to engage in farming activities.

Figure 2. Age distribution of rattan collectors



Eighty per cent of the rattan collectors interviewed were middle school leavers, 5% have postsecondary education while 10% have primary education. The remaining 5% had no formal education (Figure 3). Rattan collectors are also involved in other income generating activities, namely farming, tailoring and carpentry. Table 1 shows the average incomes obtained from these endeavours.

Figure 3. Educational status of rattan collectors

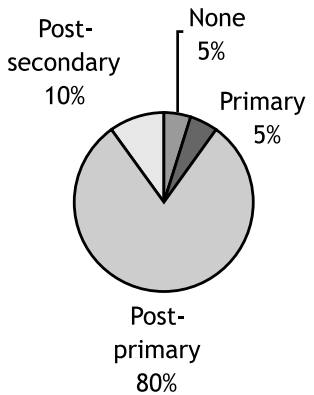
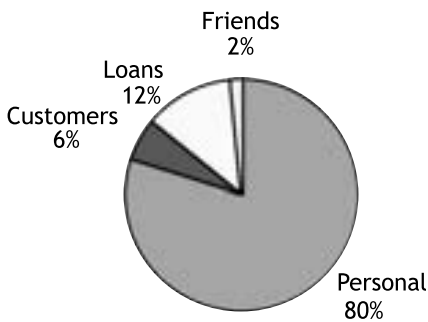


Table 1. Average gross income of collectors

Major occupation	Average gross income (US$)	Percentage of collectors
Carpentry	100	10
Business (trading)	100	200
Rattan production	150	30
Farm production	50	10

Our field surveys showed that around 80% of rattan collectors financed their collection activities from personal sources. Other sources of finance identified were customers (6%), friends or relatives (2%), and loans from money lenders (12%) (Figure 4). Loans from money leaders were the least sought after method of financing since interest rates were usually unbearable. Financial support from either government or any other formal organisation has never been obtained.

Figure 4. Sources of funding for rattan collection



PROCESSING AND MANUFACTURING

Freshly cut cane is highly susceptible to attack of staining fungi and to insect infestation. Ordinario (1973) noted that careful drying and treatment are important steps before its utilisation. The problem is aggravated when canes are not dried immediately or left in the forests for longer periods without any prophylactic treatment.

Harvested canes are dried for about seven days either directly on the ground or on a special frame raised above the ground to promote even drying, but our studies revealed 14 days as effective drying period. During the wet season, canes are dried over fire to ensure a faster rate of drying. Initial field drying of cane does not provide maximum protection since the moisture content of the canes is considerable and the relative humidity in the wet evergreen forest zone is usually extremely high. Therefore subsequent drying and treatment are essential to enhance durability and prevent staining and borer attacks. All harvested canes are allowed to dry before being stored and are best stored flat (large-diameter canes) or in broad loop (small-diameter canes).

The production processes and techniques employed differ little within the industry. Thus, the techniques used in Ghana can be grouped into the following processes (Page 1973; Oteng-Amoako and Obiri-Darko 2001).

- Raw material processing and storage of the cane in the form of either bundles or singles.
- Rough deglazing, or removal of the spiny leaf sheathes and hard, shiny, silicified epidermis.
- Machine room operations, whereby the stock from the rough deglaze is shaped or moulded into final dimensions through application of heat from liquefied petroleum gas stoves.
- Assembly, whereby all parts previously prepared are collected and assembled into final products. This section is equipped with jigs, clamps and fixtures.
- Finishing to enhance beauty and provide extra protection. The basic operations in furniture finishing are staining, colouring, painting, filling and sealing.

MARKETING AND TRADING

Two main types of rattan trading were identified, raw rattan and processed rattan trade. At the time of the surveys (2000) raw rattans were scarce and processors claimed they often had to fight over the few bundles that were available. They indicated that this scarcity had persisted for quite some time and that no one knew when the situation was going to improve. In this regard it is clear that the rattan resource is becoming depleted, which underscores the need for plantations to be established.

Raw rattan trade

Raw rattan is marketed in rural or urban markets in bundles of 25 to 40 sticks, usually being sold directly by a leader of the collection team. It is also supplied directly to processors either by order or under direct contract. The raw rattans are now in short supply and processors have to queue and fight for them. The cost of raw rattans is shown in Table 2.

Table 2. Cost of raw rattans

Species	Quantity	Amount (cedis)
Laccosperma secundiflorum	Bundle of 20 pieces	50,000
Eremospatha macrocarpa	Bundle of 80 pieces	50,000

US$1 = 6,550 cedis

Processed rattan trade

Finished products are marketed mostly in the urban centres. This trade involves the sale of products like furniture, laundry baskets, shopping and flower baskets, serving trays, dining sets etc. (Photos 1 and 2). The processors, based

on their own discretion, mostly determined the prices of these products. The export market for these products is not well defined.

The sale of processed rattan goods is highly dependent upon the season and the time of year. During Christmas, Easter and other religious holidays more products are bought than during ordinary days, and sales are better in the dry season than the wet seasons because during the latter access to raw materials becomes difficult.

Profit margins were slightly higher in the urban markets than the rural markets, the reason being that the standard of living is higher in urban areas than in rural areas. It was also because products sold in urban areas were better designed and had more value added with respect to chemical preservation and finishing than those generally found in rural areas. Carpenters in urban areas sometimes used some rattans to decorate part of their furniture, to add value and style.

Price setting

The pricing of products usually depends on the type of product, amount and cost of raw material used and the finishing of the products. The price of the product tends to be higher with improved finishing (Table 3), that is, similar products may have different prices depending on the processing and finishing technology used. No standardisation is done, and price variation among processors was almost nil. However, depending on the bargaining skills of a buyer and the economic position of processors a particular item may be sold lower than a similar item elsewhere.

Table 3. Prices for finished products

Product	Processing technology	Price in cedis
Living room furniture	Low	100,000
	Medium	120,000
	High	250,000
Dining set	Low	92,000
	Medium	100,000
	High	200,000
Laundry baskets	Low	6,000
	Medium	10,000
Baby's cot	Low	5,000
	Medium	7,000
Divider shelves	Low	20,000
	Medium	50,000

Photo 1. Rattan living room furniture and laundry baskets on display (Photo by C. Adu-Anning)

Photo 2. Processed rattan goods displayed for sale (Photo by C. Adu-Anning)

RULES AND REGULATIONS ON RATTAN PRODUCTION

Formal legislation

All members of communities in the immediate environs of a productive Forest Reserve have usufruct rights to collect small quantities of rattan from the reserve for domestic use. For the collection of commercial quantities, the interested party or persons should comply with the following procedures:

- Identify the area where rattan would be collected.
- Apply for permit by writing to District Forest Manager.
- Forest Services Division staff verifies availability of rattan at chosen area.
- Pay royalty and permit fee, the amount of which usually depends on species and quantity, number of trips and the ability of the collector. Fee collection is under the supervision of the Forest Services Division.
- The successful applicant receives an Insurance of Conveyance certificate valid for three days for the transport of collected rattan from one place to another.

Besides these formal requirements, a token fee in the form of cash (5,000-10,000 cedis) and/or a drink (schnapps) might also have to be paid to the traditional chief or council of the area before collection is undertaken. The amount varies from one area to another. However, indigenes and settlers of the area do not pay any of these traditional charges.

Rattan associations

The rattan producers have formed an association to which all producers are supposed to belong. Our survey indicated, however, that only about 50% of the producers interviewed belonged to the association. The association is to foster unity and good relation among members, control prices of raw rattan goods and to regulate rattan harvesting to protect the stock and ensure sustainable production from the natural forest. No local regulations or barriers were identified to prevent individuals' or households' involvement in the production of rattans. The only condition hinges on ability of the individual. Traders have formed associations that have been in existence for more than 70 years with a relatively high degree of participation of over 60%.

SUMMARY OF CONSTRAINTS OF THE RATTAN INDUSTRY

The following were the problems identified in the rattan sector:

- Depletion of the raw material base
- Expensive permit fees and royalties on rattan collection paid to the Ghana Forest Service Division
- Harassment of rattan collectors and processors by Forest Service staff in rural areas in the enforcement of permit fees
- Lack of appropriate area/land for processing
- Lack of standardised grading system
- Lack of suitable equipment

- Lack of proper preservation facilities
- Poor marketing facilities
- No showroom for exhibition of products
- Price fluctuations and irregular demand for products
- Poor processing techniques and inadequate working capital.

CONCLUSIONS AND RECOMMENDATIONS

The rattan industry constitutes a vital part of the industrial sector of the country. It contributes significantly to the development of Ghana's economy by providing employment and there is hope for an export market that could earn valuable foreign exchange if appropriate interventions were given to the industry.

The contribution of rattan to rural and urban livelihoods needs to be further recognised and appropriate solutions must be found to solve the existing problems as summarised above. The inadequacy of raw materials and the lack of working capital, basic equipment and technical expertise to operate the industry have adversely affected the production and quality of rattan products. With proper organisation of the processors and proper utilisation of the available support services, the rattan industry can be greatly improved (Oteng-Amoako and Obiri-Darko 2001). This study revealed that the sustainability of the industry depends largely upon the adequate supply of raw material and adherence to optimal exploitation rules. Against this background the following recommendations are made.

- The Resource Management Support Centre needs to look critically at the sustainability of the standing stock versus overexploitation.
- The Forestry Research Institute of Ghana must intensify research efforts in identifying the appropriate silvicultural and ecological conditions for the domestication of rattans.
- The Forest Services Division must establish rattan plantations and encourage rural-based individuals to do likewise.
- The Ministry of Tourism must provide a showroom and better processing sites for processors.
- Affordable and/or low interest sources of funds need to be made available.

ENDNOTES

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Chapter 16

The rattan sector of Rio Muni, Equatorial Guinea

Terry C.H. Sunderland[1], *Michael B. Balinga*[1] *and Mercy A. Dione*[2]

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

ABSTRACT

In Rio Muni, Equatorial Guinea, the harvest and sale of non-timber forest products plays a key role in the economic wellbeing of rural and urban populations (Marín and Cristóbal 1989; Sunderland and Obama 1999). One of the most economically valuable products currently traded is rattan cane (Sunderland 1998; Balinga and Dione 2000). Rattan is transported from the forest areas to supply a thriving cottage industry based in Bata, where relatively large quantities are transformed into a range of products. For many rural communities, the sale of raw cane as well as fabricated products provides invaluable access to the cash economy. In addition, the sector supports many urban artisans for whom rattan processing and transformation is the sole activity. However, the rattan sector is constrained by significant overharvesting, a direct result of rattan being an open-access resource and the lack of a management system, either customary or legislative, to control exploitation. This lack of regulation, and the corresponding mining of the wild resource, is leading to significant local scarcity in the immediate vicinity of Bata and is resulting in substantial price increases at the market level. There is an urgent need to develop sustainable strategies for the harvest of the wild rattan resource in order to supply the ever-growing market for rattan products.

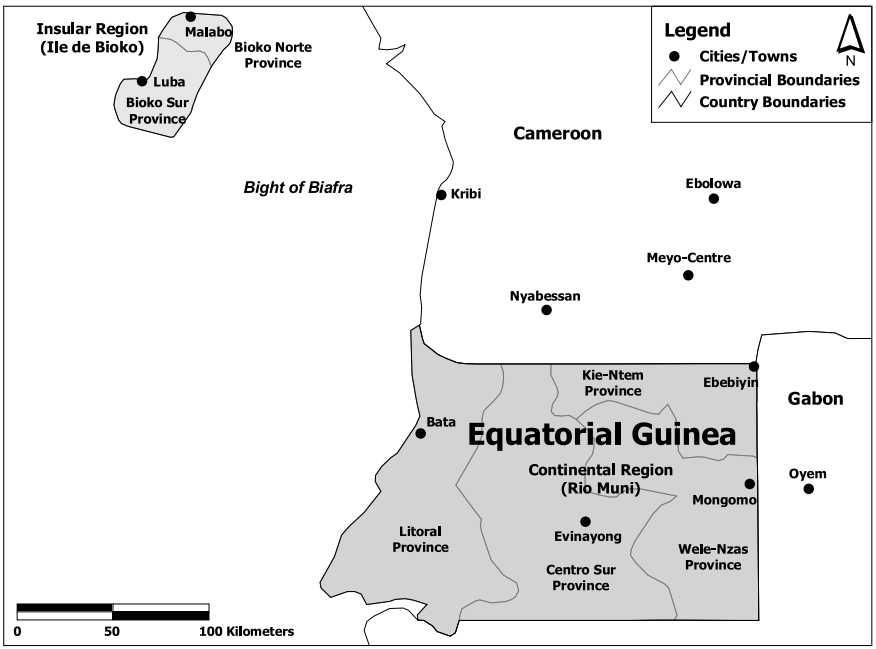
INTRODUCTION

Equatorial Guinea

The Republic of Equatorial Guinea consists of three diverse and disparate territories: the mainland territory of Rio Muni (26,017 km^2) and the islands of

Bioko (2,017 km^2) and Annobon (17 km^2) (Figure 1). The former Spanish colony gained independence in 1968, but the results of a tumultuous postcolonial era led to the country being classified as one of the poorest in Africa (Liniger-Gomez 1988). The recent discovery of large oil deposits, however, and the opening of the country to foreign timber exploiters has recently changed the fortunes of this relatively unknown African enclave and Equatorial Guinea is forecast to become one of the most prosperous countries in sub-Saharan Africa (Goldman 1998).

Figure 1. Map of Equatorial Guinea (excluding Annobon)



Source: ESRI Data and Maps 2002.

Equatorial Guinea's population of around 400,000 is composed of a number of tribal groups, which were formerly distributed along geographical lines. The Fang and the Ndowe originate from the Rio Muni region, the Bubis from the island of Bioko (Liniger-Gomez 1988). However, much migration by the Fang from the mainland has seen the Bubi become a minority on Bioko (Collel *et al*. 1994). Other Africans are also present in significant numbers in Equatorial Guinea, including Cameroonians (mostly Hausa traders), Nigerians, and Ghanaians as well as small numbers of people from Chad and Mali. The majority of these people are engaged in small-scale trading and business (Sunderland and Obama 1999).

The Rio Muni territory

The continental territory of Equatorial Guinea is a rectangular-shaped piece of land bordered on the west by the Atlantic Ocean, on the east and south by Gabon and on the north by Cameroon. It lies between 1°01' and 2°21'N with its eastern border following the meridian of 11°20'E. The territory has 222 km of coastline between the estuaries of Rio Muni at the southern end and Rio Campo (or Ntem) at the northern end. It is from the former that the territory derived its name.

The forested zone of Rio Muni was recently estimated to cover a total of 17,226 km^2 (van Breugel and Parren 1997) and is dominated by lowland forest (below 1,000 m). These forests are part of the Guineo-Congolian phytochorian and recent floristic investigations have shown them to be extremely diverse (Lisowski 1997). The interior of the mainland consists of a peneplain with an average altitude of 650 m, and is dominated by a number of protruding inselbergs, the highest of which, Monte Mitra, rises to 1,200 m (Guinea-Lopez 1946).

The lowland forest zone has been much affected in recent time by extensive logging. Timber exploitation was first undertaken in the coastal regionsand, as techniques improved, the practice spread further into the interior (van Breugel and Parren 1997). Today, much of the mainland territory has been logged or is currently under concession (Stenmanns personal communication) despite a proposed network of protected areas (Garcia and Eneme 1997), and selective logging represents the major land use of the territory. Some agricultural plantations of oil palm and rubber are maintained on the coastal plain and some cocoa plantations have long been established along the border with Cameroon. Small-scale agriculture is also widely encountered in the coastal region, but the relatively small population militates against this land use being a major factor in forest conversion (Serrano 1997).

Rattans are one of the most important non-timber forest products (NTFP) of the continental region of Equatorial Guinea and play an integral part in indigenous subsistence strategies (Sunderland 1998; Balinga and Dione 2000). Rattan products also form the basis of a thriving cottage industry centred in Bata producing large quantities of chairs, tables and other household items for sale as well as export to Malabo (*ibid.*). This trade has grown dramatically in recent years as a result of the increasing number of expatriates arriving to work in the region. In addition, cane furniture has also become fashionable with Guineans and residents from other African countries.

The resource base: rattan species utilised in Rio Muni

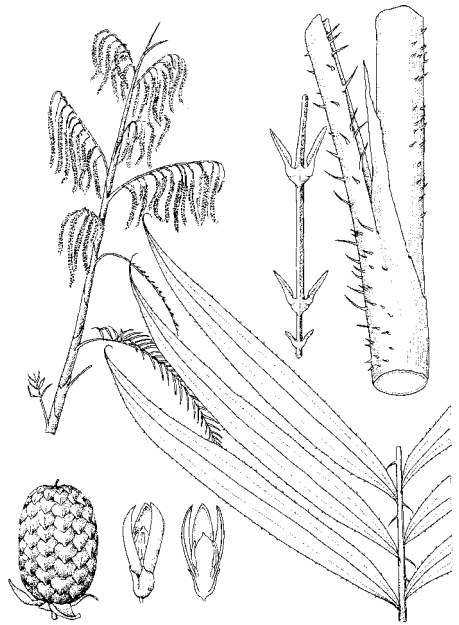
In Rio Muni, mainly three rattan species are collected in the forest for processing and sale. These are the large diameter canes *Laccosperma secundiflorum* (P. Beauv.) Kuntze and *L. robustum* (Burr.) J. Dransf. (*nkan* or *aka*), used whole for furniture framework and split for coarse basketry, and the juvenile stems of the small diameter cane, *Eremospatha macrocarpa* (G. Mann & H. Wendl.) H. Wendl. (*nlong*). These species provide the resource base of the rattan industry in the country. Despite the heavy reliance of the rattan artisan sector on these three species, other species are also sometimes traded and utilised, and a number of artisans recognise the use of other species of cane (see Table 1).

Table 1. The rattans of Equatorial Guinea and their use

Species	Fang name	Use	Notes
Calamus deërratus G. Mann & H. Wendl.	*nding*	Unknown	
Laccosperma secundiflorum (P. Beauv.) Kuntze	*aka, nkan, meka*	Cane used as furniture framework (whole stems); split stems used in coarse basketry, e.g., farm baskets (*nkueiñ*), fish baskets (*bidong*), fish traps (*bekoro*) and bridge construction; rachis used as fishing rod; young leaves eaten in stews; palm heart eaten	The most important cane species, widely used on a subsistence level and forms the basis of the commercial cane industry throughout West and Central Africa
L. robustum (Burr.) J. Dransf.	as above	as above	as above
L. acutiflorum (Becc.) J. Dransf.	*ekwassa*	Sometimes used in coarse basketry as a substitute for *L. secundiflorum*	Despite the morphological similarity to *L. secundiflorum*, this cane is not widely used as it is considered too inflexible
L. laeve (G. Mann & H. Wendl.) H. Wendl.	*ndele*	Some minor tying and basketry in forest	
L. opacum (G. Mann & H. Wendl.) Drude	*npue-nkan*	Some minor tying and basketry in forest	
Eremospatha macrocarpa (G. Mann & H. Wendl.) H. Wendl.	*asa-nlong, melong, ongam*	Juvenile stems split and widely used for baskets, weaving, furniture tying	Second most important cane species; commercially exploited; is not used in the adult state (*ongam*) as it is considered too inflexible
E. laurentii De Wild.	*ebuat*	Use not recorded	
E. wendlandiana Dammer ex Becc.	*akot*	Stem split and used for tying roof panels of *Raphia hookeri* leaves	
E. cuspidata (G. Mann & H. Wendl.) H. Wendl.	*ndera*	Use not recorded	
E. hookeri (G. Mann & H. Wendl.) H. Wendl.	*alua-nlong*	Use not recorded	
Oncocalamus mannii (H. Wendl.) H. Wendl.	*asa-nlong, melong, ndoro*	Juvenile stems used in the same way as *Eremospatha macrocarpa*, although on a much lesser scale as the stems are rather weak and inflexible	Often confused with *Eremospatha macrocarpa* in the juvenile form (hence same names) but varies by having stem armed with black triangular spines
Oncocalamus macrospathus Burr.	*?*	Unknown	

Source: modified from Sunderland 1998.

The majority of rattan species in Africa, particularly those of commercial value, occur in closed tropical forest and are gap colonisers. Any significant increase in forest disturbance, such as through selective logging activities, encourages the regeneration of rattans. With large areas under timber concession in the Rio Muni region it is unlikely that any of the three commercial species, in the regional context, can be considered at risk of depletion. However, because of the current exploitation level and its impact on the regeneration of the species concerned (see below), there is considerable evidence of increasing local scarcity, particularly within the forest areas around Bata. Without exception, the rattan harvested in the Rio Muni region comes from the wild. There are currently no prospects for the development of cultivated sources of cane.



(Laccosperma secundiflorum)

THE PRODUCTION-TO-CONSUMPTION SYSTEM

Raw material production area

The main areas of rattan exploitation to supply the markets of Bata with raw cane are listed in Table 2. Essentially the forested area throughout the mainland supplies this thriving market and bundles of cane are often transported large distances (up to 165 km). The area comprises an intricate mosaic of logged forest and agricultural fallow, as well as the large protected area of Mont Alen National Park, which is also a major source of rattan cane.

Table 2. Major supply zones for raw cane to Bata

Settlement	Province	District	Approximate distance from Bata (km)
Amvam	Kie-Ntem	Micomisseng	100
Ayamiken	Litoral	Bata	40
Bibin	Litoral	Bata	43
Efulan	Litoral	Bata	34
Elong-long	Litoral	Bata	25
Eyamnyong	Litoral	Bata	30
Machinda	Litoral	Bata	34
Mbam	Kie-Ntem	Micomisseng	135
Mboete	Litoral	Bata	41
Mocomo	Litoral	Bata	16
Mongo Onvang	Centro Sur	Niefang	66
Mowomo	Litoral	Bata	36
Ncoekie	Litoral	Bata	21
Ncoe-kue	Litoral	Bata	38
Ncoomidji	Litoral	Bata	57
Ndogo	Litoral	Bata	13
Ngouba I	Litoral	Bata	19
Niefang	Centro Sur	Niefang	77
Nkue	Kie-Ntem	Micomisseng	110
Micomisseng	Kie-Ntem	Micomisseng	165

Raw material producers and the socio-economic context

Introduction

The rattan sector of Rio Muni comprises four major activities: harvesting, transportation, processing and consumption. There is no central trading point and trade in raw cane is limited to harvesters selling directly to artisans. In general, two major systems can be identified; harvest and transformation at the rural (village) and the urban levels. However, the final consumption point for both rurally produced and urban manufactured products is Bata.

Village-based harvesting and transformation

In general, village-based harvesting and transformation of rattan is undertaken almost exclusively by men above 35 years of age, but women are sometimes involved in the small-scale fabrication of temporary market baskets. For many in the rural milieu, the fabrication of rattan products is more often a secondary activity and is undertaken towards the end of the day when the primary activity, commonly agriculture, is completed.

Most cane is harvested whilst the men are outside the village on their farm business, and each day most will return with a small quantity of cane. Some of the older men of the village receive the help of their sons or other family members to collect cane or, more commonly, the younger men are simply sent to the forest to collect in times of need. In general, each village in the raw material production area has one or more local artisans who provide rattan products for the rest of the village, particularly the ubiquitous ‘easy chairs’.

Although some rattan products are bartered locally for traditional medicines or other household items, the majority of these products are exhibited at the roadside and sold directly or are transported in bulk to Bata for sale. Although farm baskets (*nkueiñ*), and other consumable items are fabricated for use within the household, there is a roadside trade in these products as well. The *nkueiñ* baskets in particular are very well fabricated and are commonly exported by sea in large quantities for sale in Malabo.

The majority of village-based harvesters complain that they are forced to travel further and further into the forest in order to obtain a good quantity of cane (Sunderland 1998). Over time overharvesting and the expansion of the village agricultural area have caused shortages of raw cane in the immediate vicinity of most villages. The average distance of travel to find rattan from most villages is 5 km and, in many cases, people complain that it is becoming too great a distance to be worth their while (Balinga and Dione 2000). A considerable number of village-based harvesters cut and harvest cane to order for well-established urban artisans. This activity is discussed in more detail below.

Photo 1. Harvesting rattan in closed-canopy forest (Photo by T.C.H. Sunderland)

Urban-based harvesting and transformation

There are around 20 to 25 rattan artisan workshops in Bata ranging in size from one-man operations to large workshops employing up to 20 artisans. All are privately owned. They produce a wide range of rattan products, mainly concentrating on furniture and other household items. All of these workshops rely on a regular supply of raw cane from the forest. Most urban-based artisans are supplied with cane directly from village-based harvesters, but a few artisans sometimes go to the forest themselves to collect cane, particularly in time of high demand. No unsolicited cane comes from the forest for sale in Bata. Rattan is not traded in the market in the same way as other NTFP, i.e., in central markets, and there exists a close and loyal relationship between harvesters and artisans, who are usually extended family members. Almost without exception, harvesters and artisans are male and, aside from the village-based weaving of market baskets by some women traders, the rattan sector in Rio Muni is dominated by men.

The unit of trade for commercial cane is the 'packet'. For the large diameter cane species such as *Laccosperma secundiflorum* and *L. robustum*, a packet represents 20 stems, with each stem being 3 m to 4 m in length. For the small diameter cane *Eremospatha macrocarpa* a packet equals 20 stems of 5 m length. In general, however, the harvester is paid per stem and, depending on quality, a stem of either species is worth CFA100 (US$0.75)[3]. For very large diameter stems of *Laccosperma secundiflorum* the price per stem is double that amount. Artisans based in Bata pay the harvesters directly for the cane on delivery. The price includes all transport costs and any associated costs (police 'taxes' etc.).

The processing industry

The degree of transformation of rattan from raw cane to finished product can probably be best described as rudimentary. Raw cane arriving from the forest needs a good deal of preparation before it can be utilised for furniture production. Although during harvesting some of the spiny sheath is removed this is more to facilitate handling, and much of the outer leaf sheath remains. On arrival at the workshop this sheath is removed with a small knife and the epidermis is systematically scraped away to leave the clean, workable cane beneath. Stems are then left to dry for two (dry season) or three days (rainy season). This process is the same for both species of large-diameter cane, whereas the scraping and splitting of small diameter cane occurs during the fabrication process.

Once it is dry, large diameter cane has unfortunately lost some of its flexibility. In order to facilitate manipulation of the cane into the desired framework, it is bent using heat supplied from a blowtorch. Often a bench with a specific jiglike 'bending tool' is also employed, with most artisans fabricating their own. Some artisans do not like the black scorch marks that the use of the blowtorch produces and prefer to bend the cane to shape whilst the leaf sheaths are still in place. Subsequent cleaning of the cane removes the scorch marks, although the cleaning process is a little more difficult because by then the sheaths are rather dry and persistent.

The processing of rattan from raw cane to finished product is extremely labour intensive and, as such, represents the highest cost input into the transformation of raw cane. Although some of these costs are offset by the use of 'apprentices'[4], they remain high. It is unknown what proportion of these labour costs, or the value of raw cane, is reflected in the costs of the finished product.

The rattan processing units operating in Rio Muni are often of low technology and operate either outdoors or in open workshops with a simple roofed covering. All artisans in Bata are male and most are under the age of 40. The older men in the business are responsible for the design and production of the furniture and, generally, the apprentices provide labour for the laborious task of cleaning and preparing raw cane for production as well as basic weaving and other time-consuming activities. Almost without exception the artisans of Bata are Fang in origin; it is suggested that the Ndowe do not have a tradition of rattan artisan work beyond the production of fish traps, baskets and other subsistence use.

The quality of the finished rattan products varied widely between artisans. In Bata the quality is generally relatively high and compares favourably with rattan production in both Cameroon and Nigeria, often surpassing it. However, many artisans use far too many nails instead of binding a joint with flexible cane and many rely to heavily on the use of the blowtorch for bending the cane, often leaving unsightly scorch marks on the finished product. The best quality finished products are found at the Societe Artisanal de Guinea Ecuatorial workshop in Bata and the formerly Ecologie & Conservation de la Forestiers d'Afrique Centrale–funded workshop at Mont Alen. The furniture produced by both these concerns is undoubtedly of export quality and the designs are compatible with the known market demands of Europe and North America.

Trade and marketing

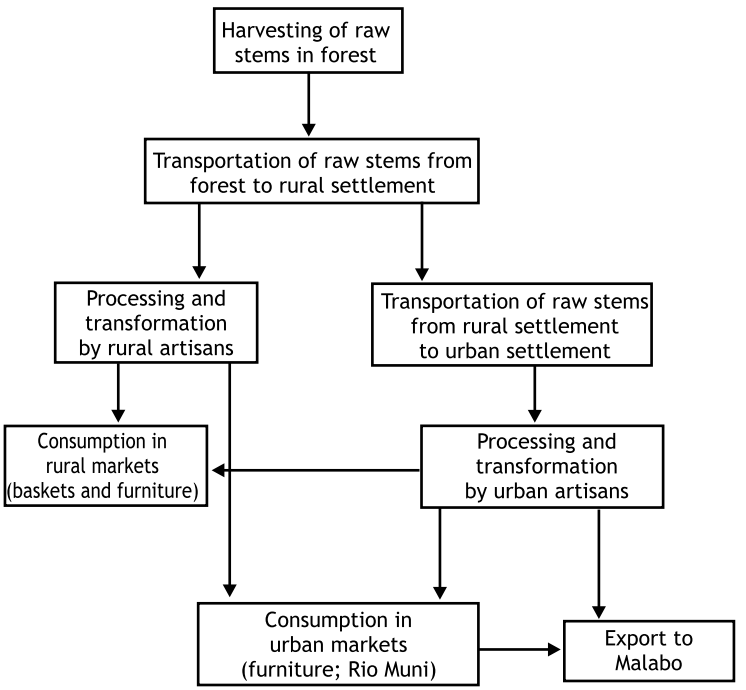
The ways in which rattan moves from the forest to the final consumer are described above. The production-to-consumption system is summarised in Figure 2.

The rattan market in Equatorial Guinea is long established and probably dates from the beginning of the twentieth century (Liniger-Gomez 1988). During the period of isolationist government during the 1970s forest products, such as rattan, were much relied upon to provide for the majority of household needs and the markets expanded rapidly during this period.

The rattan market is currently continuing to expand, due to the influx of expatriates now working in Bata. Almost without exception, the artisans in Bata state that the use of rattan is increasing and much greater amounts of cane are being processed in Bata today than was being worked 5 or 10 years ago. Customers are from a wide variety of ethnic origins. Many Bata-based artisans established their business for the expatriate market but today many Guineans and other African nationals purchase rattan products. They are no longer regarded as "poor man's furniture" but have become rather en vogue, particularly among the growing middle-class. More recently, it has also been reported that a substantial, and as yet unquantified, proportion of finished furniture is shipped from Bata to the capital city of Malabo as the island of Bioko has no rattan resource of its own (Obama personal communication).

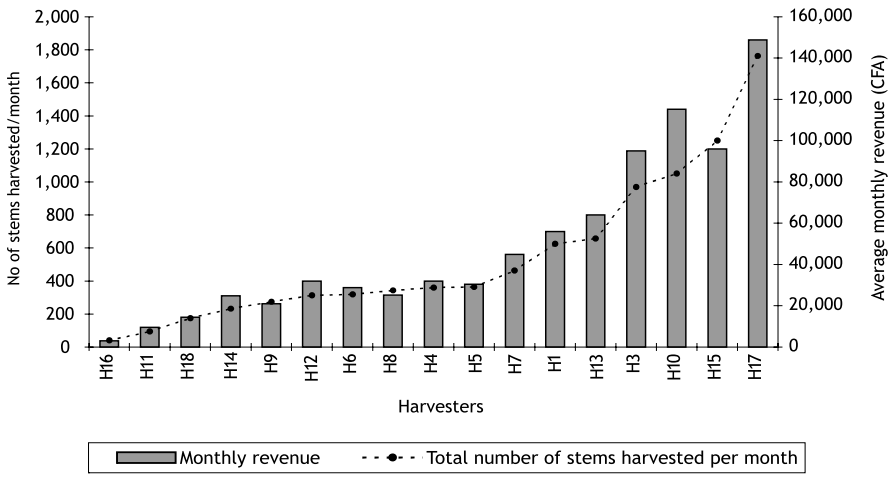
Photo 2. Fabricated chairs for sale in Bata (Photo by T.C.H. Sunderland)

Figure 2. Production-to-consumption system of the rattan trade in Rio Muni



In comparison with other forms of natural resource utilisation, the rattan sector in Rio Muni is highly profitable, surpassed only by the bushmeat trade (Garcia and Eneme 1997). It is an activity that requires little capital investment and, as such, the profit margins are relatively high—between CFA20,000 and CFA170,000 (US$27–US$200) per month. The harvest and sale of raw cane and finished products is a means for many rural communities to enter the cash economy, particularly in times of need, such as when school fees are due, medical emergencies arise, or holiday expenses occur. Although there are seasonal fluctuations in sales, the urban cane business remains highly profitable while supplies of raw cane are available (Sunderland 1998; Balinga and Dione 2000) (Figure 3).

Figure 3. Variation of averages for monthly revenue and total monthly output per harvester/artisan



POLICY ENVIRONMENT

Customary laws and controls

In the Rio Muni region, as is the case throughout Africa, rattan is an open-access resource and as such is affected by neither customary law nor resource tenure issues. Generally, harvesters collect cane from the same area of forest. On each visit, the village chief is paid a small levy either in cash (often equivalent to US$1.40–US$2.50) or in kind for access to the forest. This system of access applies whether the harvester is native to the village or an outsider. The lack of resource tenure is the largest hindrance to the sustainable management of the rattan resource in Equatorial Guinea; there are few controls to access to the resource or the manner in which it is harvested.

Legislation and government interventions

There is currently no direct government investment or intervention in the rattan sector of Equatorial Guinea. The 1997 Appendix to the 1995 Forestry Law of Equatorial Guinea (Reglamento de Applicacion de la Ley Sobre el Uso y Manejo de los Bosques EQG/96/002) makes reference to the sustainable management of commercially exploited NTFP such as *Prunus africana* and *Piper guineensis* (Articulo 62°). However, no provision is made in this legislation for the management of the rattan resource. Because of this, very little formal revenue is realised from the trade in raw cane and finished products. 'Informal taxation', however, is often paid to forestry officials and members of the police and armed forces who intercept the loads of rattan as they are transported. Both artisans and harvesters state that this is an accepted, if frustrating, aspect of their involvement in the sector.

Formal taxation

In addition to the payment of informal taxation by rattan harvesters and transporters, urban-based artisans are expected to pay the following fees.

Ministry of Tourism and Information	CFA12,000–CFA25,000 (US$16–US$34) per annum
Ministry of Forests and Environment	CFA12,000–CFA35,000 (US$16–US$47) per annum
Town Council	CFA12,000 (US$16) per annum
Ministry of Economy	CFA15,000 (US$20) per annum

The level of the fee to be paid is determined according to the physical size and estimated output of each workshop; larger workshops pay more to the Ministries of Tourism and Forests than smaller ones.

Rattan unions

Currently, there is no organisation or union of rattan harvesters and/or artisans in Equatorial Guinea. However, the need for such an organisation was expressed by the artisans interviewed both by Sunderland (1998) and Balinga and Dione (2000). To date no initiatives have been taken to address the lack of organisation amongst both harvesters and artisans.

TRENDS AND ISSUES

The resource base

All of the 22 species of rattan that are distributed throughout the African lowland tropical forest are clustering species, that is, they produce multiple stems from a single rootstock (Sunderland 2001). In theory this morphological advantage suggests that sustainable harvesting through good 'stool management' should be possible. However, due to insecure resource tenure, the clumps are often indiscriminately destroyed by harvesters who cut all of the stems within a clump, not only the mature ones. The resultant regeneration, if it occurs, is extremely

slow, suggesting to exploiters that harvest cycles are too long to be worth developing. In addition, the large diameter species of cane, *L. secundiflorum* and *L. robustum*, are hapaxanthic (Sunderland 2002), which means that they exhibit an extremely long vegetative phase before a reproductive event. As harvesting often occurs before inflorescences, and subsequently seeds, can develop, the regeneration potential of the species is deleteriously affected.

Without adequate resource tenure and corresponding management systems for rattan exploitation, coupled with the ecology of the species concerned, indiscriminate harvesting is affecting both present and future supplies of raw cane. Almost without exception, all of the harvesters interviewed by Sunderland (1998) and Balinga and Dione (2000) lament the fact that they are forced to travel farther into the forest to obtain sufficient quantities of raw cane. This is a strong indication that supplies are diminishing. Further evidence at the market level suggests that the additional transport and opportunity costs of harvesting farther away from the urban markets is slowly resulting in corresponding price increases, both of raw cane and finished products[5].

In addition to direct overexploitation, agricultural expansion is also deleteriously affecting the rattan resource base. The stems are often cut during farm clearance operations and the whole clump is then destroyed during the subsequent burning. In this regard, the production of food crops is given a higher priority than the rattan resource, despite its economic value.

The trade

There are strong indications that the market for rattan products is increasing owing to the recent influx of expatriates to Malabo in particular, but also to Bata, and the emergence of an Equato-Guinean middle-class as a direct result of the oil boom in the country. It is these urban dwellers that are now purchasing the better quality rattan products, which have become somewhat fashionable. However, demand often outstrips supply and there are periods during the year when raw cane is difficult to obtain in Bata. These periods correspond with the early rains, when most rural harvesters are more concerned with planting food crops than harvesting cane, and during the latter part of the rainy season, when transportation is extremely difficult because of poor road conditions.

Livelihoods

The increased demand for rattan products is leading to increased profits for most urban artisans and most report that they have a better standard of living today than previously. However, despite the high profit margins the sector is constrained by scarcity of raw material supplies. In the rural milieu rattan harvest and sale provides access to the cash economy at times of need for many households and, in the absence of other income generating activities, rattan continues to provide this much-needed source of revenue. However, the increased opportunity costs of collecting rattan from far inside the forest are discouraging a number of harvesters from continuing in the sector. With fewer harvesters actively collecting, supplies to both the urban and rural artisans are further affected.

Development interventions

With very little government involvement in the rattan sector in Equatorial Guinea there is likewise a corresponding paucity of outside development interventions in the sector. However, the establishment of a community-run transformation unit at Mont Alen is a notable exception to this. In addition, the European Union also commissioned a study of the rattan sector in Rio Muni with a view to developing the sector through the CUREF (Proyecto Conservacion y Utilizacion Recional de los Ecosystemas Forestales) project based in Bata (Sunderland 1998). However, the project completed its operations before the recommendations of the report could be implemented.

CONSERVATION AND DEVELOPMENT LESSONS OF RATTAN HARVESTING IN RIO MUNI

Unquestionably, the present systems of rattan exploitation practised in Rio Muni are unsustainable. Removal of all of the individual stems within a cluster, coupled with removal of mature stems prior to them having a sexually reproductive event, is affecting the regeneration of rattan populations where they are harvested. This poor management and lack of recruitment is contributing significantly to local resource scarcity. This scarcity is further exacerbated by land clearance for agriculture, whereby individual clumps are burned and destroyed.

Although in theory it is feasible that a rotational harvest system for removing selected mature stems within a clump, leaving immature stems to develop and grow, could be developed, the lack of tenure for the rattan resource precludes any attempt at developing sustainable community-based management strategies. There is no immediate prospect of this situation changing either from the perspective of increased customary control or from formal forestry legislation. The rattan sector in Rio Muni is now faced with the problem of overexploitation, which is leading to considerable scarcity and corresponding price increases at the market level. Yet demand for rattan products continues to grow. In this regard, the prospect of far more serious shortages for the urban artisan seems an inevitability. There is some scope, however, for developing cultivated sources of supply for rattan to make up for the shortfall in future supplies and better forest management regimes aimed at regulating harvest cycles would be an appropriate means to ensure sustainability.

It is clear that rattan in Rio Muni plays a significant role in the economies of both rural and urban households and enables a considerable number of rural harvesters to enter the formal cash economy. Whilst the resource is harvested in an unsustainable manner, the benefits of the rattan sector to the livelihoods of those involved are considerable, and evidence of this is provided by the increase in the number of artisans in Bata in recent years. However, and despite the poor levels of processing and transformation technology, it is this very profitability that is leading to the overexploitation of the rattan resource.

SUMMARY AND CONCLUSIONS

The initial study of the rattan sector in Equatorial Guinea (Sunderland 1998) was stimulated by the realisation that the NTFP sector contributed significantly to both rural and urban incomes. In particular, rattan was identified as being

one of these key NTFP resources. The key findings of this study and those of a subsequent study by Balinga and Dione (2000) are summarised below:

- Rattans, in particular the species *Laccosperma secundiflorum*, *L. robustum* and *Eremospatha macrocarpa,* comprise one of the most important NTFP resources of the Rio Muni region of Equatorial Guinea at both the village level and in terms of commercial activity (Sunderland 1998; Sunderland and Obama 1999). Their economic importance at the household level is probably surpassed only by bushmeat (Garcia and Eneme 1997).
- Rattan harvesting and processing is almost exclusively a male occupation with younger men (under age 35) being more involved at the commercial level and older men (aged 35 or over) at the village level.
- At the village level, rattan transformation is a secondary activity, the primary activity being agriculture.
- Large quantities of raw cane enter Bata, which are being converted into finished rattan products. This trade is extremely profitable, with low overheads and high marketing margins on finished items.
- There has been an increase in the demand for rattan products in the past 5 to 10 years and many new artisans have established themselves in Bata.
- The majority of the raw cane entering Bata is harvested in the immediate environs of the town, but some harvesters have complained of scarcity due to overharvesting and are having to travel farther away to obtain sufficient quantities of cane.
- The destructive and wasteful harvesting practices often employed by most harvesters do not allow for the majority of clumps to regenerate adequately for subsequent harvests. This is also causing local scarcity of cane supplies.
- Because the rattan resource is considered an open access resource and hence customary laws with regard to land and resource tenure do not apply, poor resource management ensues.

In conclusion, the major problem of the rattan sector in Rio Muni is that the high demand and value of the product itself is leading to overexploitation. The problem is exacerbated by a total lack of management and control of the resource. Interventions aimed at improving the availability of the resource base, both through better natural resource management and possibly through the introduction of cultivated systems, need to be developed. Policy interventions aimed at encouraging the sustainability of the rattan resource should also be encouraged.

ENDNOTES

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3. Exchange rate in May 1998: US$1 = CFA600.

4. Many artisans have apprentices, ostensibly to train them. In reality, however, the apprentice undertakes much of the tedious work of cleaning the raw cane ready for transformation. The apprentice's parents usually pay the artisan for the training.

5. This is evident from the data on the change in product prices collected by Sunderland (1998) and Balinga and Dione (2000), which show significant price increases both for raw cane and for 'standard' finished products.

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Chapter 17

Rattan exploitation in the Yaoundé Region of Cameroon

Louis Defo[1]

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

ABSTRACT

From 1996 to 2000 intensive investigations based on observations, surveys, interviews and the use of standardised questionnaires were carried out in the rattan sector in the Yaoundé region in Cameroon. The following data could be summarised from this research:

a. Rattan (mainly *Eremospatha macrocarpa* and *Laccosperma secundiflorum* and *Laccosperma robustum*) constitutes the most prized non-timber forest products in the villages concerned and assumes an undeniable economic, social and cultural importance. In the village production system, it ranks second only after agriculture.
b. The exploitation of rattan is based exclusively on natural stands and is not undertaken in a sustainable manner. This resource, access to which is easy and free, is being subjected to considerable pressures. All this is detrimental to its productive potential. This situation is partly attributable to the inadequate and summary nature of the regulation.
c. Rattan is collected in the region mostly by young men, who process it on the spot in villages or sell (the greatest part) of it in the unprocessed state directly to craftsmen in Yaoundé. The conjunction of several factors has led to an appreciable increase in the number of processing units and the volume of rattan supply in this city in the course of the last few years.
d. Rattan processing in Yaoundé is operated in a rudimentary manner by about 100 small-scale enterprises run almost entirely by men. The output of these processing units is of average or mediocre quality. It is sold almost exclusively in the domestic market.

e. The profit margins of the main participants in the sector are far from being negligible in the local context. The impact of rattan-related activities on the lives of the persons concerned is positive. It could be even more positive if the conditions for an increased and rational development of this high value non-timber forest product were created.
f. The rattan production-to-consumption system in Yaoundé region is limited and poorly articulated. The vertical relationships among its components are loose (weak integration of some components of the channel) and its horizontal links are practically non-existent (lack of credible organisations among actors).

INTRODUCTION

Tropical forest space management currently holds a place of choice in the concerns related to natural resources and to the environment. Before the beginning of the 1990s, however, concerns about the sustainable management of tropical forests in general were disproportionately partial to timber or wood, whereas other forest resources were considered as 'minor' products (Falconer 1990; FAO 1993). This lack of attention with regard to non-timber forest products (NTFPs) is nevertheless still persisting in some countries while pressures to which they are subjected is ever-increasing as a result of deforestation and increased commercial exploitation (Falconer 1990; Peters 1997).

Rattan is indisputably one of the most important NTFPs in the world (Panayotou 1990; Dransfield and Manokaran 1994; Sastry 2001) and that is without doubt one of the reasons for which it has drawn the attention of researchers. Many studies have thus been devoted to rattan, especially to its biology, ecology, cultivation, exploitation, processing and marketing. These studies are concentrated almost exclusively on Asia (see for example Bacillieri and Appanah 1999; Sastry 2001; Baja-Lapis *et al.* undated) since African rattan has retained very little attention. However, considerable efforts have been devoted to research on rattan in Africa during the past decade (see for example Sunderland and Profizi 2003).

Yet, people in the African forest area have for a long time taken an interest in this liana. For example, the Ewondos and related people in the region of Yaoundé in Cameroon have a long-standing tradition of rattan utilisation. Indeed, since they settled in the equatorial forest zone in the nineteenth century (Mveng 1963, 1985), these people have integrated the use of rattan in various aspects of their lives: building huts, making objects for transportation or conservation, racks, furnishing objects, toothbrushes, consumption for food and medicinal purposes (see Table 1).

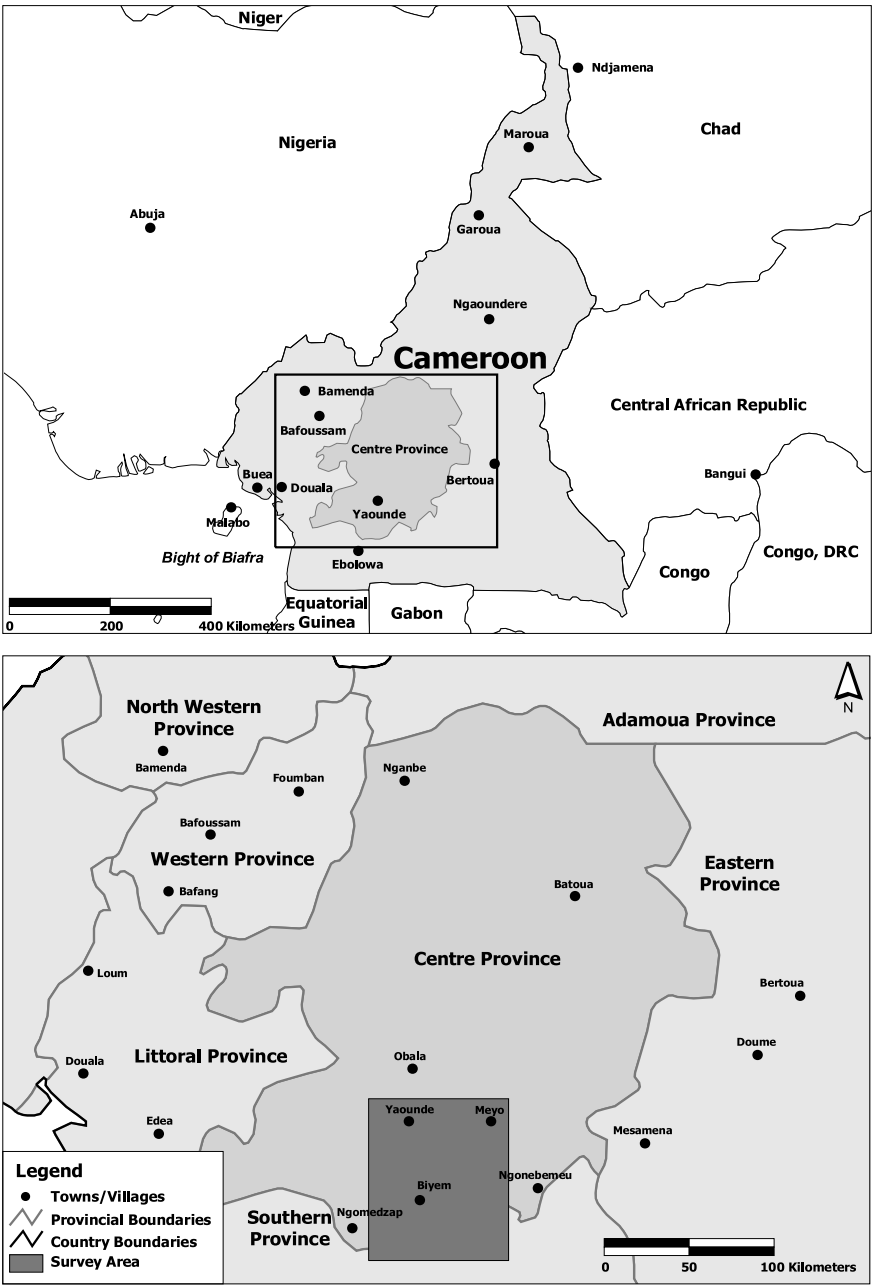
Considering the multidimensional importance of rattan and the pressure on this NTFP (Shiembo 1982, 1986; Béné 1994; Ndoye 1994) we decided in 1996 to study it within the framework of our thesis. This study focuses on the rattan industry in south Cameroon and its main goal is to contribute to the development of a policy for the rational management of rattan. The Yaoundé region (see Figure 1) constitutes the intensive research site of this initiative whose main objectives can be summarised as follow:

Table 1. Mains species and known rattan uses in the region of Yaoundé

Species' local names (Ewondo)	Species' scientific names	Classes of diametre	Traditional uses	Main modern uses	Level of marketing
Ékè, ekaye, nkan	*Laccosperma secundiflorum* (P. Beauv.) Küntze; *Laccosperma robustum* (Burr.) J. Dransf.	Large	Manufacture of baskets, hoods, racks, furniture; feeding; medicine (against intestinal and stomach pains)	Making of furniture, transportation, preservation and presentation objects	Very high
Nlong	*Eremospatha macrocarpa* (G. Mann.& H. Wendl.) H. Wendl.	Small	Making of baskets, racks, furniture; building of houses, huts	Making of furniture, transportation, preservation and presentation objects, services or ornamental objects	Very high
Nlong	*Eremospatha wendlandiana* Dammer ex Becc.	Small	Making of baskets, racks, furniture; building of houses, huts	Making of furniture, transportation, preservation and presentation objects, services or ornamental objects	Average
Ébori	*Oncocalamus mannii* (Wendl.) Wendl.	Large	Manufacture of baskets; of building houses, huts	Making of furniture, transportation, preservation and presentation objects, services or ornamental objects	Very insignificant
Pepac, akwas	*Eremospatha hookeri* (G. Mann & H. Wendl.) H. Wendl.	Small	Toothbrush	None	Non-existent
Pepac, akwas	*Eremospatha sp*	Small	Toothbrush	None	Non-existent
Mekossi	*Laccosperma opacum* (G. Mann & H. Wendl.) Drude	Small	Manufacture of baskets and hoods	Almost none	Non-existent
Nding	*Calamus deëratus* G. Mann & H. Wendl.	Small	Manufacture of baskets, racks, furniture; building of houses, huts	Making of furniture, transportation, preservation and presentation objects, services or ornamental objects	Very small or absurdly low

Sources: Field work of the author; Béné 1994; Nzooh Dongmo 1995; Mba Enyougou 1996.

Figure 1. Map of the study area

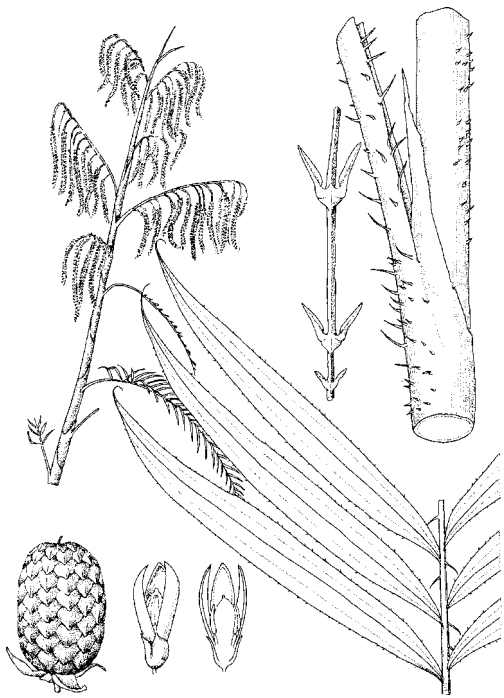


Source: ESRI Data and Maps 2002.

- To identify components, outline major characteristics, functioning mechanisms, social, economic and cultural importance as well as constraints related to the rattan sector in Cameroon;
- To access the pressure on the resource base and the impact of this NTFP exploitation; and
- To contribute to a strategy that can lead to the development of the rattan industry and the sustainable management of the resource.

Although Cameroon has many regions where rattan exploitation for commercial purposes is relatively important (Sunderland *et al.* 2003), this chapter focuses exclusively on the Yaoundé basin. The region is situated in the south of Cameroon (3°05'–4°00' north; 11°25'–12°50' east) and constitutes the most important rattan exploitation basin of the country. It is a zone in which the Guinea type of Equatorial climate predominates and which is covered by humid dense forest (Laclavère 1979). The study region comprises both towns and rural areas. In villages, agriculture is the most important activity.

This chapter briefly analyses the production-to-consumption system of rattan in this region. It focuses particularly on the raw material production, processing, marketing and the policy environment of rattan. The chapter also presents trends and issues in the sector. Finally, it tackles the conservation and development lessons of rattan exploitation in the region.



(Laccosperma secundiflorum)

METHODOLOGY

In a bid to achieve the above objectives, I adopted a specific data collection procedure in Yaoundé and in seven villages on its outskirts, namely Fakeleu 2, Mbanga-Nkolmekok, Meyo, Ngat Bané, Ozom, Zamakoé and Zoassi/Zock. The villages were selected after pilot surveys using the following criteria: accessibility, type of dominant activity, intensity of involvement in rattan sector and demographic importance. Data collection was based on direct observations, informal discussions, interviews, measurements (distances between inhabited area and harvesting site, length of rattan harvested, surface of breach created by harvesting etc.), tests ('perishability' of raw rattan, resistance of some part of a stem etc.), second hand data collection and the use of standardised questionnaires. In choosing the survey units, our preferential sampling method was the sampling directed by population stratification (stratified random sampling). For example, for surveys in the villages, households where stratified according to the criteria 'involvement or not in rattan exploitation' (two categories: households involved and households not involved) and the type of activity in the rattan sector (three categories: harvesters-sellers of raw material, harvesters-craftsmen, artisans). Furthermore, for the collection of some specific data, we used either the 'instantaneous sampling' or the 'focal subject sampling' method according to the nature of variables and contexts.

The implementation of the surveys took place in three essential phases, namely the presifting (or pre-analysis), the analysis and treatment or processing of data. Data processing was manual for certain aspects and computerised for others. After entering quantitative data into the computer, we did simple statistical processing: numbering, calculation (absolute and relative values, averages etc.), sketch of statistic tables and diagrams etc. Quantitative data were combined with qualitative information for analysis.

BRIEF PRESENTATION OF THE SECTOR IN THE YAOUNDÉ REGION

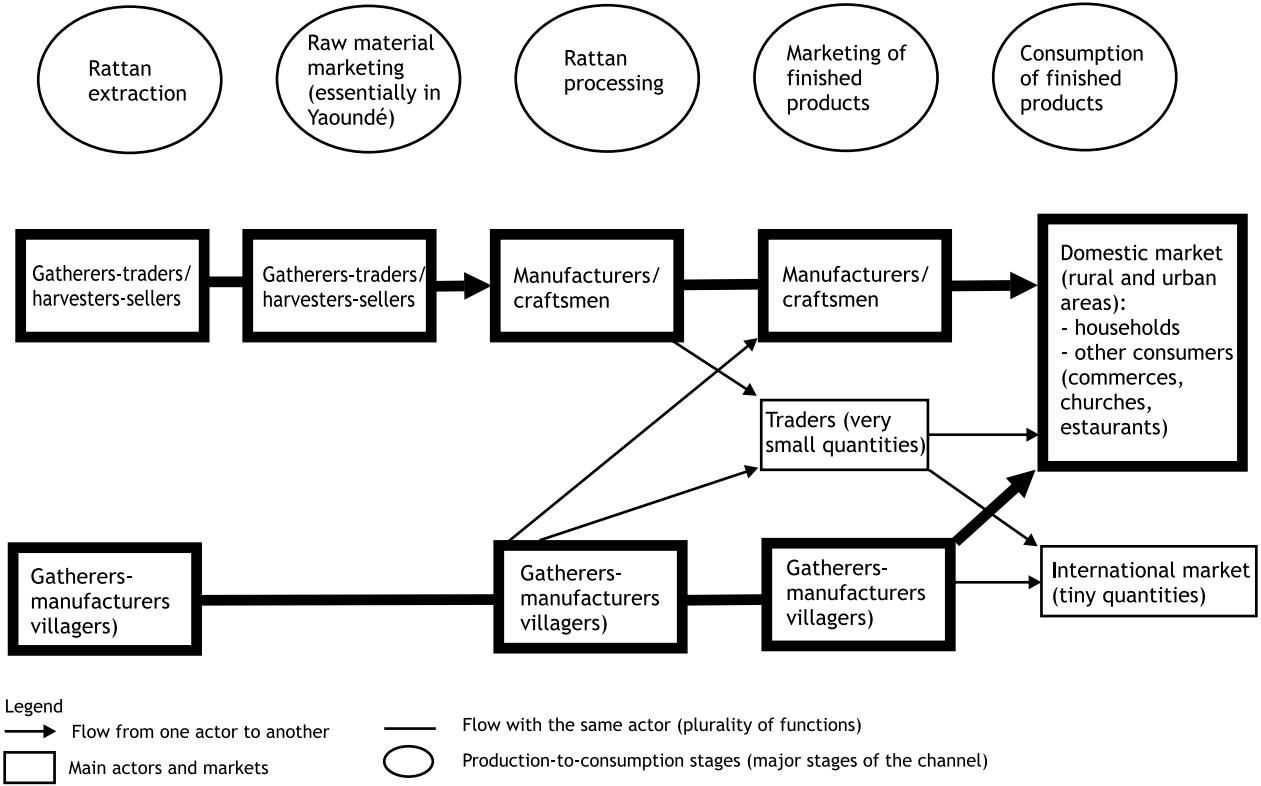
Cameroon is one of the richest countries of West and Central Africa as far as rattan species diversity is concerned. Eighteen of the 20 known African rattan species occur in Cameroon (Sunderland 2001). Out of these, three are commercially very important: *Laccosperma secundiflorum, Eremospatha macrocarpa* and *Laccosperma robustum* (Sunderland 2001) (see Table 1).

The rattan production-to-consumption system—that is, the entire channel from the production of raw material to the consumption of finished products—in the Yaoundé region is very simple, as illustrated in Figure 2. The major participants of the production-to-consumption system include harvesters, artisans and consumers.

Rattan harvesting in the region

Up to the 1960s the bulk of rattan harvested from the forest of the area was used as service material within the framework of the village economy. Since then the combination of several factors such as increased urbanisation and Westernisation favoured the speeding up of rattan harvesting, especially *Laccosperma secundiflorum* and *Eremospatha macrocarpa,* for large-scale commercial purposes.

Figure 2. Rattan production-to-consumption channel in Yaoundé region



Note: The thickness of lines and the size of boxes at the level of actors and flows give an idea of the proportions involved.

Rattan harvesting takes place exclusively in natural rattan stands in an archaic manner and without any management plan: Rattan is not cultivated in this region. The only tools used by harvesters are a machete and a file, which are used not exclusively for the harvesting of rattan, but equally for almost all production activities. Mature stems are selected (the rate of stem harvesting per cluster varies from approximately 40% to 100%), drawn, carefully stripped of their leaves, cut into pieces (*eguainées*) and/or scraped off (preprocessing operations) and stacked in parcels or bundles.

Extraction output is low: 28% of the length of *L. secundiflorum* and 44% of usable *E. macrocarpa* is abandoned on branches or simply in the forest because they are entangled in the canopy, retained by a device or an environment that hooks and twist them up (Defo 1998). Natural populations suffer not only from these huge losses, but also from the harvesting pressure (high demand in some villages), which is sharply detrimental to its dynamics. The exaggerated harvesting of mature stems from clusters limits the production of suckers by clones, or vegetative regeneration (Nzooh Dongmo personal communication). Furthermore, the fact that the clones are permanently besieged does not give the rattan population the possibility of getting to the reproductive and seedling stages. In addition, rattan populations in some sites are subjected to clearing for agricultural purposes.

The extraction of rattan has an impact that is far from being harmless or neutral on the ecosystem. Harvesting in most cases results in the destruction of grass, seedlings, bushes or shrubs and support branches. It deprives some grasses or herbs of their support and sometimes some beetles or coleopterous insects and ants of their habitat (Defo 1998). If perhaps these insects play a fundamental role in vital functions of rattan and if the relationship of dependence at this level is rather specific, the destruction of their habitat would certainly have negative impacts on the dynamics of the plant populations[2]. Furthermore, rattan harvesting in the Yaoundé region frequently contributes to promoting hunting, which in any case is not surprising given the context within which rattan harvesters evolve.

Rattan harvesters and the socio-economic context

Most of the local rattan harvesters are relatively young married men: 96.4% of harvesters-sellers are male and 85% are between 16 and 40 years of age; 63.1% of harvesters-craftsmen are 18 to 40 years old and 78.0% of these actors are married; 1.2% are illiterate, 60.0% went only to primary school, 38.8% reached secondary school and none had higher education. They have on the average six persons under their care. Those who presently harvest and sell rattan have not actually been in the business for long, for their average experience or seniority is only approximately four years and 92% have less than 10 years of experience. These rural harvesters come from average and low social categories from the viewpoint of material wealth. But at the village level they are far from being marginalised persons because they are well integrated in the local socialisation and economic systems. They do not constitute any proper or specific social class or category.

Harvesters belong to the Ewondo and related groups (subset of the great Bantu family), which is said to have arrived in the forest zone in the nineteenth century from Adamawa (Mveng 1963, 1985)[3]. The populations are distributed in a myriad of diverse size hamlets and constitute segmental societies (communities without strong sociopolitical leadership). This characteristic has far-reaching implications on natural resource exploitation and at the level of the 'anthropic'[4] ascendancy over space. The region has 10 to 40 inhabitants per square kilometre (Santoir 1992), and the low rural densities contribute to the perpetuation of this situation and have remarkable repercussions on the main economic activity of the region—agriculture (loose land tenure system, bush fallowing). Villagers within the scope of this study mainly practice food producing or crop agriculture (slash and burn shifting cultivation system) and cocoa cultivation (coffee cultivation there is marginal). They equally engage themselves in multiple extra-agricultural activities such as craftsmanship, exploitation of sand, fishing, hunting and the collection or harvest of other NTFPs (*Irvingia, Gnetum,* Marantaceae, *Cola*). The social groups are quite integrated in the market economy, essentially by cocoa farming and the sale of foodstuff products.

The harvesting of rattan constitutes an important element of the village production system as indicated notably by the share of households involved (35%) and the monetary income obtained (approximately 42% of global income of household concerned; US$276 of average annual income per household involved against for example US$174 for cocoa, US$1,556.5 for small scale wood sawing and US$202 for foodstuff cultivation for example; annual average monetary income of households involved in the exploitation of rattan amounts to US$822.3 against US$654.5 for those who are not involved and US$704.9 for all categories of household). Figures 3, 4 and 5 show from where households in the seven villages derived income in various contexts. Taking all the indicators into account, rattan exploitation constitutes the second most important activity after agriculture. The money from rattan is important not only in absolute and relative value terms, but also and especially because of its rapid or immediate and relatively regular nature, which makes it a great means to face current cash flow problems.

This and many other characteristics allow the exploitation of rattan to integrate harmoniously in the multiple activities villagers undertake to survive. Monetary income stemming from rattan often contributes to the development of other activities. Rattan exploitation and other economic activities usually alternate in the timetable of villagers. This combination unfortunately does not allow rattan harvesters to have an acceptable standard of living, even if compared to others farmers some rattan harvesters and artisans enjoy a somewhat higher income. Just like the other farmers they live in poorly constructed houses, have difficult access to medical care and have no access to conveniences such as electricity and pure drinking water. They have therefore been evolving in a context of abject poverty (in the context of the whole country and according to the World Bank and IFM indicators) (Banque Mondiale 1995) for more than a decade by way of a severe economic recession and a systematic resignation of the state in the face of some of its fundamental social missions. Actors of the processing sector equally operate in this context of poverty.

Figure 3. Structure of global cash income of rural households of seven villages in the Yaoundé area

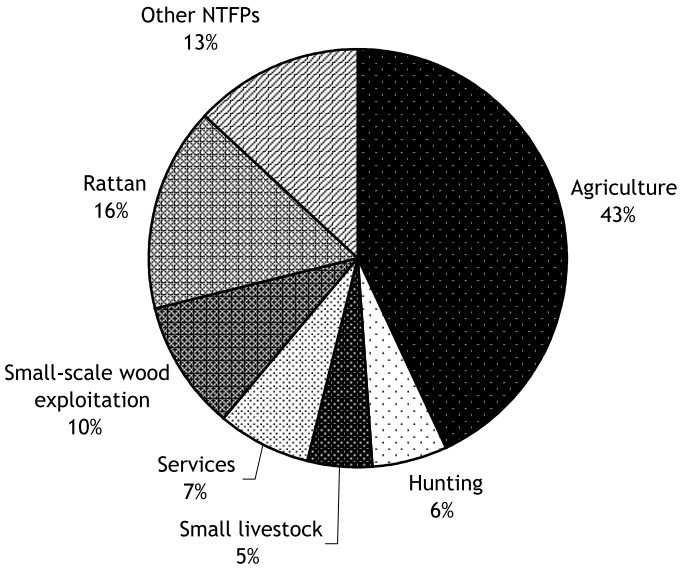


Figure 4. Total cash income of producer households in seven villages in the Yaoundé region

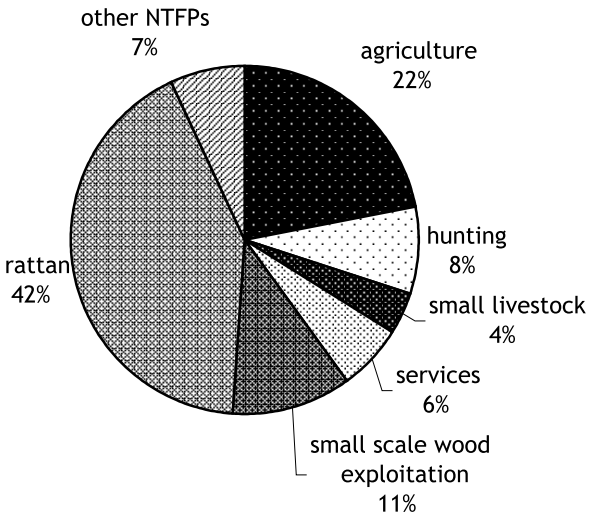
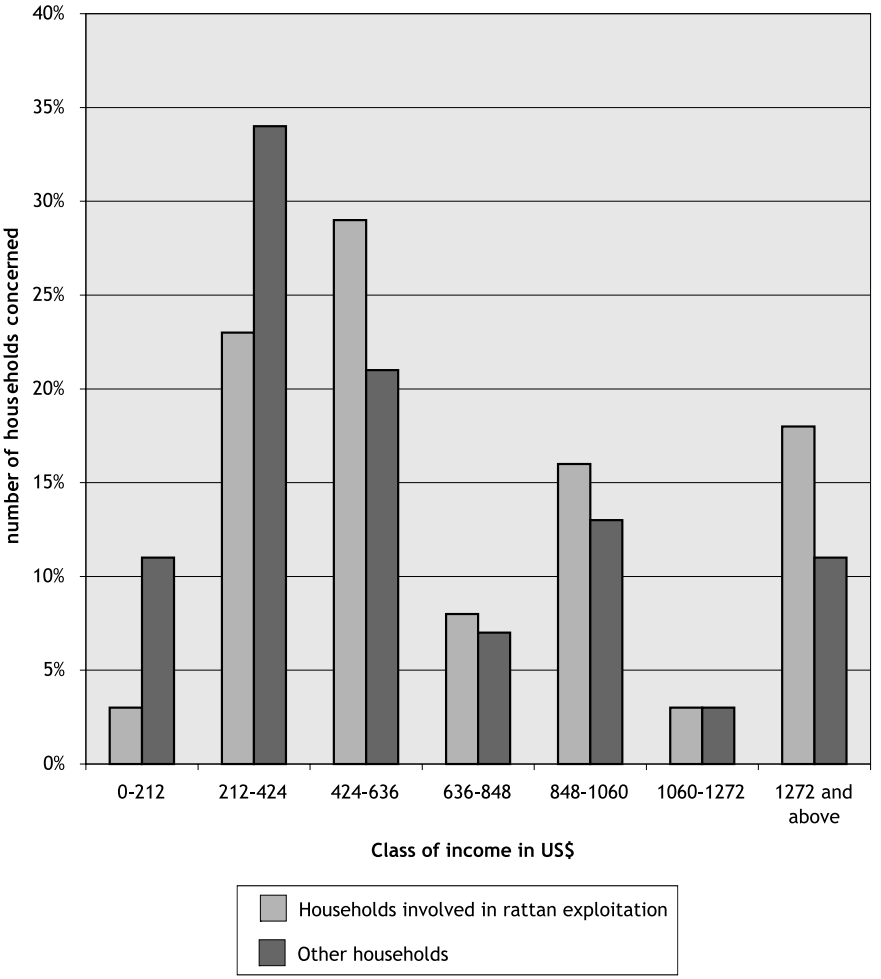


Figure 5. Distribution of annual monetary revenue of rural households in seven villages in the Yaoundé region



Rattan processing

Rattan harvested from forests of the region is processed (preparation of the rattan and manufacture of objects) in processing units (PUs) in rural areas, in secondary cities and especially in Yaoundé. This national metropolis polarises the greatest part of commercialised rattan and constitutes the main centres of rattan craftsmanship with about 120 PUs and 272 persons directly involved (proprietors, employees, pieceworkers, apprentices and family help or assistance). This is why in this section, we are going to base our presentation almost exclusively on craftsmanship in Yaoundé.

The PUs in Yaoundé are to 99.14% run or operated by men. These artisans are on the average 35.1 years old. The majority (62.4%) is married. About one-third (36.6%) belongs to the Ewondo ethnic group, while Bamiléké represent 17.9%, Widikum 17.0% and Eton-Manguissa 13.0%. They have an average level of education, for 40% have been to college and 5% have undertaken university studies. Their average seniority in rattan processing is approximately 13 years. The economic crisis and its corollary, unemployment, have played a great role in making many of them join the trade; 44% became basket makers when the recession set off. Craftsmen work under modest material and organisational conditions (Defo 1997, 1998; Sunderland *et al.* 2003). Rattan processing in Yaoundé as in rural areas takes place in microstructures as shown by the following indicators.

- The average workforce of a PU is just 2.3 persons.
- The working capital and the average cost of equipment are only US$83 and US$66 respectively.
- The equipment used is simple, manual, indeed rudimentary and essentially limited to hammer, knife, measuring tape, gas for burning, brushes and metal saw.
- The infrastructure is not enviable. About 44% of rattan processors work mainly in the open and 40% in sheds or on a veranda.

Furthermore, 52% of PUs operate in the homes of craftsmen (house-based rattan processors). A good number of these PUs are family workshops. In contrast, among PUs located outside of residences there are hardly any of a family nature. These are essentially individual microstructures that sometimes hire the services of pieceworkers or temporary technicians on piecework.

The work in workshops takes place in a simple enough manner. Generally, almost all stages of manufacture or production (apart from the preparation of materials) of an article are undertaken by the same craftsman. Processing activities are generally carried out in three main stages: (1) preparation of material, during which the craftsman scrapes, dries, measures, cuts, splits and arches the rattan; (2) assembly or setting, which comprises forming the basic framework or armature, weaving and/or veneering and caning or padding; and (3) finishing, during which the craftsman attaches the blades, decorates and coats (application of paint or varnish). This work ends up in the production of a range of fairly large objects: articles for transportation, conservation and presentation (basket carried on the back, baskets, trays), furnishing objects (armchair, table, shelf), articles for decoration (flower pots), finery objects (hat, bracelet) and service or musical articles (castanets, dummy, picture *jah*). These objects come under utilitarian craftsmanship as well as under arts craftsmanship. Some amongst them (baskets carried on the back, castanets, baskets) are elements of local cultural identity. Unfortunately they are virtually overshadowed by the exorbitant number of exogenous models (trays for receptions, 'Romantic Lounge', 'Queens Chair', laundry basket, luxury shelf etc.) copied from European and South-east Asian catalogues. Marketing imperatives could partly explain this state of things.

Photo 1. Making rattan furniture (Photo by L. Defo)

The marketing of unprocessed rattan and finished products

The marketing circuit is very short and the mechanisms are quite simple. Figure 2 enables us to have an overview of the chain.

The sale of unprocessed rattan

Two categories of agents harvest rattan from forests of the region, namely harvesters-craftsmen and harvesters-sellers. The system is based on the second category of stakeholders (cutter/harvester-seller) being the most important, and it is this category that really concerns us. After the cutting and constitution of bundles, the cutters-sellers transport the rattan themselves on their heads or shoulders from the forest to roads suitable for motor vehicles or directly to their living quarters, where it is put into storage while waiting to be conveyed by trucks, pick-ups or minibuses to the unprocessed rattan market of Yaoundé. The costs of transportation varies with the distance, the state of the road, the season, the load and the negotiating ability of the cutter-seller. The average cost is US$0.54 for a parcel of maraca (approximately 70 m) and US$0.36 for a roll (approximately 75 m) of small diameter cane (filet rattan) and represents 20% to 25% of the price of the goods conveyed to Yaoundé. This cost is relatively exorbitant and represents the harassment by public sector employees (police, 'gendarmes', forestry officials) or 'informal taxation' along the road, and sometimes the lack of transportation opportunities, a real constraint of this trade.

For approximately four decades, Yaoundé has had a sales point for unprocessed rattan situated in the Mvog-Mbi neighbourhood (Defo 1996, 1998). This sales point is provided with fresh supplies from cutters-sellers coming

Photo 2. Harvester transporting rattan cane (Photo by L. Defo)

from 40-odd villages of the countryside of Yaoundé. Commercialisation on this sales point is done freely (it suffices to pay the storage fee to the proprietor of the land) and it is carried out by the cutters themselves (hence the name of cutters-sellers) directly to the craftsmen, without any intermediary. They negotiate individually with the craftsmen, without any real agreement among cutters-sellers on prices, which contributes enormously to weaken their position in the face of buyers.

Provision of fresh supplies of cane to the sales point is undertaken spontaneously, in a disorganised manner. The demand for rattan varies according to the agricultural calendar, to seasons, to the school calendar, to that of great feasts and some circumstantial events. Thus for example, between 5 August and 8 September 1996, a time of school holidays in the dry season with low activity on the agricultural calendar, 4,225 parcels and bundles of rattan were received at this sales point as compared with only 1,764 parcels in the busy period from 30 September to 27 October 1996 (the rainy season, school period, periods of dense and restricting agricultural activities) (Defo 1997). Consequently the market witnesses considerable periods of oversupply, but also of periods of shortage during the year.

Prices of rattan also fluctuate considerably by virtue of the law of demand and supply. The average prices in 1996/97 were close to US$0.035 and US$0.022 per metre for the maraca and small diameter cane species respectively.

The trade of finished rattan products

Rural craftsmen's articles are sold directly to either villagers, city dwellers visiting or passing through the villages (some craftsmen make exhibitions near busy trunk roads) or to city dwellers in the city. In this last case, the village craftsman passes through a retailer installed in the city or supplies his goods directly to the final consumer. A tiny percentage of the articles sometimes find themselves abroad at the end of the circuit through the intermediary of a tourist or an occasional retailer.

The rattan bought from the Yaoundé sales point is conveyed by taxi or rickshaw (*pousse-pousse*) from Mvog-Mbi to the PUs spread across the city. The manufacture of finished articles by craftsmen is undertaken either on order or for exhibition and sale. The range of selling prices of finished articles is wide. Extreme prices recorded in 1996/97 were US$0.36 for a small flower pot and US$381 for a lounge set made from rattan and Chinese or Indian bamboo. Table 2 presents current articles as well as their respective selling prices.

Table 2. Selling prices of the main current articles in the region of Yaoundé

Object	Price (US$)
Market basket, floor with plywood, simple finishing, L40 W125 p20	1.7–2.5
Market basket, floor with plywood, simple finishing, L50 W30 p20	2.5–3
Round basket, D20 p24	1.4–1.7
Round traditional basket (*dziat*), D45 p20	0.8–1.7
Tray, floor with plywood, L30 W20 p10	1.4–1.7
Tray, floor with plywood, L36 W17 p7	1.4–1.7
Simple shelf, H110 L60 p30	5.9–6.8
Simple shelf, H130 L70 p30	6.8–8.5
Simple lounge chairs	15.2–34
Lounge (*aboa*)	84.9–203.7
Padded lounge	203.7–271.6
Simple dining set	51–118.8
Laundry basket, D80 p90	5.9–7.6
Flower pot (for hanging), D10 p25	0.8–1.4
Basket with slack handle, D40 p80	0.8–1.4
Basket with tight handle, D36 p55	1.4–1.7

Key (Notes)
L= length in centimetres
W = width in centimetres
H = height in centimetres
p = depth in centimetres
D = diameter in centimetres
A lounge consists of four armchairs, one couch (settee) and one centre table.
A dining set consists of six chairs and one table.

These craftsmen sell their articles themselves, in most cases, to the final consumers. But some among them, especially those that manufacture fine basketwork articles, sometimes supply retailers. The volumes of sales from PUs vary throughout the year. High periods are in December (end of year feasts) and September (arrival or return of holiday makers from the West).

The space used for manufacturing is in most cases also used for exhibition and sales or at the very best, the sales location is adjacent to the production area or not very far from it. Craftsmen in Yaoundé sell almost all of their productions on the domestic market. Very few articles from these craftsmen are sold abroad. Decision-makers should thus make efforts to establish favourable or enabling conditions for exporting Cameroonian articles in order that the country could[5] benefit from the international market of rattan, which is huge and highly remunerative (ITTO 1997).

POLICY ENVIRONMENT

Since the colonial period the state has assumed the right to property on almost all land and forest stands of the national territory and left to the populations only the traditional usage right. As concerns particularly forest resources, this principle was given concrete expression through a battery of successive texts: ordinance 73/18 of 22 May 1973, decree 74/357 of 17 April 1974, law 81/13 of 21 November 1981, decree 23/170 of 12 April 1983 and so on. The Cameroonian government reached a decisive stage in the process of improving the framework governing the exploitation of forest resources with law 94/01 of 20 January 1994 to lay down forestry, wildlife and fisheries regulations and decree 95/531/PM of 23 August 1995 to determine the conditions for implementing the forestry regulations. Through these texts, public authorities intend to put some order in the forestry sector, to reconcile conservation imperatives and economic constraints and to promote participatory management of forest resources.

According to this new framework, the harvesting of NTFPs for lucrative purposes is subject to obtaining an approval (*agrement*) and an exploitation permit, the payment of a tax to the public treasury (US$0.018/kg according to the finance law) and the establishment of a way bill for the conveyance of the good. This framework is overly ambiguous as far as NTFPs are concerned (Defo 1999c) and the provisions relating to community forests offer more flexible possibilities (all forest resources of a community forest except the protected species belong to the concerned population and the official formalities to gather these resources are not very heavy).

At the level of marketing of unprocessed rattan and its by-products, following fiscal provisions in force, the seller should pay a tax called *impôt libératoire* to the local council where the business is done, the amount of which depends on the turnover. The rattan processing activity is just liable to taxation as the other essential parts of the channel. Considering the reduced volume of their activity, rattan craftsmen of Yaoundé are classified under the global tax scheme of US$28.25 to US$141.24 per year according to the size of the PU.

Despite recent positive evolutions such as the establishment of a subdirectorate for NTFPs in the Ministry of Environment and Forestry, the Cameroonian state has not yet put in place a real intervention policy destined to significantly orient or to promote the development of NTFPs. It is not closely or concretely interested in the harvesting of rattan, it does not grant any subsidy to the small-scale sector and it has not made any significant and direct investment in the sector—which moreover conforms to the policy of liberalisation and privatisation currently in force in the production sector in Cameroon.

The state has nevertheless undertaken some limited actions touching on the rattan industry. The almost yearly organisation of best craftsman contests, the financing of the Cameroonian Enfance Betamba Institution, in which rattan craftsmen (among others) are trained, and the support for rattan basketwork in some penitentiary establishments are the state's only perceptible direct interventions in the rattan environment besides the regulatory and legislative framework mentioned earlier.

KEY ISSUES

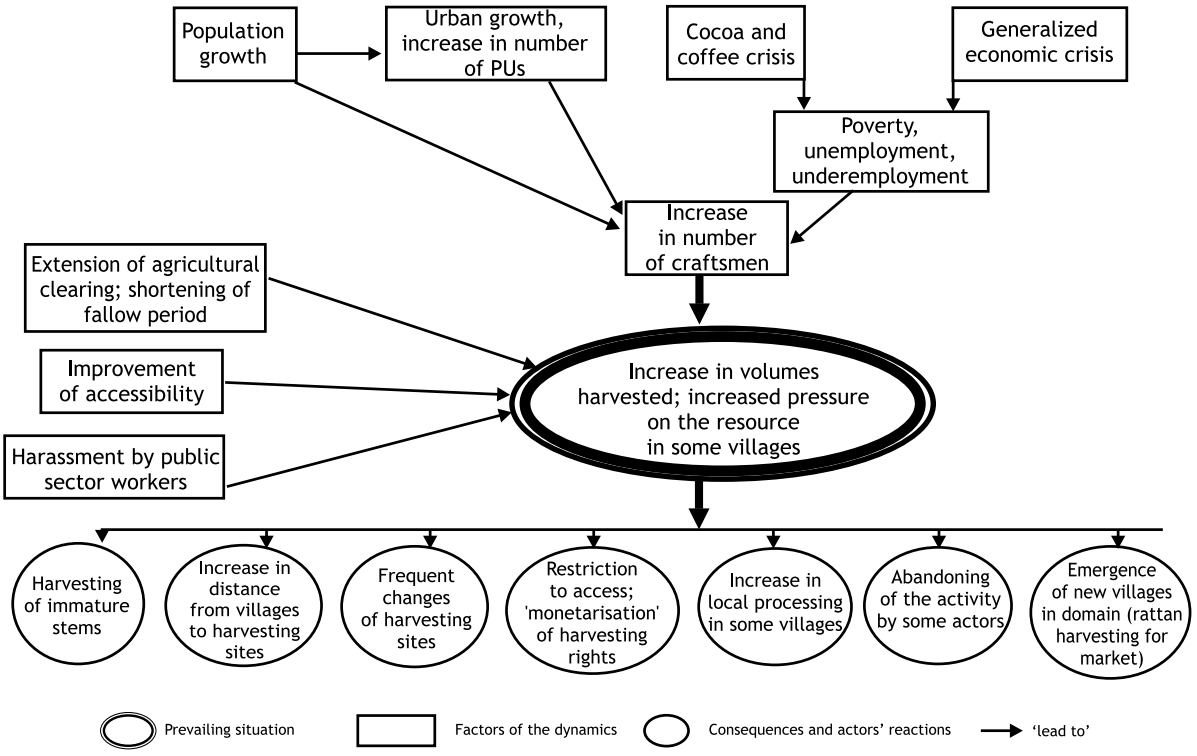
The dynamics of the rattan industry in the Yaoundé area

The rattan industry has witnessed an interesting evolution over the past several years resulting from certain changes in the cultural, social and economic environments.

At the level of raw material extraction

The most significant evolution at the level of raw material extraction is the drastic increase in harvested volume and the sustained pressure on the resource, which has resulted in the scarcity of rattans in about 43% of the study sites (Defo 1998). This increased pressure is given concrete expression among other things in the harvesting of immature stems, the restriction to access in 'private'[6] forests, the institution of payments for harvesting rights in these forests, disputes about the harvesting sites in the 'common' forests and open access areas (competition for access to the resource), frequent changes of harvesting zones and the increase in the distance between the harvesting sites and the living quarters (for example in Zimakoé, the average distance has increased from about 6 km to 9 km between 1992 and 1997 (Defo 1998, 1999a)). The pressure was mainly due to the persistent population growth and urban development, technical changes, the fall in the prices of cocoa and coffee, the economic crisis, which resulted in underemployment, unemployment, pauperisation of the masses and an appreciable increase in the number of harvesters. The extension of clearing for foodstuff farming to the detriment of rattan sites and the shortening of the fallow period in some villages contributed to the reduction in the availability of the resource and the dynamics of the rattan stands. Furthermore, a significant expansion of the supply area was noticed with the sprouting up in the ranks of harvesting sites around new villages such as Mapan, Avebé, Meguéme, Mbega among others. This extension

Figure 6. The main elements of the dynamics of rattan harvesting in the Yaoundé area



is related to the above-mentioned factors and in some cases it was facilitated by the improvement of accessibility (conditions of transportation) in the area. Lastly, it is equally worth noting that in some villages the speeding up of harvesting and the evolution towards scarcity of the resource contributed to the emergence of the tendency for local processing of rattan for commercial purposes to the detriment of sales in the unprocessed state. This is part of the strategy of farmers aimed at maintaining their rattan income, or better increase its value and make their harvesting efforts profitable. Such are the major characteristics of changes that have occurred at the level of the basic segment of the sector during these past years. Figure 6 summarises these evolutions.

At the level of transportation

The most important recent change at the level of transportation is the cost increase from about 10% to 25%, according to villagers, and the increase in harassment of the harvesters-sellers from public sector employees. In fact, with the setting up of the legislative and regulatory framework governing the forestry sector in 1994/95, forest products control posts have multiplied. Since then, using the said provisions (which they however have little or no mastery about) as pretext, the public sector workers have increased illegal financial levies on the rattan harvesters-sellers along the major highways. These practices contribute to increase the pressure on the resource because many harvesters endeavour to harvest the maximum quantity of rattan possible in order to try and meet these losses by anticipation (Defo 1999c).

At the level of rattan sales-points

The just mentioned strategy of maximising the volume harvested contributed—alongside the factors mentioned earlier—these past years to the appreciable increase in the quantities of rattan available at the Yaoundé sales point. The volume of rattan trade has witnessed considerable increase, and scarcity periods of rattan have become less frequent and less severe in Yaoundé now as compared to the situation a few years ago. At the moment, the general trend during a good part of the year is to oversupply the market because the increased rate of demand has not also been as considerable and sustained as that of the rise in supply. This situation often inhibits efforts by the harvesters-sellers at raising the price of unprocessed rattan. In spite of the handicap, there has been an overall price increase to the tune of 15% between 1996 and 2000 (author's unpublished data). This small price increase was among other things favoured by very sporadic appearances of retailers at the Yaoundé sales point. Two of them stayed for a few weeks in the market between 1995 and 1999 and since October 2000, another one is trying to position himself in the sales circuit.

At the level of rattan processing

The most significant evolution at the level of rattan processing has been the increase in the number of PUs in both rural areas and the city, efforts in the modernisation and improvement of equipment, infrastructures and organisation

of work of some structures[7], the diversification of the types and models of objects manufactured[8], attempts by some craftsmen at regrouping and especially the increase[9] in the selling price of almost all the finished products. This increase can be explained largely by the price increases for inputs from gas to gum and plywood, which have become all-too-frequent since the devaluation of the local currency.

In the area of outside interventions

Initiatives have been taken in the study area as well as in the whole humid forest zone of Cameroon. This recent support was especially of a financial, technical and organisational nature. The outside assistance, exclusively directed towards processing, was provided essentially by national or international non-governmental organisations such as Prolabore, which has trained some artisans, and foreign governments such as Germany's Deutscher Entwicklungsdienst, which helps some craftsmen by way of counselling. Unfortunately, these interventions are not of a big scale and thus have limited impact. Besides, they are not only concerned with the rattan sector, but equally with craftsmanship or small trades as a whole.

Some important points and problems

At the level of resource extraction

At the level of resource extraction it is worth noting that the totality of rattan used in the Yaoundé area is harvested in a rudimentary way from natural stands, without any consideration for or efforts at implementation of rational management. In many forest stands the tendency is that of a free access system within a common exploitation context. The methods, techniques and rhythm of harvesting are far from rational and sustainable (destruction of immature stems in the course of cutting the ripe rattan from the clones, the abandonment of a considerable portion of product in the forest etc.). Coupled with high demand and the agricultural clearing taking place, these practices exert enormous pressure on the rattan and considerably diminish its biomass.

In the villages concerned, rattan exploitation is carried out by relatively young men whose main activity is agriculture, although it is true that rattan has an undisputable economic and social importance to them. These rural harvesters are faced, among other things, with the poor quality of communication channels and 'harassment' from public sector employees who practice 'extortions' which are favoured by the legislative and regulatory framework. This framework (or what it is that plays that role) is limited, not well known and poorly interpreted, indeed almost inapplicable for it is inadequately adapted. There exists no true policy promoting the sustainable development of the sector. The regulations of this sector are ineffective.

At the marketing level

Harvesters sell in Yaoundé, individually and directly to craftsmen. The market is quite open.

At the level of rattan processing and sale of finished products

Processing and sales of rattan in Yaoundé are undertaken by some 100 microstructures run by men originating from diverse ethnic groups. Rattan craftsmanship is their main activity. The infrastructure of these PUs is mediocre, their equipment and techniques simple, indeed archaic compared to the average in South-east Asia. This state of things coupled with the level of the approximate or rough technical and managerial skills of craftsmen contributes to the manufacture of articles of poor, mediocre or at best average quantity and quality compared to Asian products. This partly explains the narrowness of the market and the poor sales often experienced by these PUs (Defo 2002).

PUs are also faced with various other problems including irregular supply of rattan over the year, the preservation of rattan in the workshops, insufficient capital and working capital or contingency funds, the poor quality of equipment, administrative and police harassment, increases in the price of inputs, low selling prices of articles, the absence of a veritable policy of supervision or of promotion of craftsmanship etc.

Moreover, these PUs sell almost all of their production directly to consumers, without intermediaries[10], and they are limited almost exclusively to the domestic market. Very few of the articles cross the national frontiers. The same observation can be made for unprocessed rattan. The channel is ultrarestricted, less developed, with very weak or lax vertical links and almost non-existent horizontal linkage among its components.

CONSERVATION AND DEVELOPMENT LESSONS

Conservation

As we have already mentioned, in the Yaoundé region, rattan is not exploited in a sustainable manner. In some villages, one observes an excessive pressure on clones, which does not leave them enough time to produce regenerating agents (rhizomes, fruits). Extraction often results in the damage of immature stems and considerable pieces of rattan are left on branches of support trees. The pressure on the resource is enormous and the overexploitation is an undeniable reality in some sites (Zamakoé, Zoassi/Zock). Nevertheless, no initiative has been taken that aims at remedying these shortcomings and at promoting a rational management. Moreover, if we consider the present state of knowledge on African rattan species, it would be difficult to elaborate a rational and credible management plan while maintaining the economic exploitation requirements. But compared to the situation before, there are already some data and rough ideas that can be used to build up a simple management plan.

Gaps on various points at the scientific level have to be filled before a credible and strong conservation strategy can be drawn up. Among these points one can cite the evaluation of the biomass, the structure, density and population

distribution of rattans, the rhythm of production of 'plantules' by clones, the growth of stems under various conditions, the phenology, the impact of harvesting techniques on clones in the various stages of development and the relationships between rattans and elements of the *biocénose*.

Concerning the conservation of forest resources, rattan in the region has both enormous potential advantages and non-negligible limitations (Defo 1999b). The main assets of rattan include the fact that it requires for its development that the forest cover be maintained (support), the fact that it is accessible to grassroots populations (its exploitation at the present state does not require much technical and financial capital as compared to small scale logging of timber for example) and the considerable size of its potential or effective outlets at the national and international scale. Rattan exploitation (harvesting, processing) and some activities of forest ecosystems degradation (hunting) have the same agents, and as such the rattan work can slow down these activities by competing for time on the work schedule of stakeholders. That is all the more true as rattan brings in money year round and its exploitation is labour intensive. Furthermore, as compared to some activities that cause the degradation of forest resources (hunting for example), the exploitation of rattan presents a sure advantage at the level of the remuneration of working time (US$1.80 to US$2.27 per day for the rural rattan processors against US$1.4 to US$1.8 for hunting for example, even if it is true that the work effort is more exacting in the case of rattan).

The limitations of rattan in the area of conservation are as impressive as its advantages. Among the most obvious, one can mention the complementarities farmers have created between rattan exploitation and hunting for example (complementarity in the timetable[11], mutual financing) and the low remuneration of the work as compared to some other activities that cause forest degradation such as the small scale exploitation of timber. In the current state of things, it would be illusory to think that this NTFP could be an alternative to deforestation (Defo 1999b; Trefon and Defo 1999). It is clear that rattan exploitation cannot entirely eliminate the direct and underlying causes of deforestation (agricultural expansion, logging, population pressures, government policy, corruption, markets and macroeconomic conditions). Rattan is certainly no panacea and cannot be expected to be a wonderful remedy preventing deforestation.

The promotion of rural craftsmanship and establishing of more remunerative prices for unprocessed rattan could render this NTFP more competitive and enable it to play a positive role in the forest ecosystems conservation. If rattan provides more substantial gains, given that safeguarding the forest is currently indispensable to its survival, the populations may in some cases no longer destroy (in an accelerated and large scale manner) its ecosystem and this NTFP would have thus contributed to the mitigation or reduction of the deforestation rate. However, this promotion would have to be preceded by a rational management plan for the stands and an adequate regulatory system in order to avoid overexploitation due to the race for rattan, which has become more expensive. This possible race would without doubt have a negative impact on the productive potential and the forest ecosystem if prior appropriate technical, social and regulatory measures or dispositions are not put in place.

Potential of rattan in the area of development

We have on several occasions underscored the socio-economic importance of the rattan industry at the levels of employment, income, meeting the needs of stakeholders and culture. Its positive impact in the area of development is irrefutable. The lucrative exploitation of rattan contributes to the alleviation of underemployment and unemployment, enables some rural and urban dwellers to have an income or to increase their financial viability (US$288.5 per year per harvester-seller, US$376.7 annually per craftsman in the rural area and US$969.7 per year per PU proprietor in the city), to meet their needs and those of their family (purchase of medicines, kerosene, drinks, soap, clothes, roofing sheets for their houses and payment of the dowry and school fees). The money derived from rattan contributes to the development of other lucrative activities (purchase of pesticides for cocoa plantations and market gardening, payment for agricultural clearing). Furthermore, rattan processing puts at the disposal of some persons goods corresponding to their standard of living and to their cultural aspirations.

These indices and many others show that rattan has real potential in the area of development in the region. This potential is until now underexploited for the reasons we mentioned earlier. Well defined promotion actions, finely targeted and executed, could enable this NTFP to appreciably increase its contribution to the socio-economic development at the level of harvesters, conveyors, masters-craftsmen, workers, retailers and users of rattan articles. An increased development of rattan within the framework of a sustainable exploitation strategy would be beneficial foremost to harvesters and craftsmen, but equally to the state, which could receive royalties, taxes and earnings.

CONCLUSION AND RECOMMENDATIONS

Conclusion

Rattan exploitation in the Yaoundé region is not adequately developed compared to the sectors of this same NTFP in some South-east Asian regions. This average performance is witnessed at several levels. Rattan exploitation is based exclusively on natural stands, its circuit is short, its main stakeholders are not truly organised, the institutional, regulatory and legal framework that governs it is quite restrictive, its factors of production are mediocre, its outlets remain narrow and outside intervention is greatly limited.

It is however undeniable that this activity plays a non-negligible economic, social and cultural role. This role could be more efficient if a battery of constraints did not limit its scope. It is the same situation as prevails in the other rattan exploitation basins of southern Cameroon. If this NTFP should play a more significant role in the fight against poverty at the level of the less privileged social categories such as harvesters and craftsmen, then the bottlenecks would have to be removed.

Recent evolutions in the rattan industry in Cameroon indeed give room for certain optimism for the future of this activity. Currently, however, the forces of these dynamics are insufficient to give rattan the full measure of its potentials in the area of development and conservation in south Cameroon.

Recommendations

The first recommendation pertains to the management of the resource. Its conservation deserves sustained attention in the interest of both the main actors of the chain and the biodiversity of the region. It is necessary to develop and to implement viable exploitation methods, extraction techniques that take into account the biotope and means of reducing losses during harvesting to the strict minimum. All these measures should be viewed within the sociopolitical perspective, in a set of mechanisms and standards aimed at contributing to a sustainable management of the resource. It is thus necessary to review the regulatory and legislative framework related to the NTFP industry, to elaborate and control the execution of simple management plans and to make it easily applicable. It would without doubt be more appropriate to integrate rattan in multiresource management plans. Selective and rotation cutting taking place in the various forest areas is a desirable conservatory measure. It would also be necessary to reduce the pressure on natural rattan stands by domesticating rattans and by introducing them into farmers' production systems.

The second recommendation concerns the provision of fresh supplies to processing centres. It is necessary to help cutters-sellers to organise themselves to realise some savings at the level of conveyance, to conform to the regulations, to adopt a better attitude towards public sector employees, to considerably adjust supply to demand and to strive to become less vulnerable in the face of buyers. It is also necessary to help them to develop conservation techniques for harvested rattan over a long period.

The third recommendation is related to the transformation and marketing of articles. It is necessary to considerably improve the infrastructure, technical and organisational levels of PUs and to eliminate waste during processing. It is necessary to train craftsmen in processing techniques, managerial techniques and the area of design. This training would enable them to produce good quality articles that are capable of facing competition. This training would also give craftsmen abilities of commercial aggressiveness that are likely to contribute to the expansion of demand for rattan objects. To palliate the poor sales and the unattractive nature of prices, it is necessary to seek other outlets, especially more remunerative markets at the national and international scales.

These solutions require absolutely that cutters and craftsmen organise themselves for their self-promotion, that intermediate level development actors (non-governmental organisations, town councils) support them and that the state intervene positively at some levels. That is perhaps contrary to the principle of 'less state involvement' currently in force, but it is the price to pay to offer artisans the opportunity of taking care of themselves and of efficiently participating in poor people's income improvement in the future. It is also the price to pay for a sustainable exploitation of the raw material.

ENDNOTES

1. University of Leiden (The Netherlands), WOTRO Ph.D. Fellowships Programme. P.O. Box 8297, Yaoundé, Cameroon. E-mail: defotls@yahoo.fr

2. This statement is purely an assumption.

3. These were the last important migrations and settlements in the humid forest zone before the colonial period.

4. This means 'transformed by human beings'.

5. If major constraints are eliminated or attenuated.

6. In almost all cases, what people consider as 'their forest' is state property. In most of these forests peoples only have the right of usage.

7. This effort is manifested through the use of jigsaw and sander and the recruitment of persons for specialised tasks.

8. The diversification of types and models is facilitated by the use of Asian and European catalogues by an increasing number of PUs.

9. Increase from 5% to about 30% according to the quantities and the evolution in prices of industrial inputs used in the manufacture of the object in question.

10. This situation is advantageous for the consumer as far as the price is concerned.

11. The two activities are often undertaken together at the same time.

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Chapter 18

Sport hunting of elephant in Zimbabwe: a case study of Kanyurira Ward in Guruve district

Dale Doré[1] *and Ivan Bond*[2]

Common Names	Part of the resource used	Management	Degree of transformation	Scale of trade	Geographic range
African Elephant, Nzou	Elephant	Wild	High	International	Large

ABSTRACT

The Communal Area Management Programme for Indigenous Resources (CAMPFIRE) allows communities to benefit from the management of their wildlife resources. A number of rural district councils, acting on behalf of local communities, have been granted the legal authority to manage wildlife within their communal areas. In Kanyurira Ward, which lies in the Zambezi Valley, the council entered into an agreement granting a safari operator the sole right to hunt a certain quota of animals in a defined wilderness area that is rich in wildlife. The community manages this area by conserving both the habitat and the wildlife itself. In return, households are paid a portion of the revenue earned from sport hunting, especially for elephant. The people of Kanyurira, through its Ward Wildlife Committee, have received substantial financial, technical and organisational assistance from donors and non-government organisations.

INTRODUCTION

As human settlement expanded within the communal areas of Zimbabwe, people came into conflict with wildlife. Wild animals, especially elephant and buffalo, damaged crops and livestock and threatened the life and limb of people. Increased settlement, on the other hand, threatened wildlife through the loss of habitat and by subsistence and illegal hunting. In response, the Department of National Parks and Wildlife Management initiated CAMPFIRE, the Communal Areas Programme for Indigenous Resources (Martin 1986).

The purpose of CAMPFIRE was to provide communities with an incentive to conserve wildlife by treating it as a resource from which they could benefit.

It was therefore decided, as a first step, to confer 'Appropriate Authority' status on rural district councils under the Parks and Wild Life Act of 1975, thus enabling them to manage wildlife resources on behalf of the communities they represented. This allowed them to benefit from a variety of wildlife-based activities. The councils, however, were granted this status on the understanding that they involved 'producer communities' in the management of wildlife and that they passed on a substantial portion of the financial benefits of wildlife management to these communities. Producer communities are those that are in direct contact with wildlife, bear the costs of wildlife damage, and take primary responsibility for managing wildlife (Murphree 1993).

Since 1989, 36 rural district councils throughout Zimbabwe have been granted Appropriate Authority. Approximately 16 of these districts can be considered wildlife producers, i.e., they are able to generate income from wildlife activities. More than 90% of wildlife revenues have been earned from the lease of sport hunting rights to commercial safari operators. Of this revenue, over 60% is directly attributable to one species, the elephant (Bond 1994; 1999). Although rural district councils are not legally required to devolve the management of wildlife to producer communities or to pass on the financial benefits, they invariably follow a set of principles contained in the CAMPFIRE guidelines developed by the Department of National Parks and Wildlife in 1991. These guidelines recommended that at least 50% of the gross wildlife revenue should directly benefit the communities that manage wildlife. (Murphree (1997) argues that CAMPFIRE was initiated by a strategic compromise between devolutionists and centralists.)

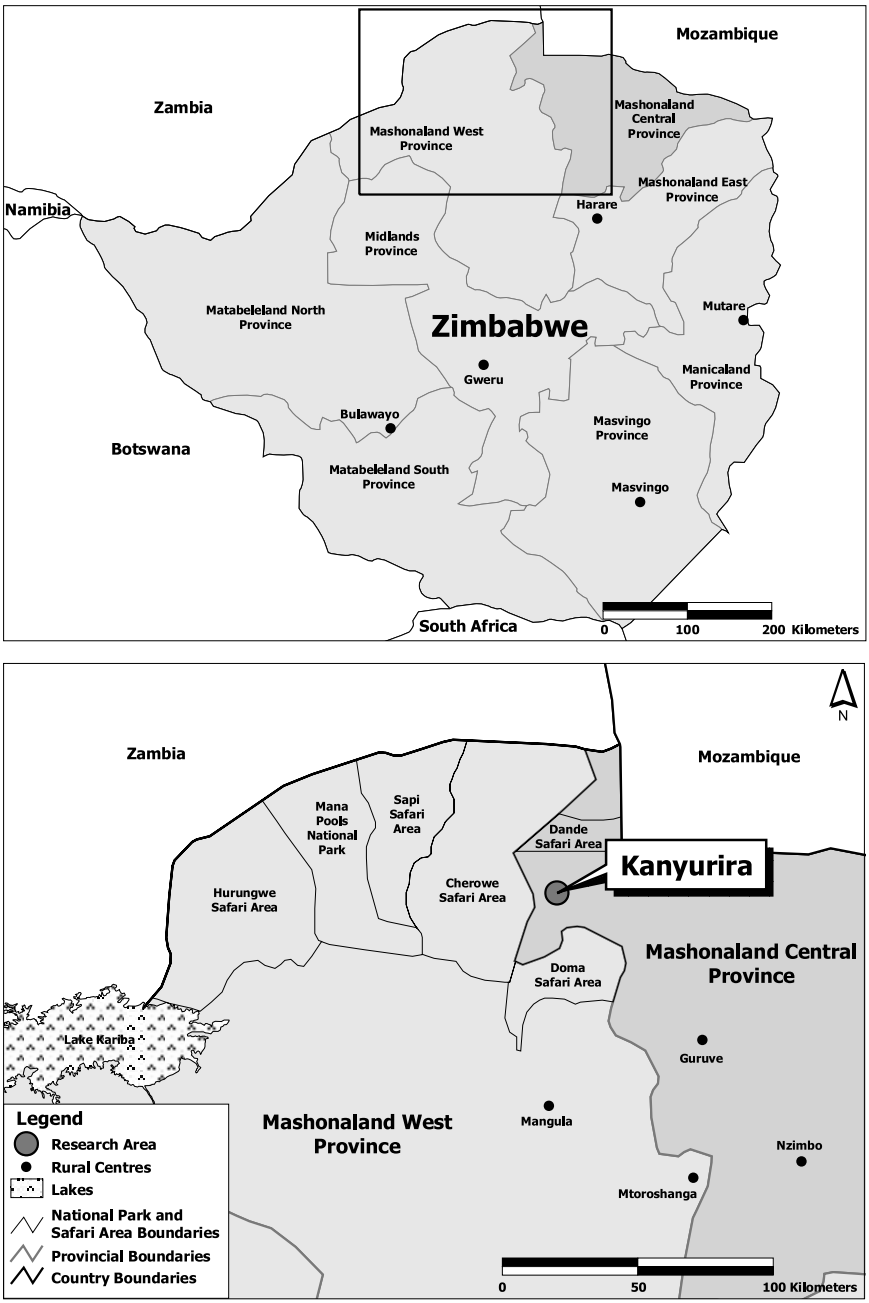
Evidence suggests that CAMPFIRE has slowed the rate of habitat loss and that its benefits have been greatest in areas where communities are small, homogenous, and living in a distinct territory (Bond 1996). Bond (2001) has found a clear inverse relationship between human population size and areas of wildlife habitat; in other words, lower human population densities translate into higher wildlife populations. While difficulties persist within the programme, CAMPFIRE's incentive-led conservation model has resulted in substantial development and conservation benefits in some areas. The most notable and frequently quoted example is Kanyurira Ward in Guruve District (Lynam, 1993; Nabane and Matzke 1996; Murphree 1997), the subject of this case study.

In the next section we examine the human and physical geographic features of Kanyurira Ward that make it suitable for sport hunting. Production to consumption activities are described in the following sections, namely, the management of wildlife, the hunting of elephant and the marketing of the product—the hunt itself. Based on a review of these activities, some concluding remarks are made in the final section.

THE STUDY AREA

Kanyurira Ward, which is also known as 'Masoka' in the literature, lies in the Dande Communal Land of Guruve District, approximately 200 km north-west of Zimbabwe's capital, Harare (Figure 1). Bounded in the south by Doma Safari

Figure 1. Location of Kanyurira Ward



Source: ESRI Data and Maps 2002.

Area and in the west by Chewore Safari Areas, it covers an area of over 400 km^2 (Cutshall 1989). Settlement, consisting of about 250 households, is concentrated along the alluvial soils on the banks of the Angwa River. This area, which is enclosed by a solar-powered electric wildlife fence, consists of a residential area (8 km^2) and fields for cropping (10 km^2). The remainder of the ward (382 km^2) is virgin savannah woodland that is maintained and managed as wildlife habitat (Taylor 1998). Whereas residential stands, gardens and fields are *de facto* 'owned' by individual households, woodland and wildlife are held in common. (Communal lands are legally held in trust by the president for the people living in them. Although members of the community have the right to change the use of the land, they are not allowed to sell it.)

Residents of Kanyurira have traditionally derived their living from small-scale dryland agriculture, supplemented by foraging and subsistence hunting. Kanyurira experiences a long dry season from April to November and a wet season from December to March. The mean annual rainfall recorded at Angwa bridge, 15 km north-east of Kanyurira, is 725 mm (n = 15, CV = 34%) (Lynam 1993). The low and erratic rainfall patterns make agricultural production precarious and crops often fail. As a result, households remained dependent on government drought relief programmes for food before the inception of CAMPFIRE. Apart from the vagaries of weather, income from agriculture was limited by the distance to markets and the poor condition of roads. Crop damage from elephant and buffalo was significant. Since cattle cannot be kept due to the presence of tsetse fly, some households rear goats and other small livestock.

The vegetation of the wildlife habitat area has been described by Taylor (1993), who grouped 14 different vegetation types into i) riverine and alluvial vegetation, ii) dry deciduous forest, iii) *Colophospermum mopane*, iv) *Terminalia* communities, and v) mixed mopane-miombo communities. He suggested a close association between these vegetation types and the soils in the area. As nearly 170 km^2 (40%) of the total area lies above the Zambezi escarpment, the elevation of the area has a considerable range: from about 400 m in the Angwa River valley to 1,120 m at the top of the escarpment (Lynam 1993).

WILDLIFE MANAGEMENT

Campfire

In the past, the quest for survival led the people of Kanyurira to hunt and forage collectively. It has been estimated that the annual average harvest of wildlife was more than 40 kg of dressed meat per person (Murindagomo 1988). Traditional hunting not only had practical connotations, but also spiritual ones. While hunting was necessary to feed families, especially during droughts or the winter when grain reserves fell, the skills of the hunter were also admired. Anecdotal evidence suggests that subsistence hunters usually belonged to a few families that had a tradition of hunting.

Traditional subsistence hunting inevitably brought the people into conflict with the government's wildlife authorities, who harassed and arrested

suspected offenders. Rather than curtailing poaching, this high-handed approach by officials generated resentment towards the state and a greater determination by the people to rid their area of wildlife. In order to achieve this, Kanyurira residents, secretly acquired guns and snares. They also started fires in order to kill animals as well as destroy the environment upon which wildlife depended. Moreover, Kanyurira residents encouraged immigrants to settle in the area. The additional human presence, they believed, would displace wildlife from the area (Dzingirai 1996).

In 1989, the people of Kanyurira were understandably suspicious when they were invited to participate in CAMPFIRE and benefit from wildlife management. Despite scepticism from within certain groups, members of the community elected a Ward Wildlife Committee, which marked the inception of CAMPFIRE in Guruve district. In 1991 Guruve Rural District Council was vested with the right to benefit from the management of wildlife in the district when it was granted Appropriate Authority status under the Parks and Wild Life Act. Thus, while the council was the legal manager of the wildlife resource, it was obliged, under CAMPFIRE, to devolve some management authority to the Ward Wildlife Committee. This committee, elected by registered households within the community, is governed by a constitution that was adopted by the community in 1992 (see Taylor 1998, Appendix 9.3). By 1998 it consisted of eight elected representatives who were responsible for the wildlife management activities of 15 staff members, including wildlife fence minders and game guards.

With the change from subsistence to sport hunting, and the adoption of a new constitution, new local rules emerged, which have tended to supersede any traditional rules that may have governed hunting. The new wildlife management rules, which make it illegal to hunt wildlife without Appropriate Authority and a licence (quota), appear to be widely respected in the community, as there have been few reports of local hunting by Kanyurira residents (Dzomba 1997). (Anecdotal information suggests, however, that some hunting is still being carried out by certain members of the community.)

The constitution stipulates rules for the conservation and management of trees, fish and wildlife that households are obliged to follow if they wish to benefit from wildlife revenues. Those members of the community who violate rules against poaching are excluded from receiving a reward for managing wildlife. These rules are enforced by a team of game scouts employed by the Ward Wildlife Committee. Although the legal rights of community members have diminished with respect to their individual right to hunt animals for their subsistence needs, they have increased with respect to their right to benefit from their collective management of wildlife under CAMPFIRE. On balance, this benefit appears to outweigh the benefits from subsistence hunting for most households. In terms of elephants, this transfer of rights has been of undoubted benefit to all households.

As the benefits from wildlife clearly outweigh the costs, many migrants have been attracted to Kanyurira. In an effort to forestall the 'free-rider' problem, the Ward Wildlife Committee's constitution specifies that households must have lived in the study area for at least five years to qualify for revenues earned from sport hunting. At the time of the World Wide Fund for Nature

(WWF) report (Taylor 1998), only 151 out of the 249 households met this residence requirement. Officially, therefore, only 61% of households were considered to be wildlife managers who qualified for benefits. Since dividends are paid to households, not individuals, a second requirement is that all members must be married. The constitution further excludes from membership those who are divorced, so as not to provide an incentive for households to split up in order to gain two shares instead of one.

Wildlife management activities

The main wildlife management activities include land use planning, fence maintenance, setting of hunting quotas, and the monitoring of wildlife and safari hunting. These activities are carried out by locally employed personnel on behalf of households in the community.

Land use planning is important for laying the ground rules for activities in particular areas. In Kanyurira's first land use plan, developed in 1989, the ward allocated an area of 18 km^2 on the banks of the Angwa River for settlement and agricultural activities, the remainder of the ward being used for wildlife production. The plan was conceived locally and submitted to the council. The high population growth rate (23%), however, has seen pressure build up within the fenced area, causing the depletion of soil fertility. As a result, 26 households decided to move outside the electric fence; a move that necessitated a revision of the land use plan (Dzomba 1998). The newly settled area is about 8 km^2 in extent and is unlikely to substantially affect the ward's income from wildlife, as approximately 95% of the ward remains as wildlife habitat for sport hunting. Future land use in the ward will be driven both by the capacity of the ward to manage immigration and population growth and by the extent to which the productivity of the available arable land can be maintained.

The role of the game guards is to monitor safari hunting and enforce local level natural resource by-laws relating to wildlife. Game guards also monitor wildlife populations for quota setting purposes. The hunting quota represents an estimate of the number of animals that can be sustainably harvested from a particular wildlife population (Taylor 1998). Because more than 90% of wildlife revenue is earned from sport hunting, the objective of the quota is to estimate the number of animals that can be safely harvested without diminishing the sustainability of sport hunting in the future. Consequently, the quotas for sport hunting, expressed as an 'off-take' percentage, are usually well below the net growth rate of the population. The off-take of elephant, for example, is between 0.5 and 0.75% per annum, while the growth rate is about 5% per annum. Because the number of animals on the quota directly affects the income earned, quota setting has become a pivotal activity under CAMPFIRE (Taylor 2001). A participatory quota setting methodology has been developed, which allows qualitative and quantitative data inputs from all stakeholders.

Since 1996, the Kanyurira Ward game scouts, in conjunction with WWF and the Ward Wildlife Committee, have been developing a systematic, locally based ground-counting programme. Each month pairs of game scouts traverse a set of predefined transects and record the numbers seen per unit of time on patrol (elephants/effective patrol time); the numbers seen per unit of time

on specific transects set up for the purposes of estimating wildlife numbers;and, in conjunction with the safari operator, the trophy quality. This information is analysed and stored by the scouts in the ward. Currently the information gathered is only sufficient to develop an index of abundance of wildlife populations in the ward. However, these results are used by the Ward Wildlife Committee at the annual quota setting workshop. Table 1 illustrates how, in 1998, this information was used in conjunction with other methodologies to assess the quota requested for elephant for 1999. More importantly, it highlights the need to have locally based information against which other sources of data can be triangulated, such as the aerial wildlife surveys carried out by WWF and the Department of National Parks and Wildlife. These diverse but complementary data sets are analysed in a workshop environment using a participatory quota setting methodology (WWF 1997, 2001; Taylor 1998). The recommendations from this workshop are submitted to the Department of National Parks and Wildlife for verification, which then sets hunting quotas for the council. These procedures and guidelines, as well as the steady growth in elephant numbers, have contributed to Zimbabwe's substantial share of the global market for sport hunting of elephant. The recurrent cost of monitoring activities is approximately 20% of recurrent expenditure, or 6% to 10% of total income.

The Ward Wildlife Committee is also responsible for maintaining the solar-powered electric perimeter fence. For this purpose it employs locally trained fence maintenance staff. Since adopting wildlife as a primary land use in the ward, an electric fence has been erected (with financial assistance from donor agencies) that now protects two of the three villages from wildlife. The installation of the fence has substantially decreased the incidence of human injuries as well as crop and livestock damage. As most residential and cultivated areas are confined by the wildlife fence, practically all sport hunting is carried out in the woodland area that is held in common.

Table 1. The results of the participatory quota setting exercise in Kanyurira Ward 1998

	1998 quota	Ground count	Aerial survey	Trophy quality	Community estimates	Requested quota for 1999
Elephant (male)	4	↑	↓	↑	↑	4
Elephant (female)	15	↑	↓	n/a	↑	12

Source: Rigava personal communication.

Key:

↑ Increasing population
↓ Decreasing population

Support for wildlife management

In 1992, representatives of government and non-governmental organisations (NGOs) formed an advisory committee, headed by the CAMPFIRE Association,

known as the CAMPFIRE Collaborative Group. While the CAMPFIRE Association represents the interests of those rural district councils that have been granted Appropriate Authority, the other NGOs in the collaborative group offer technical support and services to councils and wildlife producer communities responsible for implementing CAMPFIRE.

There has been considerable outside support for the Guruve Rural District Council and the Kanyurira Ward Wildlife Committee under CAMPFIRE—mainly by NGOs who have relied heavily on donor assistance (Table 2). Financial support has enabled the erection of wildlife fencing, while training, technical backup, and workshops have been held under the auspices of the CAMPFIRE Association.

Table 2. Technical support and services provided by government representatives and NGOs to councils with Appropriate Authority

Agency	Technical support and services
CAMPFIRE Association	Lead agency in the CAMPFIRE Collaborative Group; provides a secretariat for members and represents them regionally, nationally and internationally
Department of National Parks and Wildlife Management	Provides an enabling framework for the national wildlife industry and sets sport hunting quotas
Ministry of Local Government, Rural and Urban Development	Supports rural district councils that have been granted Appropriate Authority
ACTION	A local NGO that develops and provides educational and training material for wildlife producer communities
Africa Resources Trust	Promotes the sustainable use of natural resources at a domestic, regional and international level
Centre for Applied Social Studies	Socio-economic research on community-based natural resource management
World Wide Fund for Nature	Ecological and economic support and training of councils and wildlife producer communities
Zimbabwe Trust	Development of community-based organisations and institutions to manage their own natural resources

Source: Bond 1999.

Note: The political and economic turmoil in Zimbabwe, since the study was carried out, has seen the withdrawal of international assistance and the demise of the campfire programme.

In 1992, WWF, through the Support to CAMPFIRE Project, initiated a 'participatory technology development' approach in three selected communities in the Zambezi Valley, including Kanyurira. This approach was designed to develop sustainable and rigorous methods of natural resource and project management by the communities themselves. Through the project, Kanyurira benefited from infrastructural development (fencing, workshops, etc.) as well as through intensive training and extension courses for the community.

These contributions where supplemented by the sustained efforts of Professor Marshall Murphree and his colleagues at the Centre for Applied Social Sciences at the University of Zimbabwe, who carried out a number of studies on the local management of wildlife resources (Cutshall 1989; Nabane and Matzke 1996; Murphree 1997).

The Zimbabwe Trust provided organisational development and institutional support to the Ward Wildlife Committee through its process-oriented monitoring system and by persuading the council to devolve greater powers to the committee. In addition, various donors, most prominently the United States Agency for International Development and the Norwegian International Development Agency, have funded community facilities (grinding mill, store) and projects (ploughing, transport), while Ingwe Safaris have contributed significantly to general community welfare from providing meat and ferrying the sick to buying ploughs and supplying a diesel tank. This support, and the financial benefits that have accrued from wildlife management, has helped effect a complete change in attitude and behaviour of the people of Kanyurira towards wildlife (Dyson 1998). The political and economic turmoil in Zimbabwe, since the study was carried out, has seen the withdrawal of international assistance and the demise of the campfire programme.

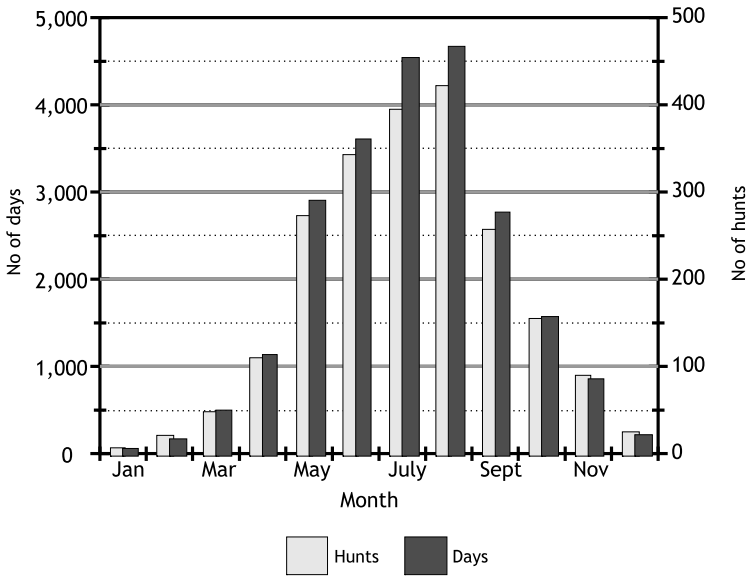
SPORT HUNTING OF ELEPHANT

When CAMPFIRE was first introduced to Guruve, the council decided to involve itself directly in managing the sport hunting lease, an experiment which proved both inefficient and expensive (Jansen 1990). As a result, in 1991, the council put the hunting lease out to tender, which was won by Ingwe Safaris, an experienced private hunting safari company that subsequently had its contract extended in 1997. In 1998, Ingwe Safaris were operating with a staff contingent of 30, all men, including four professional hunters. Under the terms and conditions of the contract, the council granted Ingwe Safaris the exclusive right to hunt wildlife within a prescribed area (Guruve South and East), which includes Kanyurira.

The value of the hunting lease is based on the type, number and value of animals that may be taken in a particular area. This 'hunting quota' is set by the Department of National Parks and Wildlife based on the counting and monitoring of wildlife. Once it is satisfied that a particular number of animals, including elephant, can be hunted on a sustainable basis, the department issues the council with a hunting quota. However, in terms of the council's agreement with the safari operator, this quota is transferred to Ingwe Safaris. Finally, the safari operator, through international marketing, sells a 'hunt' to foreign clients, usually from Europe and America. Each hunt will last from one to three weeks, during which time the hunter (client) will pay to shoot a number of different animals (trophies) listed on the hunting quota. The client pays two fees, the price of the 'trophy' (the animal hunted) and the 'daily rate', or the cost of hunting, which includes transport, accommodation, professional fees, etc. While tuskless female elephants are sometimes shot, mature bull elephants are most highly prized by sport hunters.

Although elephant can be hunted throughout the year, the main hunting season stretches from May to September, when 79% of elephant are taken

Figure 2. Total number of hunts and hunting days



(Figure 2). Only a very small proportion (1.5%) of the mature elephant population is harvested in any one year. This translates into 10% of the annual increment in the elephant population (Martin and Thomas 1991). The impact of sport hunting on the overall elephant population within any given area is therefore very low.

Typically, after an elephant has been shot and killed by a hunter, and the requisite photographs have been taken, the elephant's tusks (the trophy) are removed. However, clients often claim the feet and panels of the hide as well. In Kanyurira, the safari operator is obliged, under terms of his contract, to make the meat available to the community. Depending on where the elephant is shot, people are either transported to the carcass or it is butchered and the meat transported to a central distribution point. Members of the Ward Wildlife Committee or their employees ensure that the meat is equitably distributed among households.

In terms of the lease agreement the council receives 40% of the gross earnings generated from sport hunting by the safari operator. The council, in accordance with the principles of the CAMPFIRE programme, then pays the Ward Wildlife Committee a portion of the hunting revenue received from the safari operator. In Guruve, approximately 70% of the revenue that accrues to the council is disbursed annually to the producer wards. The ward in which the animal was shot receives the trophy fee for the particular animal, plus a proportion of the daily rates. The major part of the revenue that is retained by the council goes towards the management of wildlife, and a smaller portion (usually about 15%) is retained as a management levy. Finally, it is the responsibility of the Ward Wildlife Committee to distribute the revenue equitably (as 'dividends') to all registered households within the Kanyurira

community. These benefits come either in cash or in the form of development projects, such as a clinic or school, as a reward for managing their wildlife resource and an incentive to continue doing so. They also represent compensation for the opportunity that households forego by not using the wildlife areas for agricultural purposes (mainly cropping and grazing), and as compensation to the 'producer community' for the costs they must bear for losses they suffer to their crops and property as a result of damage by wildlife.

THE MARKET

Sport hunting in Zimbabwe

Zimbabwe has been active in the international market for sport hunting since its independence in 1980, and has seen this market expand considerably over the last 10 years. The total annual revenue earned from sport hunting rose from approximately US$2.4 million in 1986 to over US$20 million in 1998 (Figure 3). During the same period, the annual average trophy fee paid for elephant increased from US$2,600 to US$9,600 (Figure 4). Zimbabwe has garnered 48% of the world market in sport hunting of elephant. Its closest competitors, Botswana and Cameroon, hold 21% and 10%, respectively. By using the Convention on International Trade in Endangered Species and Wild Fauna and

Using CITES quotas for ivory as a proxy, and given the gross estimated value of an elephant of US$16,229, the total value of the CITES quota is estimated at US$13.6 million. (See Appendix 1 for tables of estimations of these values.) However, CITES quotas are seldom fulfilled. In Zimbabwe,

Figure 3. Sport hunting revenue (1984-1998)

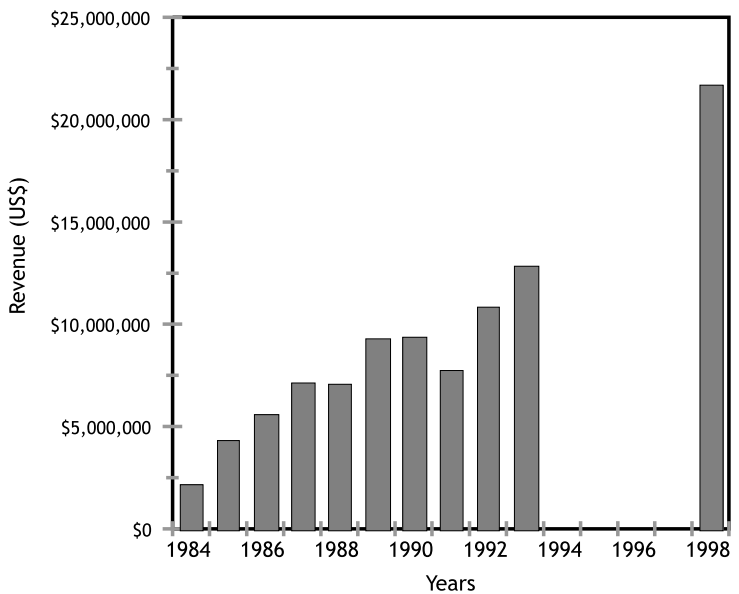
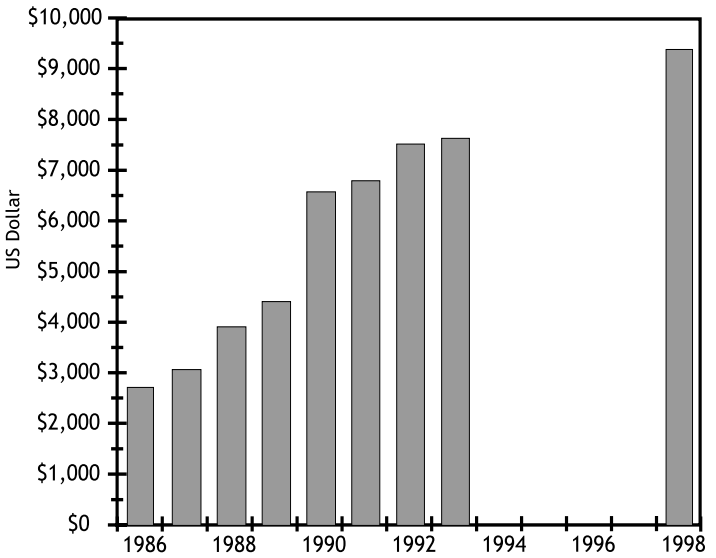


Figure 4. Trophy Fee for Elephant (1986- 1998)



for example, only 270 elephants out of a possible 400 were taken in 1998, and Mozambique has banned elephant hunting altogether. If it is assumed that only 75% of quotas are used, a figure closer to US$10 million would represent a more realistic estimate of the world market.

Much of this revenue growth is underpinned by the cultural understanding and marketing strategies of local white safari operators about European and American imaginings of the 'African wildlife experience' and the 'Great White Hunter', romanticised by Earnest Hemmingway and epitomised by films such as *Out of Africa* and Clint Eastwood's *White Hunter, Black Heart*. Safari operators of European descent therefore have a sociocultural advantage over their black counterparts in terms of their ability to tap into international marketing channels and compete for clients. Another constraint to entering the sport hunting market is the high capital costs of establishing a business as a safari operator, notably the need for reliable four-wheel-drive vehicles and to pay for hunting quotas.

Sport hunting is supported by the Zimbabwe Association of Tour and Safari Operators (ZATSO), the Zimbabwe Tourism Authority, and by the Department of National Parks and Wild Life. ZATSO promotes the interests of its members, such as Ingwe Safaris, by lobbying government ministers, negotiating with government, and drafting a code of conduct, rules and guidelines members are expected to follow in order to promote professionalism within the hunting subsector. On the marketing front, the association publishes an annual handbook with information on hunting and its members, and it participates in Safari Club International shows on behalf of its members.

Safari operators are required to pay a 2% tourism levy to the Zimbabwe Tourism Authority, a statutory body. The authority has supported the

international marketing of sport hunting by sponsoring visits of hunting journalists and by its contributions towards paying for the ZATSO stand at the annual shows of Safari Club International.

The government also provides indirect support through the Ministry of Mines, Environment and Tourism. More specifically, sport hunting is one of the responsibilities of the Department of National Park and Wildlife, which played a key role in establishing CAMPFIRE during the 1980s and, later, in the down-listing of elephants at the CITES convention. This allowed limited trade in ivory and maintained the quota of elephant that could be hunted. Over the last 10 years, however, state involvement in sport hunting has steadily declined. This is partly attributable to economic reform policies and the transformation of the department into a statutory fund. It may also be due to the scarcity of government revenues and because the private sector and NGOs have become increasingly involved in sport hunting. Nonetheless, the Department of National Park and Wildlife still plays a crucial role in setting hunting quotas and controlling hunting activities.

CONCLUDING REMARKS

If Appropriate Authority had not been devolved to the council, there would not have been the rationale for maintaining a large proportion of Kanyurira as wildlife habitat. As a result of this change, the people of Kanyurira have benefited economically at the district, community and household levels. Thus, while substantial improvements can still be made to CAMPFIRE, the net effect of the policy changes has been positive.

One area that requires resolution is the struggle for proprietorship between the producer community and the council over the management of wildlife. The community's weak proprietorship over wildlife and control over the benefits derived from wildlife is reflected in the high variability in revenue paid to the ward (Bond 1999). For example, the incorporation of additional agricultural land in the Ward Wildlife Committee's 1998 land use plan was contested by the council (Taylor 1998), which then refused to pay the ward its wildlife dividend. As a result, fence minders were not paid and the wildlife fence fell into disrepair.

Other cases of this dependency and lack of proprietorship are illustrated by the selection of the safari operator and the setting of quotas. In 1997, the final selection of operators was done by the council's Finance Committee, without any representation from Kanyurira's wildlife committee. (In 1995 during a participatory evaluation of the agents of change in the ward, the incumbent safari operator was identified as the 'most important agent of change'.) In the case of quota setting, the community had decided not to increase the 1997 quota, despite evidence that elephant populations were increasing, yet the Department of National Parks and Wild Life ignored these recommendations and set the quota at higher levels.

Although these examples illustrate the underlying contradiction between the community's relatively weak proprietary rights compared to its wildlife management responsibilities, there are indications of change. The Secretary for Mines, Environment and Tourism announced in July 2000 that the devolution

of the CAMPFIRE programme to the subdistrict level should result in communities receiving 80% of total earnings from wildlife management.

Despite this change, there is a need to recognise the limitations of what programmes such as CAMPFIRE can deliver. Given the low labour and technological intensity of managing wildlife, there is only limited scope for increased production and employment opportunities based on utilising the wildlife resource. Moreover, there is a strong demand for agricultural land in the communal areas that enables households to earn and control incomes on which their livelihoods depend. This demand for agricultural land has fostered a persistent migration into the mid-Zambezi Valley. The subsequent loss of wildlife habitat continues to cast a shadow over the future of sport hunting and those who benefit from it.

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ENDNOTES

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APPENDIX 1

Table A1. Estimation of the value of one elephant (Kanyurira)

Total daily rates (US$)	Total Trophy fees (US$)	Trophy fee for elephant	Percent of daily rate -ex elephant	Actual daily rate - ex elephant (US$)	Estimated gross value of an elephant (US$)	Income to RDC (40% of gross income)	Income to producer ward (70% of income to RDC)
3,598	12,980	10,500	81%	2,911	13,411	5,364	3,755
13,300	20,200	10,600	52%	6,979	17,576	7,030	4,921
14,400	21,000	10,500	50%	7,200	17,700	7,080	4,956
Mean value of an elephant					16,229	6,491	4,544

Table A2. Estimate of global market for the sport hunting of elephant

Country	CITES quota (animals)	CITES markets share	Calculated average value	Gross value	Assuming 75% of quota hunted
Botswana	180	21%	16,229	2,921,220	2,190,915
Cameroon	80	10%	16,229	1,298,320	973,740
Mozambique	10	1%	16,229	162,290	no hunting
Namibia	75	9%	16,229	1,217,175	912,881
South Africa	43	5%	16,229	697,847	523,385
Tanzania	50	6%	16,229	811,450	608,587
Zimbabwe	400	48%	16,229	6,491,600	4,868,700
	838	100%		13,599,902	10,078,209

Sources used for illustrations

Chapter 2: *Garcinia kola*, based on a photo by Paul Latham, from "Photos of Flowers and Plants from Bas-Congo" (http://club.euronet.be/luc.pauwels/GarcKola.JPG)

Chapter 3: *Prunus africana*, redrawn from a botanical illustration by Margaret Stone, published in Beentje, H. (ed.) Flora of Tropical East Africa, Royal Botanic Gardens, Kew

Chapter 4: *Harpagophytum procumbens*, based on photos by Rachel Wynberg

Chapter 5: *Cassipourea flanaganii*, redrawn from a botanical drawing by Tony Dold

Chapter 6: *Vitellaria paradoxa*, redrawn from a botanical illustration by Margaret Stone, published in Beentje, H. (ed.) Flora of Tropical East Africa, Royal Botanic Gardens, Kew

Chapter 7: *Garcinia kola*, based on a photo by Paul Latham. Flowers and Plants from Bas-Congo (http://club.euronet.be/luc.pauwels/GarcKola.JPG)

Chapter 8: *Dacryodes edulis*, drawn from a botanical specimen, Bogor Herbarium

Chapter 9: *Azadirachta indica*, drawn from a botanical specimen, Bogor Herbarium

Chapter 11: *Afzelia quanzensis*, based on photos by Piet Van Wyk, published in Van Wyk, Braam and Van Wyk, Piet (1997) Field guide to trees of southern Africa. Struik, Cape Town.

Chapter 12: *Pterocarpus angolensis*, based on photos by Piet Van Wyk. Van Wyk, Braam and Van Wyk, Piet (eds.) 1997. Field guide to trees of southern Africa. Struik, Cape Town.

Chapter 13: *Acacia seyal*, based on a photo by Ken Cook from Plant Creations Inc. (http://www.plantcreations.com)

Chapter 14: *Hyphaene petersiana*, based on photos by Phosiso Sola

Chapter 15-17: *Laccosperma secundiflorum*, drawn from a botanical specimen

Forest Products, Livelihoods and Conservation

Case Studies of Non-Timber Forest Product Systems

VOLUME 2 - AFRICA

Non-timber forest products (NTFPs) provide important sources of subsistence, income and employment everywhere there are forests (and sometimes even where there are none). With new emphasis on poverty alleviation and livelihood improvement in national and international development agendas, this group of products seems to offer means to increasing welfare in an environmentally sound way. And yet, despite more than a decade of research and targeted development projects, systematic understanding of the economic behaviour of NTFPs, and their role and potential in conservation and development, remains weak.

To help fill this gap, a large group of researchers combined efforts to compare and contrast individual cases of commercial NTFP production, processing and trade from throughout Asia, Africa and Latin America. The cases represent a range of product kinds, geographic, biophysical, social, and economic conditions. As a part of the research process, the cases were described in narrative reports.

This book, along with the companion volumes, presents the full set of 61 cases from Asia (Vol. 1: 21 cases), Africa (Vol. 2: 17 cases) and Latin America (Vol. 3: 23 cases). The reports are organized to present a standard set of information to support comparative analysis, but the authors also included rich detail, idiosyncrasies and analyses of issues and opportunities in their own cases. Individually, the cases provide a wealth of interesting and useful information. Collectively, they offer an invaluable resource for researchers, development practitioners and conservation workers interested in understanding the links between commercialisation, livelihoods and forest conservation.

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