

## Chapter 7

# A case study of *Garcinia kola* nut production-to-consumption system in J4 area of Omo forest reserve, South-west Nigeria

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Common names	Part of the resource used	Management	Degree of transformation	Scale of trade	Geographic range
Bitter cola, Orobo	Seeds	Wild/managed	Low	National	Medium

### ABSTRACT

This chapter sheds light on the importance of bitter kola (*Garcinia kola* Heckel) as one of the many non-timber forest products that are of socio-economic importance in the J4 area of the Omo Forest Reserve of south-west Nigeria. Its commercialisation in both the domestic and national markets raises the standard of living of those involved in its trading activities, both in the rural and urban centres. Trade of bitter kola is more profitable than trade in other non-timber forest products such as wonder cola (*Bucchozia coriacea*), sponge (*Acanthus montanus*) and cola nuts (*Cola nitida/acuminata*). This is because of its high amenability to storage, both fresh and dried.

The ongoing increase in commercial value of bitter kola has made the cultivation of the tree more important—and of greater interest—to the villagers of the J4 area of Omo Forest Reserve. The development of domestication processes to reduce the time to fruit bearing age, coupled with improved marketing opportunities, should improve bitter kola production.

### INTRODUCTION

Studies of non-timber forest products (NTFPs) have shown the importance of NTFPs' contribution to the rural socio-economy of many developing countries. Among many others, such studies include those of Falconer (1990, 1992), Ndoye (1995), Townson (1995), Adebisi (1997), Ndoye *et al.* (1998) and Shiemo (1999).

The contributions of these scholars to the study of NTFPs provide the basic and rudimentary answers to the following questions:

- a. How do NTFPs generate revenue?
- b. What are the qualitative and quantifiable expression and figures for a variety of NTFP in their areas of endemism?
- c. How does each NTFP contribute to the socio-economic development of a particular area?
- d. What are the results and economic advantage of trade and commercialisation of an individual NTFP within local, national, region and global consideration?
- e. How can the quality and yield of an NTFP be improved, and what are ways to increase the adoption of these steps among farmers?
- f. What are the major constraints to the commercial development of the individual product from cottage to large-scale commercial levels?
- g. How can government policy be influenced to promote sustainable cultivation, harvest and trade of these NTFPs like other agronomic crops, such as *Cola nitida*?
- h. What are the steps necessary to promote international trade of NTFPs and to provide effective packaging systems for long distance marketing?

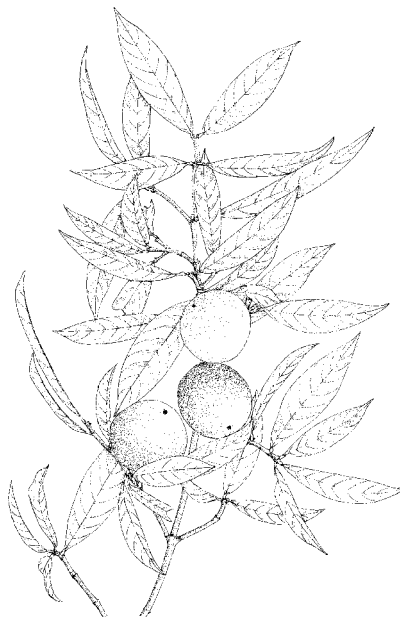
These studies have helped to raise awareness of the contributions of NTFPs to household economies and the security of food and health. However, specific data on the contribution individual NTFPs make to a particular area, or to the national economy, have been scant. Previous reports have been descriptive and effective in highlighting the need to promote detailed studies of individual NTFPs. Now NTFPs have joined the globalisation trend in real research and development and this has been made possible by the Centre for International Forestry Research. CIFOR has set the pace in promoting acquisition of relevant data for the development of these NTFPs for sustainable production.

## IMPORTANCE OF *GARCINIA KOLA*

*Garcinia kola* Heckel nuts, otherwise known as 'bitter kola', have suffered neglect in the areas of research and development. Despite its socio-economic and cultural importance, few attempts have been made to improve the tree species or to reduce the 10 to 15 years it takes to reach seed and fruit production.

An important and ancient trade product, the nuts of *Garcinia kola* are available in markets throughout West and Central Africa, from Senega town in Sierra Leone to south-west Cameroon (Isawumi 1993). In Nigeria, its trade is as important as that of cola nut (*Cola nitida* and *C. acuminata*) in major towns and cities in the southern parts of the country, where the tree is endemic.

Bitter kola is favoured by the three major ethnic groups in Nigeria, the Yoruba, Igbos and Hausa. Its domestic trade thus extends beyond the southern production areas to the northern parts of the country. Apart from being a stimulant, it has in chewing a bitter astringent and resinous taste and is often used as an aphrodisiac. Its highly valued perceived medicinal attributes, and the fact that consumption of large quantities does not cause indigestion (as cola nuts do), make it a highly desired product (Dalziel 1937).



(*Garcinia kola*)

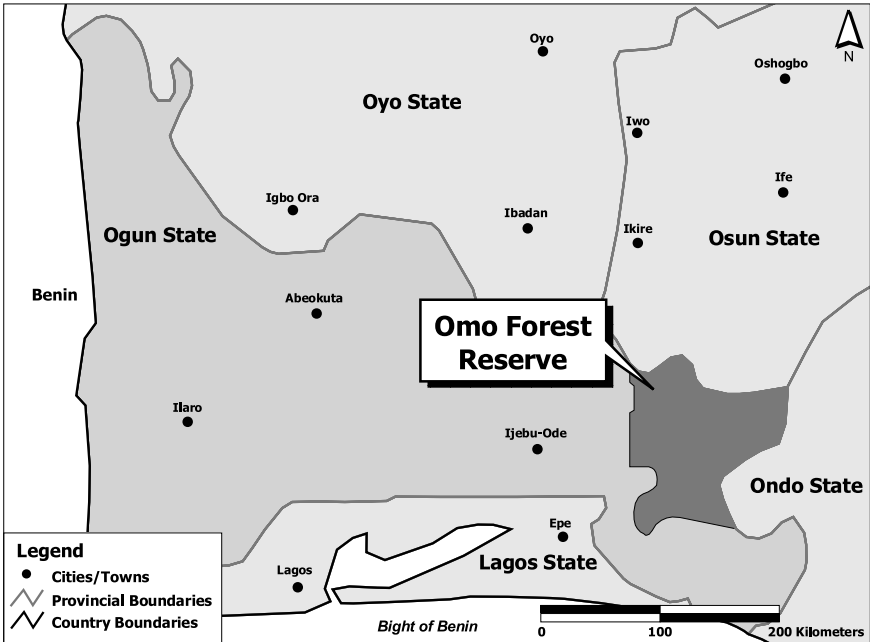
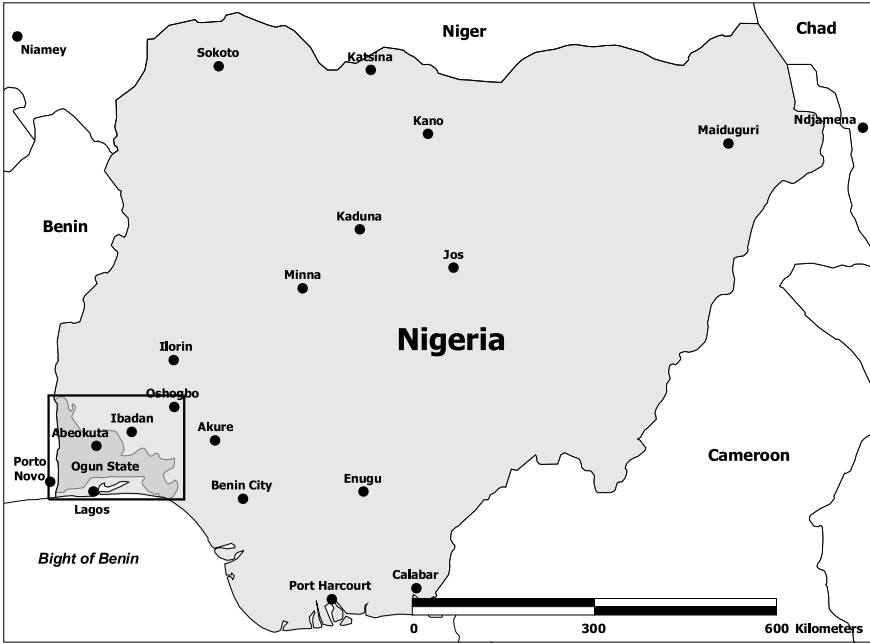
*Garcinia kola* is endemic in the humid lowland rainforest vegetation of the West and Central African subregions. It is found in coastal areas and lowland plains up to 300 m above sea level with an average of 2,500 mm of rainfall per annum. The trees are abundant in densely populated areas of natural and secondary forests where the predominant land use system is tree crop plantation farming (Aiyelaagbe and Adeola 1993). As well, people residing in or near forest reserves collect bitter kola fruits, extract and process the seeds and trade them. Therefore the major places where the commodity is found growing wild are forest reserves and free areas of the rainforest, or it is either planted or conserved in on-farm oil palm-cocoa-yam plantations. These two growing regions will be found in low altitude areas with annual rainfall of 2,000 mm to 2,500 mm, temperature ranges from 32.15°C to 21.4°C and a minimum relative humidity of 76.34% (Ntamag 1997).

For this particular case study, a camp was established in the J4 area of Omo Forest Reserve, Ogun State, Nigeria (Figure 1). This area was selected because the collection and trade of bitter kola is an important contributor to local household per capita income.

### **Cultural importance of bitter kola**

Bitter kola holds a high position of cultural importance among all the Nigerian tribes, particularly the Yoruba and Ibo communities. The Yoruba use bitter kola as an important component of the material used in traditional naming and marriage ceremonies, while the Ibos use it in their traditional 'fetish'

Figure 1. Omo Forest Reserve



Source: ESRI Data and Maps 2002.

recipes. Traditional herbalists use bitter kola in various pharmacopoeia preparations for various ailments (Adjanouhun *et al.* 1991).

### **Impact of bitter kola production on the livelihoods of J4 Omo Forest Reserve villagers**

The production-to-consumption system of *Garcinia kola* seeds has an obvious positive impact on the households of the J4 communities. In particular its commercialisation has contributed to improving the standard of living of the villagers. The production system of bitter kola is very simple; the fruits are collected and the nuts extracted, washed and stored for later sale. Production costs are minimal. The activity is usually a household affair and most of the income generated through the sale of bitter kola nuts is spent on household commitments such as school fees and materials and contracting out the household work during non-cash crop season, when villagers are able to use their profits to participate in family ceremonies. The extra income derived from the sale of bitter kola is thus important to meeting social and educational obligations for the rural poor from resource farmer to forest dweller (Kabuye 1998).

### **Economic importance of bitter kola**

The economic importance of bitter kola cannot be underestimated, especially in the area of poverty alleviation among rural people. A cursory survey of people involved in the trade of this product established that a substantial amount of revenue can be realised from farm gate to village and urban markets. Table 1 clearly indicates the revenue position from the resource base (J4 area of Omo Forest Reserve) up to the common itinerant vendor on the roadside. The price increases as the commodity changes hands from first degree to third degree traders. Handling costs and other expenses involved in bringing the commodity to market contribute immensely to this increase, but looking at the figures critically demonstrates that the base collectors are at an advantage. Their only expenses are periodic transportation costs from their villages to the Fowowa/J4 Junction market if the buyer could not meet them in their enclaves. The market chain vividly describes the situation. The national, regional, and global statistics for the economic importance of this commodity are yet to be computed.

## **THE PRODUCTION-TO-CONSUMPTION SYSTEM**

### **Resource base of bitter kola**

*Garcinia kola* (Heckel) and its relatives—including *G. livingstonei*, *G. gnetoides*, *G. staudtii*, *G. smeathemannii*, *G. ovalivolia*, *G. brevipedicellata* and *G. manni*—are found in Nigeria as well as generally across the humid lowland plains of West Africa extending from Sierra Leone to Zaire (Vivien and Faure 1996) and Angola (Keay 1989).

All the *Garcinia* species have different uses, using different parts of the plant, depending on the location where an individual is endemic. In the J4 area

**Table 1.** Market price profile for 25 kg basket of  *Garcinia kola*  nuts at J4 farm gate and consumers' markets

Village	Price range, in N (US\$)					Approx. number of nuts per 25 kg basket	Approx. average baskets/season/household
	Farm gate price	Bulk selling	Depot selling	Major retailing	Vendor itinerant of retailing kg basket		
Osoko	500-700 (5-7)	800-1,000 (8-10)	1,200-1,500 (12-15)	1,500-1,750 (15-17.5)	2,000-2,500 (20-25)	2,500-2,800	7
Abeku	500-650 (5-6.5)	750-850 (7.5-8.5)	1,200-1,500 (12-15)	1,500-1,750 (15-17.5)	2,000-2,500 (20-25)	2,700-2,800	3
Olooji	550-700 (5.5-7)	800-900 (8-9)	1,300-1,600 (13-16)	1,500-1750 (15-17.5)	2,000-2,300 (20-23)	2,400-2,600	5
Idi-Egun	600-700 (6-7)	700-800 (7-8)	1,000-1,300 (10-13)	1,300-1,500 (13-15)	1,750-2,000 (17.5-20)	2,000-2,300	3
Aberu	n.a.	n.a.	n.a.	n.a.	2,300-2,500 (23-25)	2,560-2,800	5
Fowowa	n.a.	n.a.	n.a.	1,400-1,600 (14-16)	2,000-2,500 (20-25)	2,500-2,700	2
Mean	537.5-687.5 (5.37-687)	762-887 (7.62-8.87)	1,175-1,475 (11.75-4.75)	1,440-1,660 (14.4-16.6)	2,016-2,383 (20.16-23.83)	2,443-2,683	3

Exchange rate: US\$1 = N100; n.a. means data not available.

Source: Field survey.

and in Nigeria as a whole, however, *Garcinia kola* is by far the best recognised. Most of the productive trees now found within the range of the J4 villages were left standing when farm plots were cut out of the forest or are transplanted wildlings or volunteers. In Ijebu Division, *Garcinia kola* trees are found in compound or homestead farming systems of relatives of villagers living at the J4 study site. It is believed that the species was introduced through the cultivation of wildlings brought home from the Forest Reserve. The quantity and economic value of seed from *Garcinia kola* trees make it an important component tree in compound farming systems in Nigeria, as well as contribute to its conservation value (Aiyelaagbe *et al.* 1996).

As a tropical fruit tree species, it is characterised by slow rate of growth (Ladipo 1995). Factors that have discouraged farmers from growing *Garcinia kola* include difficulties encountered in attempting to raise seedlings in nurseries and the long gestation period before flowering and fruiting. However, many of the germination difficulties have been overcome by methods developed by Okafor (1998), and interest is developing to cultivate the tree species in plantations. With this in mind, Ladipo (1995) has developed projected production figures, as follows. A mature fruit tree produces 85 to 1,717 fruits, with 208 to 6,112 seeds annually. Taking the mean of these values at 834 fruits and 2,627 nuts per tree, he has projected a fruit production of 26 tonnes/ha/annum, with 278 trees/ha at 6 m x 6 m spacing.

Fruiting in the tree commences in July and ends in October. Fruit harvest continues intermittently as ripe fruit fall and are then collected for the extraction of seeds. The fruit is reddish-yellow, about 6.25 cm in diameter, and each fruit contains two to four brown seeds embedded in orange-coloured pulp (Ladipo 1995; Keay 1989).

**Photo 1.** *Garcinia kola* (Photo by T.C.H. Sunderland)



## Bitter kola producers in the socio-economic context

Within the J4 area of Omo Forest Reserve, the villages of Osoko, Abeku, Olooji, Mile 1, Fowowa and Etemi are well known to traders in NTFPs (see Table 2). Apart from the planting of cash crops such as plantain, cocoa, cola nuts and a few arable crops, the collection and processing of NTFPs for sale are a major preoccupation throughout the season. Such NTFPs include *Buchhlozia coriacea* ('wonder cola'), *Copolobia lutea* (Fulani nomadic staff), *Mitragyna ciliata* (Abura; wrapping leaves for cola nuts), bush meat from various game species, bark and roots of various trees, *Acanthus montanus* (washing sponge) and more importantly, the nuts of *Garcinia kola*.

**Table 2.** Distribution of tribes living within the J4 area

Tribe	%	Remarks
Ijebu	60	The landlords (descendants)
Oyo (Ibadan)	10	Cocoa tree crop farming
Ondo	10	<i>Cola nitida/acuminata</i>
Igbo	5	Trade in NTFPs
Hausa	5	Trade in NTFPs and provide labour
Others	10	Food crop farming and trade in NTFPs

Source: Karimu 1999.

The population of J4 has increased in numbers from initial surveys carried out in 1916-18 and 1925 (see Table 3). A survey in 1949-50 recorded a population of about 2,500, a 40% increase. Today it is clear that both the population and number of settlements have continued to expand. For example, Aberu, which was a camp with two huts and 11 people in 1949-50, is presently a large village of about 100 houses and 2,500 people. The village now has a primary school, a rural health centre and a bore-hole well that supplies potable water. Another example is Fowowa Camp. In 1949 it was an insignificant camp, but now it is a popular 'nerve-centre', an assembly point for all other villagers in the J4 area and the seat of the Ogun State Aforestation Programme with a population of about 5,000 in 1997 (Karimu 1999; Ladipo 1999; Ojo 1999). At the time of this study the project manager of the Ogun State Plantation Programme estimated the total population of the J4 area at between 10,000 and 12,000.

**Table 3.** Population growth within J4 area villages

Period	1916-1918	1925	1949-1950	1999
Number of settlements	30	45	100	205
Number of villages	5	20	50	100
Population	610	1,300	>5,000	10,000-12,000

Source: Karimu 1999.



Farming, fishing, hunting and the collection of NTFPs, including bitter kola, are the primary occupations for the majority of the J4 population (Ojo 1999). The average annual household income has been estimated at N70,971.6 (US\$709.72). About 60% of the total land use is in rain fed arable farming, while 18.5% is put to permanent crop trees like cocoa, citrus and cola nuts. Villages in the J4 area produce substantial amounts of plantain and still have extensive forest areas for timber tree exploitation and extraction of NTFPs. This variety of income and food generating activities brings the socio-economic status of the people within J4 above the poverty line. Rough estimates of per capita income for both national and J4 area households are shown in Table 4.

In December 2000, the federal and state governments of Nigeria increased the minimum basic salaries in the civil service to N60,000 and N36,000 (US\$600 and US\$360) per annum respectively. The estimated average per capita income in J4 was between N25,704 and N37,200 (US\$257 and US\$372) per annum. There is not a significant difference between state and J4 area per capita income. However, labour wages within the J4 area are still relatively low compared with larger cities. For example as of December 2000, within the J4 area the labour rate at 15 man-days/ha (weeding operation) was on average N236 (US\$2.36) per day as compared with N400 to N500 (US\$4-US\$5) per day in urban areas.

With these economic returns, the inhabitants of area J4 can expect nothing less than an amiable standard of living. Their interactions with people within and outside the area have been cordial and primarily based on trade activities of NTFPs, cash and arable crops, and plantains and bananas. All these items of trade invite a handsome number of merchants from far and wide to the J4 area. Purchasers are encountered throughout the year, buying various commodities as they come into season. The sales of fresh or dry bitter kola begin in July for onward transportation to big cities and towns like Lagos, Ijebu-ode, Abeokuta and Ibadan, and to some northern parts of the country. Women and children often perform the processing and sale of bitter kola seeds in markets.

### **Processing industry**

The processing and sale of bitter kola is largely a family-based home industry, which, when the product is harvested at sustainable levels, has little negative impact on the mother tree. When ripe, the green pericarp turns a reddish yellow colour, and the fruit falls from the tree. The fruit are collected and kept in an open, cool place till the pericarp and the pulpy mesocarp become soft. Once softened, the fruits are threshed to release the nuts, which are thoroughly washed to remove the sticky mucilaginous material that sheaths the nut. Nuts that are not sold fresh are then spread out and air-dried in preparation for storage, which is provided by wrapping the nuts in leaves and storing them in a basket lined with jute bag material. This process is repeated as fruit ripens and is collected throughout the harvesting period. There is normally no secondary or industrial transformation of the nuts, with the exception of uses in breweries, where bitter kola nuts are further dried and ground into powder before use (Ibanga 1993).

**Table 4.** Crude estimates of per capita incomes within the J4 area of Omo Forest Reserve

	Osoko	Abeku	Aberu	Olooji	Mile 1	Idi-Egun	Fowowa	Mean
Monthly per capita income, in N (US\$)	2,000-3,500 (20-35)	2,000-3,000 (20-30)	1,500-2,000 (15-20)	2,500-3,700 (25-37)	2,000-2,500 (20-25)	2,000-3,500 (20-35)	3,000-3,500 (30-35)	2,142.3 (21,42-31)
Persons per household	4-10	3-10	4-14	3-10	2-10	3-7	2-12	3-10
Average income monthly from all sources, per capita in N (US\$)	6,000 (60)	7,000 (70)	5,000 (50)	8,400 (84)	4,000 (40)	6,000 (60)	5,000 (50)	5,914.3 (59.14)
Average daily labour rate at 15 man-days/ha (weeding), in N (US\$)	200 (2.00)	200 (2.00)	250 (2.50)	200 (2.00)	300 (3.00)	200 (2.00)	300 (3.00)	236 (2.36)

For comparison, national average monthly per capita income in 1996-97 ranged from N189 (US\$2) to N495 (US\$4.6); in December 2000, it ranged from N2,000 (US\$20) to N10,000 (US\$100). Exchange rate in 1996-97: US\$1 = N85; in December 2000: US\$1 = N100.

Source: Field survey 2000.

## Trade and marketing

More often than not, after removing a small quantity for household consumption (including entertainment and medicinal purposes), the processed bitter kola are sold. The nuts selected for sale are usually the neatly processed ones without a scratched nut coat. Fresh, well air-dried and ambiently stored bitter kola commands the highest market price. At the farm gate level, bitter kola nuts are sold to consumers, or collectors may appoint a representative. This person buys the small quantities of nuts brought by collectors, which are then sold at the J4 Junction market in 5 kg, 10 kg or 25 kg basket sizes (Photo 2).

**Photo 2.** *Garcinia kola* nuts in the market (Photo by T.C.H. Sunderland)



The trade and marketing of bitter kola within the J4 production area and its immediate environs are as old as Omo Forest Reserve, and even before that, NTFP collection was a major occupation of the local population. In the last 10 years, however, the trend in the marketing of NTFPs in the study area has expanded through bulk buyers coming from nearby towns and cities. This increasing commercialisation has led to a tremendous expansion of the bitter kola marketing network. This network has evolved as an intricate chain of intermediaries, village traders, wholesalers, and interstate traders, with avenues reaching the consumers at each stage.

## POLICY AND ENVIRONMENT

The formulation of government environmental and conservation policies has been the specialised area of ecologists and conservationists. These policies fit the management of conservation areas into the general policy framework of the government. Thus, the environmental policy has a single objective, conservation, which of course ultimately has influence over the attitude of the government with respect to forest-dependent communities.

When Omo Forest Reserve was created about 100 years ago, it was subdivided for effective management into areas called J1, J3, J4 and J6. Then the subdivisions were apportioned to people already living in the reserve in isolated villages and camps. This was to enable the subsequent effective participatory management approach by the (then) Western State Government of Nigeria. In the J4 area, about 15 villages and camps were demarcated, with specific instructions that farming areas for either arable or cash crops not be expanded beyond the plots originally occupied. Furthermore villagers were instructed that on no account trees be felled without the expressed permission of the Chief Conservator of Forests. The only 'minor forest products' (now NTFPs) the inhabitants were allowed to take included nuts, fruits and probably wild game (for which a hunting permit had to be obtained). These policies are still in force today. Although the forest is ample and few human beings frequent this area, the whole area would probably have been environmentally degraded had there been no such policy. Even so, through government permits, the exploitation of timber trees and clearing for plantations almost two-third of the forest has been degraded to secondary forest. In the process many of the NTFP resources have been destroyed or grossly decimated. For example, in his enumerations conducted in the last four decades, Lowe (1993) estimated the density of *Garcinia kola* trees at 0.5/ha. This relative scarcity has affected the production of bitter kola, and the volume of its trade decreased when compared with that of the early 1960s. However, the trading volumes may increase in the nearest future, as the forest inhabitants are now growing *Garcinia kola* trees using wildlings.

## TRENDS AND ISSUES

### Dynamic changes

In general, the abundance of a NTFP in a particular area where it is endemic is determined by the variation in natural conditions and the degree of human interventions. These determinant factors include government policies and the type and method of harvesting of the NTFP. First and foremost, various government policies may have negative impacts through the destruction of a specific NTFP resource base. For example, the clearing of almost half of the J4 area to establish plantations of *Gmelina arborea* and indigenous timber tree species has had an unfavourable impact on the understorey species that produce abundant NTFPs. These include bitter kola, and many *Garcinia kola* trees that used to produce abundant fruits have been destroyed by the felling of trees and under brushing processes. Current inhabitants of the J4 area can only tell of the past abundance of bitter kola seeds. Their only hope for regaining the past glory of abundant harvest lies in the preciously few replantings and trees already conserved in their cocoa plantations.

The climatic conditions and the physiography of the vegetation of the whole area are now changing, and the human population is increasing. It is unlikely that supply and demand for bitter kola in the production area will ever reach equilibrium. On the other hand, the collection of *Garcinia kola* nut is sustainable as the cycle of flowering to fruiting period is not tampered with when harvesting.

In the J4 area, individual households have particular bitter kola trees from which they harvest without hindrance. The number of trees could be increased by planting *Garcinia kola* wildlings. This has just begun in the last 10 years, when forest inhabitants learned that the tree could be cultivated.

There are indications that there is an accelerated decline in the abundance of *Garcinia kola* trees and other NTFPs in the tropical rainforest of Africa, most especially those that are of socio-economic importance and have long been commercialised. Deforestation and various processes of clearing vegetation have changed habitats, in part as a result of changes in climatic conditions in the past five decades. This, coupled with various intensities of exploitation by stakeholders, has been held responsible for the decline in the abundance of some major NTFPs. The lack of modern, efficient and appropriate processing technologies has contributed to the underutilisation of many NTFPs—and caused great economic loss. The impact of this lack of processing technology is considered to have limited the trade of many NTFPs to domestic markets. For example, trade in bitter kola is still within the domain of domestic and national markets, though regional and international markets are known to exist (although the volume of trade is yet to be ascertained). Furthermore the government of Nigeria has not promoted the production and trade of bitter kola like it has its counterpart, the cola nut, which in the past six decades has been variously favoured and developed to the extent that Nigeria is now one of the biggest producers and exporters of cola nuts. Increasing the production of bitter kola may expand its trade, market stability and add more economic value. The government, multilateral, nongovernmental and private organisations and industrial entrepreneurs should sponsor various programmes and projects to study and support the development of bitter kola. Such efforts could accomplish the desired development in cultivation and improve the tree's slow growth rate, industrial use and overseas promotion of bitter kola trade.

## KEY ISSUES/PROBLEMS

### Decline in forest cover

Nigerian forest covers a total land area of 360,000 km<sup>2</sup> (Bada 1984), 27% of which makes up the forest reserves of the country. The remaining forest cover is regarded as free areas, and it is from these areas that most of the wood requirements of the country have been met. However, as economically valuable species were cleared from the free areas, the forest reserves were exploited. Nigerian forest area has declined greatly because of uncontrolled deforestation.

Although efforts are being made to plant fast growing exotic and indigenous species to replace the overexploited tropical forest, the rate of establishment does not match the rate of exploitation. By 1990, plantations of various species and purposes covering a total of 216,026 ha had been established in various parts of Nigeria, particularly in the forest reserve areas (Omoluabi *et al.* 1990). It is feared that unless something is done, the remaining pockets of tropical forest in Nigeria may have vanished by the end of the twenty-first century (Okojie *et al.* 1988).

## Decline in the value of the standing forest resource

Almost 70% of the bitter kola production in Nigeria stems from natural or secondary forest of the government forest reserves, while just about 30% are from the cocoa-cola farming system production areas of south-western parts and the oil palm-cassava and home or compound garden farming system of the south-eastern part of Nigeria. The entire J4 area is a secondary forest and logged-over habitat of about 59,610 ha in extent; almost half of the area has been cleared for agriculture and forest plantations. The major land use system is rain-fed arable cropping, characterised by swidden fallow and permanent crop plantations of cocoa, cola, and plantain. Apart from this, each village has an average of 13.91 ha of forest for collection of NTFPs. Both commercial timber logging and agricultural clearing in the J4 study area in the recent past have affected the availability of NTFPs, especially *Garcinia kola*.

The abundance and distribution of *Garcinia kola* trees within the study area is highly variable. The density of this species is low, in spite of recent individual planting efforts. Though these efforts, if continued, will contribute to increasing the abundance of the species, they will not immediately contribute to bitter kola production. In addition to the recent plantings, wild seedlings occur in secondary forests, fallow lands and cocoa plantations, but as an understorey species *Garcinia kola* is generally absent in the largely disturbed forest of the study area. The number of *Garcinia kola* trees per hectare has now been reduced from 0.5 to 0.33. The reduction in the number of productive *Garcinia kola* trees has adversely affected the production of bitter kola.

## Need to support domestication of *Garcinia kola* and the development of greater markets

The harvest and collection of *Garcinia kola* nuts has always been sustainable since no parts of the tree are destroyed in the process. However, increased commercialisation could threaten that sustainability if proper care is not taken to ensure the development of new generations of *Garcinia kola* trees with desired characteristics through careful breeding from selected sources. The existing populations of *Garcinia kola*, easy physical access, the high control over access, control of the land and other resources provided by the Ogun State Forestry Department and the dwellers within the J4 study area provide an excellent opportunity to further the development of bitter kola production.

This study has found that a large number of NTFPs within the J4 area are used locally for subsistence consumption, while any surplus is traded in the local markets. Some NTFPs are collected mainly for commercial purposes, among them bitter kola. The level of commercialisation of bitter kola is low because of the tree's scattered presence in the forests, low population densities, and limited marketing opportunities. The development of domestication processes to reduce the time to fruit bearing age, coupled with improved marketing opportunities (as has been done with cola nuts), should improve bitter kola production. With the prospect of more immediate returns on their investment (of time and labour, if not cash), local farmers may be encouraged to introduce plantings of *Garcinia kola*, and thus increase the stocking levels of the species in the J4 area. It is logical that this development

would contribute to local incomes and encourage sustainable forest management.

### CONSERVATION AND DEVELOPMENT LESSONS OF THE CASE

Recommendations of what to do to improve the conservation and marketing of bitter kola in the J4 area of Omo Forest Reserve are made below.

- *Policy for sustainable production and trading of bitter kola.* Appropriate conservation strategies need to be developed based on a baseline inventory of *Garcinia kola* within the J4 area and Omo Forest Reserve in general. This important step will lead to the formulation of management options, which might include production of planting stock through the creation of forest nurseries by the Forestry Department.
- *Income generating activities.* The harvest of bitter kola nuts is primarily for commercial gain. It follows that greater numbers of healthy trees producing nuts will generate greater amounts of income. To foster this development, farming activities that benefit or are compatible with bitter kola tree cultivation should be encouraged. This would include farming activities such as planting cocoa, cola nuts and other NTFP species that have similar growth requirements as *Garcinia kola*. These compatible land use activities are considered important as they increase the revenue realisable from the collection and sale of NTFPs. In corollary to this, fertiliser and improved seedlings should be allowed free entry to promote intensive management and increased bitter kola production.
- *Respect of isolated village population's rights.* Mutual respect for the rights of isolated villages within the Omo Forest Reserve by government agencies and for government rules and regulations by local villagers will promote the management of the forest reserve by the local population. The villagers within the reserve should not be treated as squatters. The original agreements concerning rights to farming, fishing, hunting and collection of royalties should remain, as these are heritable rights. Villagers within the reserve too must abide with the rules and regulations that will guide the sustainable yield and protection of the ecological and environmental being of the whole area. It would behove the government to develop policy and laws for local use jointly with the local people according to their customs and beliefs. Similarly, any review of forestry management policies should favour a bottom-up approach.

In short, the trade of bitter kola and other NTFPs has helped tremendously in the promotion of conservation and the development of socio-economic links and relationships between the isolated village populations of Omo Forest Reserve and project officials on one hand and among all the stakeholders on the other. The afforestation programme in the J4 area brought in infrastructure development that benefits all involved and that is not found in any other part of the reserve. This development includes the provision of potable water, schools, clinics, electricity, and all-weather roads for evacuation of NTFPs, monitoring of projects, collaboration with all stakeholders and a host of other opportunities.

## CONCLUSIONS

This chapter has elucidated the importance of bitter kola as one of the many NTFPs that are of socio-economic importance in the rainforest of south-west Nigeria. Its commercialisation both in the domestic and national markets would result in raising the standard of living of those involved in its trading activities, in both the rural and urban centres. It is clear that through the volume of production each season the bitter kola trade is more profitable than other NTFPs such as wonder cola (*Bulchhoizia coriacea*), sponge (*Acanthus montanus*) and cola nuts (*Cola nitida/acuminata*) in the J4 area. In part because of its high amenability to storage, both fresh and dried, traders' market margins were also found to be higher than those of other NTFPs.

The ongoing increase in commercial value of bitter kola has made the cultivation of the tree more important—and of greater interest—to the isolated villagers of the J4 area of Omo Forest Reserve as well as other bitter kola production areas in Nigeria. The development of domestication and cultivation strategies for improving *Garcinia kola* trees should be possible, as has been undertaken with many other NTFPs.

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## Chapter 8

# Potential for development and conservation of *Dacryodes edulis* in Sakpoba Forest Reserve, Edo State, in the Niger Delta area of Nigeria

*Hassan Gbadebo Adewusi*<sup>1</sup>

Common names	Part of the resource used	Management	Degree of transformation	Scale of trade	Geographic range
Safou, Bush pear, Orumu	Fruit	Managed/ Cultivated	Low	National	Medium

### ABSTRACT

The edible fruits of *Dacryodes edulis* are one of the most important non-timber forest products in Sakpoba Forest Reserve. The species has been cultivated and commercialised in the far west of the reserve for over six decades, with a corresponding trade network stretching as far as Benin City, Sapele, Agbor and Lagos. The 95% majority of *D. edulis* production is obtained from cultivated stands in agricultural fields, agroforestry plantings and compound farms. The remaining 5% is obtained from the wild although considerable variation exists among the wild taxa. Of the cultivated production of *D. edulis*, 80% is from private land and 10% from open access communal land. The average size of producer households is about seven people, about 50% of whom engage in *D. edulis* production and 30% in marketing. Production and marketing of *D. edulis* is on the increase while processing remains unchanged. The road network within the production site is in serious disrepair, deleteriously affecting the movement of product to market. Encouraging the cultivation and commercialisation of *D. edulis* will encourage the selection of superior varieties from the highly variable wild materials. It is hoped that this will in turn increase and ensure the adoption and practice of conservation strategies for the remaining wild genetic resources of the species.

## INTRODUCTION

Various authors have described the contributions of wild fruits, nuts, seeds and vegetables to the African diet and their potential in overcoming or ameliorating the problems of inadequate food supply and nutrient deficiencies among the people, particularly rural dwellers, who are often perceived to be under serious threat of malnutrition (Getahun 1974; Roche 1975; Okigbo 1977, 1978; Okafor 1975, 1980).

A multiple-value trees and shrubs prioritisation exercise conducted for the humid lowland of West Africa (HULWA) by the International Centre for Research in Agroforestry in 1993 indicated that *D. edulis* is one of the preferred wild fruit tree species in the region. It is particularly valued in south-eastern and parts of south-western Nigeria (Adeola *et al.* 1994), ranking just behind the bush mango in livelihood importance.

However, few of the top 10 species in the HULWA region have acquired international recognition, particularly in their importance in the agroforestry system, contribution to income generation of farmers, nutritional values and growing commercial importance locally. Data on local commercial and production trends as well as export earnings from this group of resources need to be collected. This study evaluates the production, uses and commercialisation pattern of *D. edulis* in the Sakpoba Forest Reserve area of Nigeria, with the objective of identifying the potential for harmonising the development and encouraging the *in situ* conservation of the species.



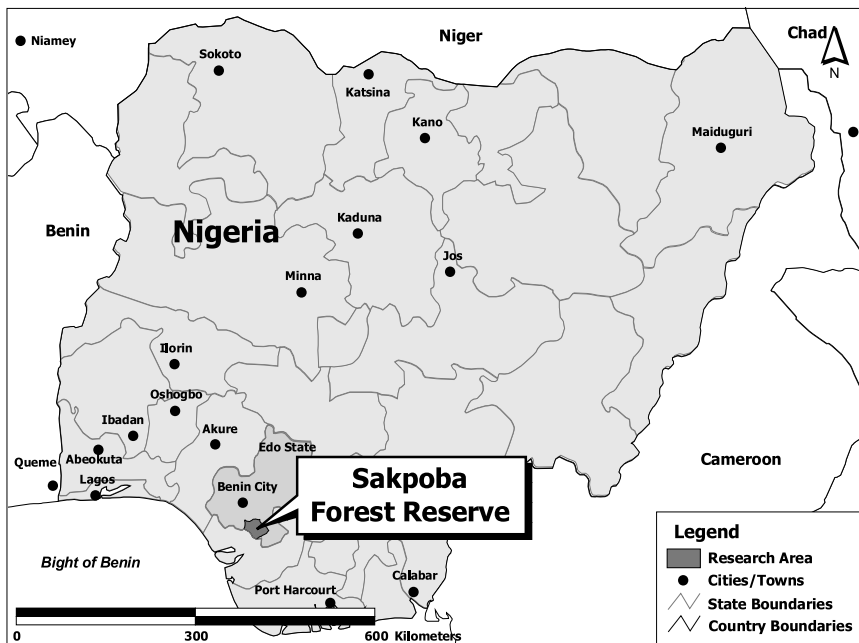
(*Dacryodes edulis*)

## THE PRODUCTION-TO-CONSUMPTION SYSTEM

### Resource base

The Sakpoba (or Sapoba) Forest Reserve (06° 05' N, 05° 52' E) including numerous villages, campsites, and enclaves is situated in Edo State, in the south-south-west area of Nigeria (Figure 1). It is located about 45 kilometres south-east of Benin City and 26 kilometres north-east of Sapele, in the moist lowland rainforest. The entire forest reserve covers an estimated area of 521 km<sup>2</sup> (FORMECU 1998).

**Figure 1.** Location of the study area



Source: ESRI Data and Maps 2002.

Villages within the forest reserve area include Evbuosa, Aideyanba, Igbekhue, Iguemokwa, Ona, Akpobi, Abe, Evbeka, Obozogbe, Evbarkhue and Iduowina (Idu). For this study, Ona village and Akpobi camp with a combined area of 5 km<sup>2</sup> were selected. The population of the two communities is estimated to be around 3,000, representing an average density of 600 persons per square kilometre. The population has increased over the last 10 years, with an average influx of about 50 people annually (Efhsosa personal communication). While the indigenes drift to the urban centres for white collar and artisan jobs, non-indigenes, particularly timber exploiters and non-timber product extractors mostly from the Hausas and the Igbos tribes, constitute the majority of immigrants into the communities (Yesufu personal communication).

The major land use patterns in Sakpoba Forest Reserve are farming (predominantly arable, plantation), *taungya* agroforestry systems and areas set aside for biodiversity conservation and forest regeneration (Table 1). The area was constituted and gazetted into forest reserve by the regional government in 1912. Ownership and authority have changed hands between regional and native authorities several times, but the Edo State government now controls the management of the reserve. Since its constitution into government forest reserve, natives have been granted the privilege to reside and practice sedentary agriculture within approved demarcated areas close to the communities. Traditional communal landowners enjoy the rights to hunt and fish and to access other water resources as well as the right of way along the Sapele-Sakpoba-Igbekhue motor road. Sakpoba Forest Reserve occupies a significant position in forestry practices in Nigeria. Its proximity to Benin City, Sapele and Agbor markets make it an attractive area of continued forest development.

**Table 1.** Predominant land use pattern in Sakpoba Forest Reserve

Land use system	Area (km <sup>2</sup> )	Percentage of total area(%)
Rain-fed arable	20	4
Irrigation arable	0	0
Permanent crops	104	20
Pasture	5	0.96
Swidden fallow	5.2	1
Forest	160	30.6
Urban/settlement	2	10.804
Marshy/swamped	26	5

Source: FORMECU 1998.

Settlements in the Sakpoba Forest Reserve used to be served with good motorable roads totaling about 320 kilometres (Table 2). The perennial rivers used for transportation include the Jamieson and Ossiomo rivers. The main Agbor-Sapele and Sakpoba-Idu roads were constructed in 1926 and 1940, respectively, and timber exploiters have constructed various short log-extraction routes. These roads are in terrible states of disrepair and available for product extraction and transportation to major markets only during the short dry period of the year.

The forest/vegetation type is moist evergreen lowland rainforest. This zone is characterized by a potential evapotranspiration ratio of between 0.125 and 2. The average annual rainfall ranges between 1,000 mm and 3,000 mm, while the mean daily temperature is about 24°C. The climatic classification of the recorded production area according to the Köppen system falls within the rainy climate with or without dry season winter. The temperature of the coolest month is above 18°C. It is constantly moist, and rainfall in the driest month is not less than 60 mm (UNEP 1995).

**Table 2.** Transportation network around Sakpoba Forest Reserve

Roads	Distance (km)	Status
Roads and rides	160	Fairly well motorable
Agbor-Sapele road	160	Complete state of disrepair
Sakpoba-Benin road	45	Partly paved, other parts not motorable in rainy season
Total	365	

Despite its high value and the nutritional and economic importance of *D. edulis* to the socio-cultural life of the people of the area, monocropping or plantation development of the species is rarely found. Instead small stands are randomly planted in a complex agroforestry system of compound farms, home gardens and outlying farms. The present production stocks of the species are old, while the juvenile ones, expected to commence production soon, are from protected on-farm growth wildlings or from lifted wildlings planted within the compound agroforestry complex. Irrigated farming is not practised in the Sakpoba Forest Reserve area because of the nearly year-round constant moisture availability and very short dry period (Table 1).

The major item of commercial interest is the fruit of *D. edulis*. The current source of the fruit is predominantly from semidomesticated stands in home gardens and tree crop farms, and rarely from the wild. The tree has been delimited into two varieties, namely, *D. edulis* var *edulis* and *D. edulis* var *parvicarpa*, based on fruit traits identified by Okafor (1983). Recent germplasm exploration studies, however, indicate wide variability within the fruit, particularly in colour (especially after ripening), size, shape and mesocarp thickness (Omaliko *et al.* 1998). Although seven distinct fruit shape types are recognised, four fruit types are consistent enough to be applied. These are ellipsoid, oblong, cylindrical and spindle shapes.

*D. edulis* fruit is consumed as food supplement. It is eaten either raw, roasted or boiled, usually between meals, particularly together with boiled or roasted maize, during the 'hungry season' when staples are yet to mature and become ready for consumption (Okafor 1983; Emebiri and Nwufu 1990). The edible portion (mesocarp) is protein rich (between 9% and 12%) (Emebiri personal communication) and has a good amino-acid balance (Omoti and Okiy 1987). The fruit yields about 48% edible oil, which is rich in unsaturated fatty acid (44%) (Ucciani and Busson 1963). This is relatively stable, satisfactorily nutritional and compares favourably with other major widely used vegetable oils (Ucciani and Busson 1963; Osagie and Odutuga 1986; Omoti and Okiy 1987). After oil extraction the cotyledon, or kernel, can be fed to sheep and goats. In addition to the edible fruit, the resin obtained from the bark is variously used as sealing pitch on calabashes and for mending earthenware. The wood from *D. edulis* is used for making tool handles, axe shafts, mortars and in carpentry. Various parts also have cure for a variety of ailments.

**Photo 1.** Fruit of *Dacryodes edulis* (Photo by H.G. Adewusi)

While fruit harvesting *per se* does not kill the tree, roasting or boiling the fruit for consumption has deleterious effects on the seed embryo. However, Okafor and Okolo (1974) reported that germination was obtained with such seeds. The intraspecific variations found in the trees and fruits (Okafor 1983; Omaliko *et al.* 1998; Kengue *et al.* 2002) are clear indications of high prospects for conservation. These include extending the period of fruit availability, increasing the range of products and yield as well as choice of desirable traits, pattern and season of yield. The shelf life is generally less than a week (Aiyelaagbe *et al.* 1998), but it can be prolonged beyond eight days through refrigeration (Okafor 1990). Under ambient conditions, some genotypes stay beyond the normal period before deteriorating, a desirable trait for selection of cultivars (Leakey 1999). Okafor (1990) reported an inverse relationship between fruit length, mesocarp thickness and shelf life.

Okafor (1998) has successfully budded *D. edulis*, however, with some difficulty because of the resinous exudates that makes cambial unification between rootstock and scion difficult. Okafor (1998) advocated the adoption of apical decapitation method, with similar advantages as in budding. However, marcotting has been successful on *D. edulis* in Nigeria. This has similar advantages as budding and decapitation. *D. edulis* is known to germinate easily from seed, with over 80% cumulative germination between 10 and 21 days after sowing (Okafor 1998).

The dietary contribution of *D. edulis* is enhanced because of its season of availability, the 'hungry season' (Okafor 1998) when most staples such as yam, cocoyam and rice are not mature. Potential commercial or industrial products



obtainable from *D. edulis* include cooking (edible) oil and margarine, soap manufacturing and pharmaceutical preparations (Okafor and Okolo 1974; Udeala *et al.* 1980; Omoti and Okiy 1987).

Using data from two independent forest enumerations, Okafor (1993) found that per hectare between 0.21 and 0.4 trees of *D. edulis* were present in the wild. This is a very low density, compared with *Irvingia* spp., *Pentaclethra macrophylla* and *Chrysophyllum albidum* among other high priority indigenous fruit trees. However, in the traditional farming systems over three *D. edulis* trees per hectare have been observed (Okafor 1993). Based on this and on an average fruit yield of 223 kg to 335 kg per tree, an annual fruit yield per hectare of 7 tons to 10.5 tons has been recorded (Omoti and Okiy 1987). In a similar vein, other studies recorded an oil yield of about 16 tons per hectare, twice the production capacity of oil palm (Emebiri *et al.* 1993). Most farmers' holdings consisted of an average of four trees per farmer (Adeola *et al.* 1994).

In the absence of monocrop or plantation farming of *D. edulis* in this area, the current source of the fruit is predominantly from compound farms and agroforestry plots. This accounts for about 90% of the total production. Trait preferences for domestication of *D. edulis* as suggested by respondents (Adeola *et al.* 1994; Aiyelaagbe *et al.* 1998; Okafor 1999) have been documented; these include bigger fruits, creamier fruits, thick mesocarp, small seeded fruits, short and early producing varieties. These traits could increase production and probably encourage monocrop cultivation of *D. edulis*, if improved materials were available. The percentage contribution to the entire production by the habitat/forest types showed that primary, disturbed primary and secondary forests contributed about 5% (at 1%, 2% and 2%, respectively). Agricultural fields also make a significant contribution (5%). These fields, primarily devoted to arable crops productions, have scattered fruit trees retained, hence are distinctly different from any agroforestry system.

Fruit availability in the market is expected by late May and could last until October in most cases, therefore providing a five-month harvesting period, however the effective harvesting may last only four months (June-September). Fruiting periodicity variations have been observed across the distribution range (Kengue *et al.* 2002). Off-season genotypes/cultivars are also available and their fruits ripen tardily between November and January (Okafor 1979). In Rivers State, with a swamp ecology, a fruiting period from May to June has been recorded; in Abia State, with a rain forest ecology, from May to October; in Anambra State, with a forest-savanna transition ecology, from June to November (Aiyelaagbe *et al.* 1998). Wider variation may occur in a drier environment. Access to the forest may be hampered during the peak of the rainy season (July-September) because of the terrain.

Since most lands carrying *D. edulis* are in the mixed or intercrop status, the best alternative use of the land—whether for monocrop production of *D. edulis* or other uses—has not been determined. Rubber (*Hevea brasiliensis*) and oil palm (*Elaeis guinensis*) are the common plantation crops in Sakpoba Forest Reserve. Although production is obtained from all categories of land tenure, the percentage distribution is as follows: private land, 80%; state land, 5%; communal land, 5% and open access, 10%. If these land types were rented out, the annual rent would be US\$49 per hectare. The sale price for a hectare of similar land is

US\$490. The government, however, charges US\$10 per annum as concession fee for the extraction of non-timber forest products (NTFPs).

Unlike most NTFPs, the harvesting of *D. edulis* fruits does not involve physical removal of individual trees, but the propagules are removed and carried away from the production site. Okafor (1998) asserted that wild *D. edulis* trees could reach reproductive maturity in 10 to 15 years, although pruned cultivated trees have fruited within three years and unpruned cultivated trees could take five years before fruiting (Aiyelaagbe *et.al.* 1998).

Like most tree growth and production, the trend of fruit production is expected to increase with age, before declining. Aiyelaagbe *et al.* (1998) reported a significant decline in production after 60 years. Since the majority of the current stock of production is old and improved varieties of the species are uncommon, the population of *D. edulis* in the production area may be declining.

### **Raw material producers and socio-economic context**

The average household size in Ona and Akpobi villages is seven people, no fewer than 40% of them engaged in *D. edulis* production. The average annual household income in Sakpoba Forest Reserve is about US\$500, a little higher than the national average of US\$490. Close to 40% of the annual household income is integrated into the cash economy of the communities. Fifty percent of household members are involved in production, while only 30% are involved in marketing. The average annual income of *D. edulis* producer households in the study area is US\$650 with 5% contribution from *D. edulis*. These household collect other NTFPs as well, including *Xylopiya aethiopica*, *Garcinia kola*, *Irvingia gabonensis*, *Irvingia wombulu*, *Piper guinensis*, *Aframomum melagueta*, *Pentaclethra macrophylla* and *Treulia africana* among others. NTFPs production continues to be on the increase, and producers enjoy medium class status within the community.

The contribution of *D. edulis* to the rural economy is primarily based on the income it generates through fruit sales, but the total amount of cash that exchanging hands is difficult to ascertain. Likewise, the value of such a product is unquantifiable. For example, the leaves and seed kernels are useful as animal feed and the species has other cultural uses such as to portray hospitality or hostility to visitors in certain parts of Iboland (south-east Nigeria) and for oracle divination (Okafor 1979).

Fruit collection, both in the wild and on planted farms, is labour dependent. The labour requirement for collection and packing of a 100 kg bag is about three man-days (Adewusi personal communication). Unlike in the introduced cash/industrial monocrop or plantation crops such as cocoa, coffee, kola and cashew, where there are producers' association, there are no established producers' groups for the majority of indigenous fruits. Individual farmers may belong to various co-operative societies and non-governmental institutions such as the Farmers' Development Union or the Farmers' Association of Nigeria, yet specific crop or farm produce associations are rare among farmers. Informal associations may exist, however, among the brokers and distributors who trade in the fruits. Using the level of participation of farmers in similar societies,

particularly co-operative ones, there is high optimism for widespread participation among all the stakeholders in *D. edulis* production, if such organisation were to exist. The non-existence of a formal producing organisation makes it difficult to establish guidelines for entrance of new members. The land tenure system could be one of the major constraints to recruiting new members into the production system; similarly, the capital outlay of produce buying may restrict new entrants into the distribution system as well as diversified business of stakeholders.

### **Processing industry**

The current degree of transformation of *D. edulis* to finished product is low, i. e., the fruit is eaten without any value added. However, when extractives (oil, resin etc.) are obtained, the transformation may be high. The proportion of farm produce to finished product currently remains total (100%). Other species with value similar to *D. edulis* are *D. klaineana* and *Canarium schweinfurthii*. However, no synthetic substitute is known at present. Experience with other fruit trees showed that vendors employ labour to harvest at peak periods, similar method are not known to be employed for *D. edulis*. Current knowledge only indicates the use of family labour in the sequential harvest, and this is not often costed. At present, little or no technology is used in the processing of *D. edulis*. The technologies being developed and used in studying the potential industrial uses of natural products at the Products Research and Development Agency (PRODA) in Enugu, Nigeria, the Federal Institute for Industrial Research Oshodi (FIRO) in Lagos, Nigeria, and the Food Technology and Food Sciences Departments in Nigerian Universities and Polytechnics should be adopted and improved upon.

### **Trade and marketing**

The trade of *D. edulis* in Nigeria can be described as ‘cash and carry’. Daily paid workers within the National Agricultural Research System currently earn US\$2.5 per day (N100 = US\$1 at the official rate of exchange). However, at Sakpoba—an oil producing area—the average daily wage range is between US\$4 and US\$5 depending on the nature of a job and labour availability. The farmers in addition provide transportation and a mid-day meal. Labour charges are higher in the oil producing areas of the Niger Delta.

An annual yield of 1,500 to 10,000 fruits per mature tree, with a corresponding cash income of about US\$75 to US\$150 has been recorded for *D. edulis* (Okafor 1990). In the same area (the Niger Delta), an economic evaluation by Aiyelaagbe *et al.* (1998) reported an annual yield of 8 kg to 110 kg per tree, depending on tree age. This represented an average cash income of about US\$0.03 to US\$0.75 with a yield of 20 kg to 50 kg per tree (Aiyelaagbe *et al.* 1998). The price in local currency of *D. edulis* continues to increase steadily, particularly in the off-seasons and years of poor production. However, the differences in the above economic evaluations stem from variations in assessment period and rate as well as rate of inflation. The income accruing to the household from the trade may continue to increase, but inflation and declining value of the national currency continue to obscure this trend.

An average of 12 producers were observed to trade *D. edulis* in local markets per period (day), with an average of 37.5 twenty-five kg bags or baskets per market period. During the peak period, a bag or basket sold for between N95 and N170 at the farm gate and increased to N100 to N160 at the depots. Iguemokwa market recorded the highest number of producers (22), while Ona market had the least (10). In a similar vein, producers traded more quantities of *D. edulis* in Iguemokwa market, while few baskets were traded in Iduowina market. Accessibility and proximity to markets may be one of the factors responsible for the observed pattern.

In the absence of official or documented records, interviews and interactions with elders in the community provided clues that introduction of *D. edulis* into the local marketing system may have occurred after the introduction of exotic fruits like citrus, mango and cashew. Wide acceptance, requests from people outside the production zone and dwindling resources may be some of the factors responsible for its commercialisation and subsequent introduction into the marketing system. Therefore *D. edulis* may have been traded for over 50 years in the Sakpoba area.

## Policy environment

From the wild *D. edulis* is obtained from government reserves and communal lands, and no individual is granted the authority to change the land-use pattern or sell such lands. Private landowners, however, have the right to use their land as they deem fit. Not much land has been granted to rubber plantation development, to discourage incursion into forestland particularly in the *taungya* plots. All the community members are aware of the customs that govern the utilisation of common properties, except perhaps indigenes born outside the community who later settled in the village. State and customary laws have been harmonised, and where there is conflict, state interest overrides. Within the communities, the majority of producers are not single-commodity producers. Locally they have medium to high level status, probably depending on the educational level, while nationally they belong to the low socio-economic stratum.

The national agricultural policy includes the policy on the forestry sector, yet government rights on forest reserves are primarily restricted to timber extraction. Villages within reserves retain the right to extract non-timber forest resources without obtaining permission from the forestry department. The government monitors the movement of forest produce between states, with much emphasis on wood products (timber, poles, firewood etc.). The state forestry department charges a quarterly permit fee of US\$2 per head for minor forest produce, including *D. edulis*. Vehicles that carry forest produce are charged US\$10 per annum. Within the communities, all members regulate the method of NTFPs collection to ensure the sustainability of the produce. The lack of control of NTFPs by the government has allowed the communities to exercise indigenous wisdom in the management of such resources. This method has indirectly ensured sustainability in the production through non-collection of immature materials. *D. edulis*, like other NTFPs, responds to regulations governing such commodities. Private ownership of farmlands with

*D. edulis* ensures uninterrupted control on the management of the produce. Since the export potential of *D. edulis* has only recently been recognised, no state regulation governs its production. The Nigerian Export Promotion Council is however encouraging the exportation of non-oil products, particularly agricultural and forest products. The Raw Material Research Council of Nigeria is currently working on available local sources of raw materials for different industries. Tax exemption for locally sourced materials could be another incentive for the use of NTFPs, and *D. edulis* occupies a strategic position in this regard.

Two members of the National Agricultural Research Institutes (the National Horticultural Research Institute and the Forestry Research Institute of Nigeria); the Forestry Commission, Enugu; the botany, forestry, agricultural sciences and food technology departments of most Nigerian universities, particularly those within the humid lowland ecological zone, are provided with facilities and the mandate to carry out research on non-timber forest products in general, including indigenous fruits. In a similar vein, PRODA, FIIRO, and the Raw Material Research Council of Nigeria are being sponsored to develop industrial products from NTFPs, including *D. edulis*.

The non-inclusion of the contribution of certain NTFPs in the national and states food balance sheet, despite their importance in the informal economy, was highlighted by Olayide *et al.* (1972). This situation has remained unchanged. The Federal Office of Statistics in Nigeria is yet to include the contribution of NTFPs to the national economy in its database.

## TRENDS AND ISSUES

### Dynamic changes

Despite the recognised economic importance of *D. edulis* in farming as well as in the nutrition of the people, the majority of studies of the species have focussed on the biology, socio-cultural or ethnobotany, physico-chemical properties and industrial potentials of the species (Emebiri and Nwufo 1990; Emebiri 1993; Ejiofor and Okafor 1997; Okafor 1975, 1979, 1980, 1983, 1998a, b). However, the need to select and breed for improved varieties for effective domestication is critical. These should also include the selection of germplasm for multiplication and conservation of the genetic resources for immediate and future needs.

An improvement in the production, processing and marketing of *D. edulis* in Sakpoba Forest Reserve will better the living conditions and enhance the status of the producers. This will have multiplier effects on the conservation of the available wild materials, including the wild relatives. Since the *D. edulis* fruit has been traded for years in the study site, its global commercialisation will encourage more cultivation.

### Key issues/problems

With about 95% production from cultivation and 5% from wild collection in the case study area, understanding the proportional contribution of wild gathering

and cultivated harvesting to the national production system will form the basis of the global contribution.

The amount of labour required and the cost implication for *D. edulis* production in Sakpoba Forest Reserve indicated its low input requirement. The majority of production has been found in the tree-crop interaction systems, which poses little or no problem to the ecology. In the absence of regional gross domestic product figures, it was difficult to estimate the regional or local per capita income.

Our experience in Sakpoba Forest Reserve in the last 10 years indicates a serious degradation of the natural forest, the major cause being timber exploitation. This has negative effects and impact on non-timber forest resources, particularly among natural regenerated and understorey species. The verification exercise carried out in 2001 revealed the degree of degradation and extent of deterioration of infrastructural facilities within the reserve in the last 10 years. The major roads have become impassable, especially during the peak of the rainy season when the species of interest (*D. edulis*) is supposed to be brought to market.

## CONSERVATION AND DEVELOPMENT LESSONS OF CASE

### Lessons

*D. edulis* has enjoyed local and national commercial importance for over six decades. Widening the market for the product, particularly capturing its export potentials and selection of a genotype acceptable to international markets, will enable producers to look inward, into the available genetic resources in the wild. Conservation of these genetic resources will enhance the future ability of producers to participate in and respond to the international trade of the commodity, while continuous development to meet the standard set by the markets will be a priority issue.

Trade in *D. edulis* has benefited all the stakeholders from the villages in the reserve to those involved in the market chain. Organized production and marketing strategies will further benefit and encourage rapid socio-economic development of the producing communities. The current system of harvesting the species is not detrimental and it is sustainable. The available information on yield is insufficient, and farmers are unwilling to disseminate such information in order to avoid taxation. However, detailed studies on the production per tree and per hectare will provide useful information on yield. Current production is insufficient to satisfy the local demand. Producers still manage their old stock and regeneration occurs mainly through wildlings from existing stock.

The slow growth of indigenous fruit trees and longer time required to produce fruit, compared with exotic species, has seriously influenced the demand for planting materials among poor rural farmers. Increased commercialization of *D. edulis* is expected to be an incentive for increased interest in further selection and improvement in the species. This should be backed with supply of improved planting materials. This will encourage the conservation of wild stock and further selections can be made from that.

Increased commercialization without corresponding stock improvement would put high pressure on stock available in the wild; harvesting or production techniques may become unsustainable. This would further negate the conservation procedures already put in place, both by the government and the local community.

## Conclusion

*D. edulis* has attained elevated status among indigenous fruit trees of the HULWA, hence the increased interest in its domestication and commercialization. With the current knowledge on status and economic and conservation potentials of the species within the study site, *D. edulis* will be better appreciated and efforts increased towards its increased utilization and conservation.

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## ENDNOTES

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## Chapter 9

# The woodcarving industry in Kenya

*Simon Kosgei Choge*<sup>1</sup>

Common names	Part of the resource used	Management	Degree of transformation	Scale of trade	Geographic range
Mahogany, Muhu	Wood	Wild	Medium	International	Medium

### ABSTRACT

Woodcarving provides one of the most important uses of wood in Kenya both in terms of economic returns (export value of carvings estimated at over US\$20 million annually) and generation of self-employment opportunities (about 80,000 carvers who are breadwinners for over 400,000 family members). As an informal sector economic activity, the woodcarving industry has continued to attract a large number of unemployed people. Its enormous growth in terms of the number of people engaged in the industry and the extent of spread in the country is causing a major conservation problem through depletion of limited stocks of highly favoured tree species among other socio-economic and management challenges. This chapter describes the organisation and conduct of the woodcarving industry in Kenya, delineates the nature of the challenges facing it, and highlights the probable pathways through which the industry may be sustained.

### INTRODUCTION

Woodcarving in Kenya is one of the forest-related enterprises with a fascinating history dating back to 1919 (Elkan 1958; Troughear 1987). Since then the industry has gradually expanded over the years to become one of the largest handicraft industries in the country, and arguably in Africa, worth over US\$20 million<sup>2</sup> annually in value of exported products and being a vital source of livelihood for tens of thousands of carvers and hundreds of thousands of extended family members (Obunga unpublished; Choge 2002). While it is impossible to obtain accurate figures owing to the dynamic nature and spread of the industry, extensive surveys carried out in the mid-1990s showed that the number of active carvers then was between 60,000 and 80,000, supporting over 400,000

dependants (Obunga unpublished). The growth of the industry is strongly correlated to the arrival of rising numbers of European settlers and missionaries (1920s and 1930s), British soldiers (1940s and 1950s), tourists (1960s to date) and the expanding international market for Kenyan carvings<sup>3</sup>.

Although carving is practised by all linguistic groups in Kenya, the Wakamba people are most successful at commercial woodcarving in the country. Wakamba carvers have established a well-organised structural industry of wood producers, carvers and marketing agents, most of whom are bound by close ties of extended families and clans. Much of the landscape traditionally occupied by the Wakamba is dry savanna, with limited prospects for agricultural development. As a result, woodcarving remains an important and popular economic occupation option.

Woodcarving is considered an informal sector economic activity in Kenya. The sector covers all small-scale activities, usually semi-organized, unregulated and using simple labour intensive technologies. A large proportion of the unemployed in Kenya join the expanding informal sector, which includes woodcarving. For example in 1999, an estimated 1,705,400, persons in Nairobi, Eastern Province and Coast Province (the prevalent woodcarving areas of Kenya) were engaged in the informal sector with an annual increase of about 11% (GOK 2000). Although the industry is considered informal, woodcarvers have formed co-operative societies in different parts of the country following encouragement by the government shortly after independence in the early 1960s. Presently six major woodcarving co-operatives exist. They came together in 1982 to form a union to further their ideals and interests. However, the large size of the industry and other internal and external factors are posing new administrative and management challenges discussed elsewhere in this chapter.

Besides the emerging administrative challenges associated with the enormous growth of the industry in Kenya, it is increasingly posing a major conservation problem through depletion of highly favoured tree species from their existing natural habitats. Nationally, over 15,000 m<sup>3</sup> of wood is used by the industry per year, a rather small volume considering the large number of carvers. However, the devastating impact of the industry on favoured tree species can be understood when one considers that only a narrow range meet the desirable carving qualities. These include hardwoods such as *Brachylaena huillensis* O. Hoffm (muhugu), *Dalbergia melanoxylon* Guill. & Perr. (ebony/mpingo), *Olea europaea* L. var. *africana* (Mill.) P. Green (olive/mutamaiyu), *Spirostachys africana* Sond. (mutanga) and *Combretum schumanii* (mkongolo). The overexploitation of these species is further complicated by their slow growth rates and limited recruitment potential under natural conditions (Choge 2002). The widespread depletion of traditional carving woods has led to increased utilisation of alternative species such as *Azadirachta indica* A. Juss (neem), *Jacaranda mimosifolia*, *Mangifera indica* (mango), *Terminalia brownii* Fresen., *Grevillea robusta* (mukima) and others.

Owing to the shortage of woodcarving raw materials and limited market outlets for carved products within their native areas of occupation, the Wakamba carvers have responded to these constraints by gradually moving hundreds of kilometres to other forest and savannah areas, particularly to the Kenyan Coast Province, the geographical focus for this case study.

## STUDY AREA

The case study area is the region between Kilifi and Malindi districts, around Arabuko Sokoke Forest Reserve, which remains the main source area of *Brachylaena huillensis* and *Azadirachta indica*, currently the two most extensively utilised<sup>4</sup> species in the Kenyan woodcarving industry (Figure 1). Kilifi and Malindi districts cover an area of 12,483 km<sup>2</sup> (1,248,300 ha), out of which the study area covers about 92,000 ha (Arabuko Sokoke alone occupies some 41,000 ha), with a population of 312,000 (Mogaka 1991; GOK 2000).

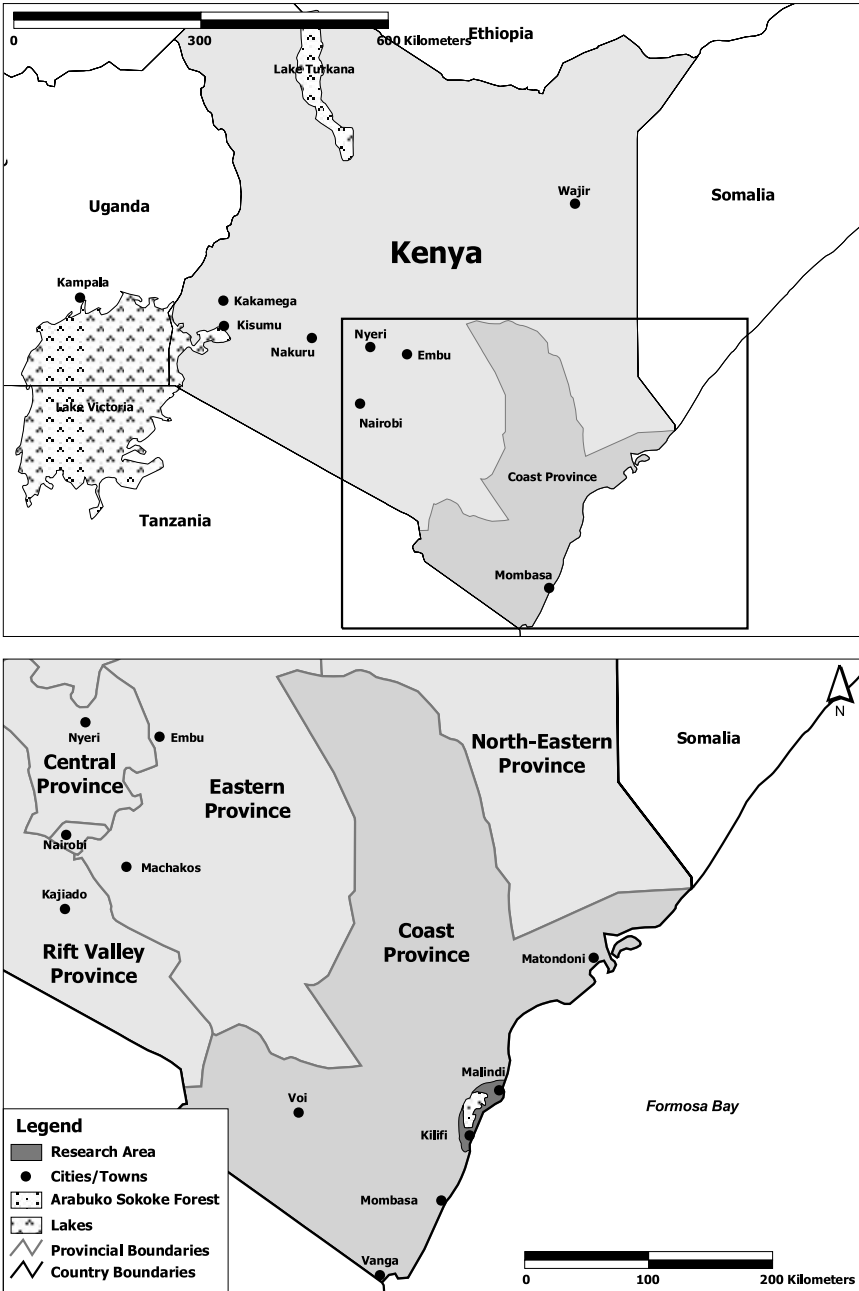
The region has a monsoon type of climate. It is hot and dry in December to May, while the coolest months are June to August. The mean minimum temperature rarely falls below 25°C. Rainfall, ranging from 900 mm to 1200 mm annually, is characterised by a bimodal pattern with long rains during March to June and short rains in November and December (GOK and UNICEF 1990). The area lies within a major cropping zone with fertile soils. The major crops cultivated are maize, coconut, cashew nut, mango, sorghum, cowpea, sweet potato and vegetables. Livestock production is also common.

The area is inhabited by the Mijikenda linguistic group but has been able to accommodate the immigrant Wakamba within their traditional lands and nearby urban areas. Although they are not woodcarvers, the Mijikenda act as raw material producers and facilitators, and hence their contribution to the woodcarving industry, directly or indirectly, is significant.

## METHODS

The findings of this chapter are based on detailed studies of the woodcarving industry in Kenya (Obunga unpublished; Choge 2002) conducted under the People and Plants Initiative jointly funded by World Wide Fund for Nature, UK; the United Nations Educational, Scientific and Cultural Organisation; and the Royal Botanic Gardens, Kew. The study entailed determination of prices of raw materials along the marketing chain (from source to final user), determination of wood volumes by tree species entering the carving market and the products' respective sizes. In addition, the study also documented the competing uses of carving wood where unit prices of each use were determined for uses such as firewood, charcoal production, poles and sawn timber. This was undertaken to guide policy formulation towards more economical utilisation of scarce wood resources in Kenya. Woodcarving returns per unit, labour and profit margins were also determined aimed at identifying the critical stages in the carving process, which require some form of training or other necessary intervention measures towards optimisation of resources and profit maximisation in the light of wood scarcity. Policy reforms covering all these areas were advanced, including the overall structural setup and co-ordination of the industry for a more enabling environment and holistic approach towards the development of a sustainable woodcarving industry in Kenya.

Figure 1. Map of the case study area



Source: ESRI Data and Maps 2002.

## THE RESOURCE BASE

### *Brachylaena huillensis*

Arabuko Sokoke Forest Reserve is the main source of *Brachylaena huillensis* to woodcarvers within the study area and beyond. It is the last remaining tract of lowland forests in Kenya (MENR 1994). Within Arabuko Sokoke Forest Reserve, *Brachylaena huillensis* occurs on deep and well developed red volcanic clay loam soils and is closely associated with *Cynometra* vegetation types, of which two discrete populations in the forest are found. From the forest formations where *Brachylaena huillensis* are found, wood volumes are estimated at 2.7 m<sup>3</sup>/ha in trees of size above 30 cm diameter at breast height, 50% of which is assumed to be suitable for carving (KIFCON 1991). In addition, the recruitment potential in these areas was also found to be healthy with over 2,500 seedlings per hectare (KIFCON 1991). However, a rapid decline in numbers of mature *Brachylaena huillensis* trees through overexploitation for carving is the most serious conservation threat. Although the recommended sustainable annual extractable volume of the species from the forest was estimated at 47 m<sup>3</sup> in the late 1980s and early 1990s, licensed extraction of over 400 m<sup>3</sup> and illegal harvests of over 2,100 m<sup>3</sup> were observed, at which rate the species could be exterminated from the forest in about 17 to 25 years (KIFCON 1991). Better enforcement of policing and protection of the forest in the late 1990s led to controlled harvesting. For example in 1998 to 2000, about 340 m<sup>3</sup> *Brachylaena huillensis* round wood was extracted annually from the forest (Choge 2002).

*Brachylaena huillensis* is a dioecious tree pollinated by insects. The flowering period tends to follow the rainy seasons and rainfall quantity determines whether the tree will flower or abort the young developed flower buds (Albrecht 1993). Seed viability is extremely low (2%-10%) and is completely lost after six months of storage at room temperature (Kigomo 1989; Albrecht 1993). In natural

**Photo 1.** The raw material (Photo by S.K. Choge)



conditions, seed germination is enhanced under conditions with little or no forest floor litter. Areas with substantial litter require unusually high amounts of rainfall for successful germination, conditions which rarely occur naturally and which would require human intervention in order to maximise the recruitment potential.

### ***Azadirachta indica***

The use of *Azadirachta indica* for woodcarving is a fairly recent phenomenon. The wood was discovered accidentally as other favourable species were getting more difficult to obtain. The climatic conditions along the Kenyan coast are well suited to the growth of the species and *Azadirachta indica* is now widely spread in the region<sup>5</sup>. *Azadirachta indica*, an open pollinated tree species, has high abundance, fast growth and high regeneration within the study area. It offers excellent prospects for sustainable utilisation and support to the woodcarving industry. It is naturally dispersed by birds, animals and humans, making it an important vegetation component on farmlands, private compounds and cemeteries within the study area. It is widely regarded as a weed because of its profuse regeneration particularly in disturbed areas where food crops are grown. A recent survey and inventory of *Azadirachta indica* along the coast showed mature tree densities varying between six trees per hectare and 0.2 trees per hectare as well as high recruitment potential ranging from over 1,000 seedlings per hectare to 100 seedlings per hectare (Choge and Mbuvi unpublished).



(*Azadirachta indica*)

The initial popularity of *Azadirachta indica* in Kenya was largely due to its curative attributes, hence the common Kiswahili name by which the tree is known, *mwarubaini*, which means 'reliever of 40 disorders'. Other than in the carving industry, the wood is used for house construction, in the furniture and soap making industries and as cooking energy. In 1998 to 2002 an estimated 200 m<sup>3</sup> of *Azadirachta indica* wood for carving was traded per year within the study area, but the volume has since increased (Choge 2002).

## RAW MATERIAL PRODUCERS

As traditional inhabitants of the study area, the Mijikenda are the main producers and suppliers of carving raw materials traded to the Wakamba carvers, who mostly reside in Malindi town. Although trading in woodcarving raw materials is common, the Mijikenda mainly depend on crop production to meet economic and social obligations (Mogaka 1991; Maundu *et al.* unpublished). Coconut-based products such as coconut oil, juice, brew, thatching material, baskets, mats, house sweeping brushes and building poles are probably the most popular locally traded products and remain the leading source of income for most households within the study area. The income from traded products, including carving wood, is generally low, ranging from US\$4 to US\$40 (mean of US\$18.5) per capita with a wide disparity in amounts of income per households despite the similarity of sources (Mogaka 1991). Generally, trading in carving wood is not a hugely profitable undertaking to producers because of exploitation by agents and availability of cheap wood mostly stolen from the nearby state forest and communal woodlands. In addition, waste *Azadirachta indica* wood at construction sites in urban areas is common, harvesters obtaining the wood for free if they clear an area of trees.

The annual volume of carving wood from the study area is estimated at 807.5 m<sup>3</sup> worth US\$10,093.75 (based on producer prices), about 331.1 m<sup>3</sup> of which is used within Malindi and 476.4 m<sup>3</sup> is taken to carvers outside the study area, mainly to Mombasa (Choge 2002). Benefits from these sales are therefore thinly distributed among the many producers.

## THE PROCESSING INDUSTRY

Woodcarving is an extremely labour intensive activity. A recent study (Choge 2002) shows that although the woodcarving industry in Kenya consumes over 15,000 m<sup>3</sup> annually, representing 0.7% of the total round wood market share in Kenya, the revenue that accrues from the woodcarving industry represents about 25% of the total revenue from the commercial timber industry whereas the woodcarving labour accounts for more than 40% of the formal timber industry labour in the country.

Within the study area and elsewhere in Kenya woodcarvers usually work together in large groups or co-operatives to share tools and experiences and profit from the convenience of receiving bulk raw material supplies and marketing of the products. Carvers are experienced in carving only certain products. For example, those experienced in carving animal shapes such as lion, rhino and buffalo do not carve those of giraffes, masks, bowls and spoons.



The different niches of the carving market are therefore easily met by different members within the group. Certain stages of carving such as filing, sanding and painting require the services, for a fee, of highly experienced members specialised to perform those operations.

**Photo 2.** Processing (Photo by S.K. Choge)



Within the study area about 15 groups exist with memberships ranging from 10 to 700 members. Five groups are located within Malindi town alone. The rest are dispersed all over the study area mostly in villages surrounding Arabuko Sokoke Forest Reserve for easy access to the source of carving wood. They construct temporary sheds in which they carve for several days and then take the semifinished products to Malindi for finishing and sale to tourists and other buyers.

Once delivered to the carving centre, the wood is cross-cut and split to the desired sizes. The individual components are then transformed into standardised animal, human figure, spoon and bowl shapes, or anything else desired by the market, using narrow bladed adzes, files, knives and other tools for precision carving. A completed carving is filled to refine the shape, sanded to smoothen and painted or polished to make it shine and more appealing. In a typical woodcarving centre or group of carvers working together 2% split the wood, 60% do the actual carving, 10% do the filing, 20% perform sanding and 8% perform the rest of the operations such as polishing, painting and wiping the finished carvings.

Most of the carvings made are polished with clear varnish to make them shine brightly, even those from woods with good grain patterns such as *Dalbergia melanoxylon*, *Combretum schumanni*, *Olea europaea*, *Brachylaena huillensis*. Use of black polish is often associated with faking, making carvings from alternative woods look like those from a more desired species, which usually have the characteristic of black heartwood.

The distribution of costs was found to be the cost of wood (30%), splitting and cross-cutting of wood (5%), filing of carvings (8%), sanding (30%), painting (12%) and polishing (15%) (Choge 2002). Sanding is thus a critical stage that requires considerable concentration and greatly influences the price of the finished product. In certain cases, for example, when carvers are carving individually outside any groups or co-operatives, all the carving stages are undertaken by one person. However, products made by individuals are often sold in a less finished state, mostly to more established groups or dealers.

## TRADE AND MARKETING

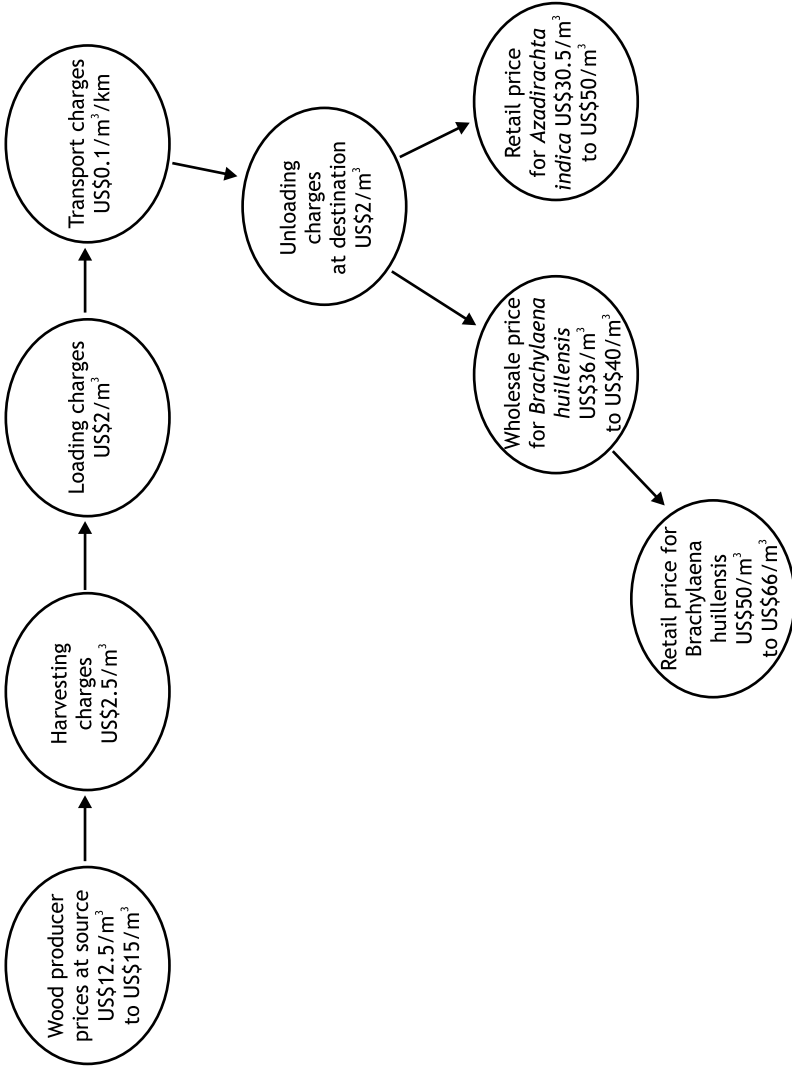
Middlemen or agents dominate the supply of wood to the carvers. The agents, most of whom are members of the resident Mijikenda, often scout for wood among local farmers ready to dispose of mature *Azadirachta indica* or other carving trees within their farmlands or liaise with wood poachers to deliver the highly priced *Brachylaena huillensis* from state forest of Arabuko Sokoke. Prices at source were observed to range from US\$12.5/m<sup>3</sup> to US\$37.3/m<sup>3</sup> depending on the species and sizes available, the bargaining power of the resource owner and a range of other factors (Figure 2). *Brachylaena huillensis* and *Azadirachta indica*, for example, cost about US\$12.5/m<sup>3</sup> and are always negotiable. Harvesting charges were estimated at US\$2.5/m<sup>3</sup>, loading charges at US\$2/m<sup>3</sup>, transport charges at US\$0.1/km/m<sup>3</sup> and unloading charges at destination at US\$2/m<sup>3</sup> for all the species. At the destination, agents dispose the consignments at wholesale (US\$36/m<sup>3</sup>) or retail prices (US\$66/m<sup>3</sup> for *Brachylaena huillensis* wood). Usually there is no wholesale trading of *Azadirachta indica*, with retail prices ranging from US\$30.5/m<sup>3</sup> to US\$50/m<sup>3</sup> (Figure 2).

Carving adds a high value to the wood. For example when medium sized articles<sup>9</sup> are made, an estimated 600 articles are produced per unit volume (1 m<sup>3</sup> of solid wood), selling as low as US\$1 per article (or US\$600/m<sup>3</sup>) in a domestic market to as much as US\$5.6 per article (or US\$3,600/m<sup>3</sup>) or higher in tourists markets.

## POLICY ENVIRONMENT

Despite its economic importance, the woodcarving industry in Kenya has not received the same government attention as the larger commercial logging industry. The woodcarving industry is built on a rapidly declining resource base whose control and management, directly or indirectly, largely falls within the state mandate. A recent study (Choge 2002) identified easy access to carving wood from state forests (due to poor management) as one of the main causes of the observed unsustainable utilisation of these prime carving species in Kenya. This situation has contributed immensely to the failure of wood market mechanisms to operate efficiently. As other studies have shown (Repetto 1987; Repetto and Gillis 1988), it acts as a powerful incentive for resource mining if government leaves all the profits of a resource harvest to exploiters without seeking appropriate returns. This is the exact situation regarding the woodcarving industry in Kenya today.

Figure 2. Carving wood prices and other charges for *Brachylaena huillensis* and *Azadirachta indica* along the marketing chain in Kenya



Forest and tree resource exploitation in Kenya is subject to various state laws and policies, including Presidential Decrees and directives that have a direct impact on conservation, utilisation, alteration or removal of forests. Although the regulations are fairly comprehensive, they are spread over various acts which are administered without co-ordination by a wide range of authorised public bodies and individuals, some of whom are even unaware of their responsibilities (MENR 1994). Lack of political will in support of the forest sector in Kenya further complicates the problem where sanctioned forest excisions are rife and where effective deterrents against economic activities that degrade forest resources are lacking. The present exploitation pattern maximises short term private benefits at the expense of long term sustainable utilisation and conservation values. If the policies and laws relevant to the woodcarving industry were administered more efficiently, potential benefits would ensue as listed in Table 1.

Generally, the scattered and poorly harmonised legislation governing utilisation of tree resources in Kenya is being addressed under the Forest Policy and Law. The bill seeks to establish a legal body responsible for environmental conservation, to co-ordinate environmental management between different sectors and to set binding standards and liabilities against environmental damage (Emerton *et al.* 1998). More importantly, the introduction of stakeholder involvement in decision making, planning and management of existing forest resources, including the local communities and perhaps a supportive political will to implement these changes, is likely to impart positively on the woodcarving industry in Kenya.

## TRENDS AND ISSUES

The wood industry in Kenya is characterised by overexploitation of the favoured tree species from one area to the next, and carvers have to constantly shift to new areas with sufficient raw materials. As the most intensively utilised species, *Brachylaena huillensis* has been most negatively impacted. Its scarcity has also led to importation of *Brachylaena* logs from Tanzania. For example, between 1988 and 2000 34% of the wood used in Kenya was represented by *Brachylaena* logs smuggled from Tanzania. While alternative species have increasingly been used by carvers, the question remains whether these new woods can support the growing industry. Wood scarcity is affecting not only the woodcarving industry but furniture and other industries as well. This underlines the need for diversification of wood types used in the carving industry and on-farm cultivation of fast growing trees for supply to the woodcarving industry. The switch to alternative carving species and the use of juveniles or wood of unknown carving qualities have introduced a number of challenges, most of them revolving around cracking of finished carvings. This has resulted in enormous wood waste, loss of income and loss in market share. The effects of scarcity the carving wood scarcity in Kenya are shown in Figure 3. Presently there is a general acute imbalance in carving wood supply and demand in the country, manifested through higher prices of wood, longer distances covered by carvers in search of wood, more use of immature wood and a wide range of other varied responses. This shortage has led to increased incidences of

**Table 1.** Chronology of major forestry legislation and its potential impact on the woodcarving industry in Kenya

Year	Legislation	Potential impact on woodcarving industry
1957	First forest policy drafted	Provides for government involvement in all commercial wood sectors.
1962	Forest Act, Cap 385	Enforced by the Minister for Environment and Natural Resources, it addresses reservation, protection, management, enforcement and utilization of forest resources on government lands by mechanisms such as organized licensing, setting of royalty rates and sale of <i>Brachylaena</i> and other hardwoods within natural forests.
1962	Trust Land Act, Cap 288	Enforced by the Minister for Local Government, it controls unauthorized occupation and utilization of trees on land not covered by Forest Act; allows controlled use of <i>Dalbergia</i> , <i>Combretum</i> and others on trust land.
1968	National Forest Policy (first session paper)	Formulated 10 principles for forest management for the greatest common good and on sustained yield basis. Annual extraction quantities for <i>Brachylaena</i> and other species in state forests could easily have been worked out. Extraction now is based on impression of local officers.
1970	Revision of the Trust Land Act, Cap 288	Requires authorization of District Commissioner or other persons designated by the Local or Urban Councils to grant licenses for extraction of natural resources on trust lands. Has been greatly abused, leading to uncontrolled poaching of prime species on trust lands in many areas.
1970	Chief's Authority Act, Cap 128	Controls use of tree resources on private land and prohibits destruction of vegetation and wasteful use of trees and other products. Low penalties for violations resulted in widespread depletion of <i>Dalbergia</i> and other major species on private lands.
1976	The Wildlife Act, Cap 376	Conservation of forests within National Parks, Games Reserves and Sanctuaries and other forest areas is covered under the memorandum of understanding between Forest Department and Kenya Wildlife Service.
1980	The Agriculture Act, Cap 318	Implemented by Provincial and District Agricultural Committees and Boards, it is meant to prevent destruction of natural vegetation on private land and loss of habitat of important species through bush and tree clearing, but is rarely put into practice.
1981	National Food Policy (fourth session paper)	Underlines the role of forests and trees in climate stabilization and other ecological significance. While sections of the law restrict tree cutting and encourage conservation, the government often goes against this purpose through sanctioning of forest excisions to settle people on the same land meant for conservation.
1986	Presidential ban on logging of indigenous timber	Completely bans felling of indigenous trees in Kenya with little or no alternatives, triggering a ripple effect of depletion of resources because of artificial resource shortages. No legislation exists to back its implementation.
1990	The wildlife policy	The policy specifies non-consumptive use of forest resources through benefit sharing of revenue for recreation between the government and local communities. Implementation of the policy in late 1990s has led to decreased extraction of <i>Brachylaena</i> from Arabuko Sokoke forest.
1994	Revised Forest Policy	Addresses new concerns and realities by envisaging greater involvement of local communities and other stakeholders in management decisions of forest and natural resources, benefit sharing, private investments in tree growing, non-consumptive use of forests, etc.



adulterated carvings, cracking and making of smaller sized products among other workarounds (Figure 3). These effects need to be urgently addressed in the interest of conservation and to provide an assurance for the livelihoods of carvers and their families.

The growth of the industry in terms of new entrants has resulted in many management problems within the existing groups and co-operatives, already riddled with poor management, incompetence and corruption. The existence of many independent carving groups, co-operatives and individuals all competing for a place in the same carvings market has created a fertile ground for destructive competition for marketing of carvings so that products are generally priced below the realistic market price, which ideally should reflect the prevailing situation of wood scarcity. Low product prices result in low incomes and enhance the chances of resource mining as carvers make many more products to meet basic family expenses and other obligations.

A recent study (Choge 2002) has shown that a carver who is a member of the co-operative system in Kenya is able to make at least 200 complete medium sized articles per month and trade about 50 of them, earning a net income of at least US\$1,125 per month for sales made through the co-operative (Table 2). The rest of the articles (150, or 75%) may remain unsold for several months or even years, hence tying up capital for considerable periods. However, most of the carvers prefer to sell surplus goods to middlemen and other dealers outside of the co-operatives (who offer instant cash), usually for a fraction of the actual price (as low as US\$1 to US\$1.5 instead of the co-operative price of US\$5.6 per product), for an additional US\$150 per month if they are lucky.

**Table 2.** Marketing scenario of carvings under the existing co-operative management system in Kenya

Approximate number of products made per month	200 medium sized carvings
Value of products (US\$)	1,125
Cost of production (US\$)	250
Less taxes (15%) (US\$)	743.8
Less marketing charges (10%) (US\$)	669.4
Less other overheads (10%) (US\$)	602.4
Value of sales made (25%) (US\$)	150.6
Tied up capital (75%) (US\$)	451.8

Generally, the government has not been directly involved in the woodcarving industry, particularly regarding policy instruments on regulation of wood supply, marketing of products, formation of co-operatives and other incentives towards sustaining the industry—areas that obviously lie within its mandate.

## UNDERLYING ISSUES

The accelerating decline of the world's forests is viewed as one of the greatest threats to conservation of biodiversity (Myers 1996). Already there is growing

shortage of specialised hardwoods from the tropics as a result of overharvesting (Sharman 1992; Barbier and Burgess 1994), imposing severe economic consequences on sectors that depend on these hardwoods. Woodcarving, now commonplace in many countries in Africa, is experiencing a loss of self-sufficiency in favoured wood species (Cunningham and Choge in press).

The woodcarving industry in Kenya has received some national and international attention in recent years when a number of studies under the People and Plants Initiative addressed concerns about lack of sustainability. Some of the key recommendations from these initiatives regarding woodcarving follow.

### **Supply dynamics of carving wood**

- Inventories of available stocks of hardwoods and alternative species are needed for all the existing sources as a guide to planning, consumption projection, determination of off-take volumes and other aspects related to policy formulation on utilisation.
- A temporary ban on extraction of prime carving hardwoods from more affected natural forests is required until stocks recover.
- Use of alternative woods needs to be encouraged and aggressively promoted as a buffer against loss of earnings by carvers.
- Alternative woods need to be seasoned to maintain confidence of buyers and market share.
- Private investment in cultivation of fast growing alternative species should be encouraged.

### **Marketing of carving wood**

- Better enforcement of extraction restrictions from natural forests and revision of royalty rates to reflect wood scarcity are needed. Royalty rates should be based on the market price of woodcarving products, not sawn timber. This shift would widen the revenue base and minimise competition for prime carving species by other sectors.
- Woodcarvers, and not agents, should be licensed to extract carving wood to minimise wood price distortion and resource mining and to increase income for carvers.
- Resource owners should consider starting associations to counter exploitation by agents and other wood dealers.
- There needs to be professional management of the woodcarving co-operatives for enhanced transparency in financial dealings with members and aggressive products marketing strategies.

### **Economic returns of carving**

- There is need for improved wood recovery through use of better tools, improved designs of carvings and use of seasoned woods. Training on these aspects is essential.



- Carvers should be encouraged to make fewer products of higher quality and use less wood in the process. Prime wood of high quality should be carved only by qualified carvers to minimise wastage.
- There is need for independent carvers to join co-operatives to eliminate destructive competition in marketing and pricing of products.

### **Policy aspects**

- There is need to harmonise, co-ordinate and enforce more strictly the extraction and utilisation of carving wood from state forests and private farmlands.
- There needs to be a revision of penalties for illegal extraction of wood so as to be more in line with the value of the resources.
- Community involvement in management, decision making and sharing of benefits from forests needs to be addressed.
- Government and donor support is required to sustain the woodcarving industry in Kenya.

### **CONSERVATION AND DEVELOPMENT LESSONS**

The problems of wood scarcity in the woodcarving industry and the apparent lack of concern on the part of the carvers about the source of their material poses considerable conservation and development challenges. Carvers see themselves as detached from the resources and most of them have a culture of working day-to-day without much concern for the future. They still believe that wood will always be available as it has always been, and planning for future resources is a problem for other people. This mindset has been demonstrated through the lack of enthusiasm in tree nursery development and the initial resistance to the use of alternative carving woods. However, through awareness creation coupled with acute shortages of favoured species, these perceptions are gradually beginning to change, but more efforts and resources are needed to educate carvers on these issues.

Useful marketing tools that have been identified as potential incentives for a switch to the use of alternative species are eco-labeling of products made from alternative woods and certification of plantations or forestry systems where these woods are obtained. While these efforts are still in their infancy, it is envisaged that the growing consumer interest in ethical buying of carvings from Kenya will greatly influence the conduct of the woodcarving industry. The use of endangered hardwoods will likely be phased out and alternative woods will take their place.

The problem facing the woodcarving industry in Kenya remained officially unnoticed for many decades and became apparent only in the early 1990s through the efforts of the World Wide Fund for Nature and the United Nations Educational, Scientific and Cultural Organisation through their People and Plants Initiative in collaboration with Kenya Forestry Research Institute, National Museums of Kenya, Mennonite Central Committee (MCC) and Kenya Crafts Cooperative Union (KCCU). Policy issues aimed at making the industry sustainable have since been addressed and some remedies are already being implemented on a pilot basis. These include, for example, the tree nursery

development at woodcarving co-operative premises. The idea behind tree nurseries is to encourage carvers to plant carving trees on their own land for future use or for trading to other carvers. Four tree nurseries are already in operation and supported by the MCC in collaboration with the Micro-Enterprises Support Programme (MESP, under the European Union) and the Ten Thousands Villages Programme. MCC is also working closely with woodcarvers to dry and season the carving wood and products, develop and train carvers to develop new product designs and to be more creative and innovative.

Through the People and Plants Initiative, a pilot certification program for *Azadirachta indica* wood sourced from farmers around Malindi (the study area) is being developed in collaboration with the Forest Stewardship Council and Smart Wood Program of the Rainforest Alliance and Soil Association. Appropriate eco-labels for carvings made from *Azadirachta indica* are also being considered. Generally the impact of these programmes is such that the international markets are learning much about the carving wood types available in Kenya and are increasingly becoming conscious about conservation and hence the need for a switch to buying products from sustainably managed and guaranteed sources.

The issue of resource development and scarcity aside, the heart and breath of a sustainable woodcarving industry in Kenya largely hinges on a centralised form of organisation of carvers in which their interests, and those of the industry generally, are easily met. Well organised associations are likely to take full advantage of the economies of scale in resource acquisition, access to credit facilities, product marketing, standardisation of products and prices, customer contacts and relations, customer confidence and the ease of donor interventions among a wide range of other benefits. The setting up of the KCCU was intended to do exactly that, but it is now overly mismanaged to the extent that it is becoming increasingly irrelevant as carvers opt out to join other groups or work independently. Lack of transparency in dealing with its supportive development partners, donors and other organisations working closely with it has been a great disservice to the carving community in recent years and has caused major problems between them. This should not be allowed to continue.

The greatest dividends of the remaining organised associations are likely to be realised through the improved marketing of carvings. The impact of poor marketing under the current management scenario within the existing co-operatives was demonstrated as shown in Table 2, with 75% of the products remaining unsold<sup>7</sup>.

These findings show that there is everything to be gained by remaining organised and everything to be lost by encouraging destructive competition. Owing to the current problems facing the co-operatives and the union, the carving community and their leaders need to go back to the drawing board, do some soul searching and formulate lasting solutions for their unity of purpose in response to the changing trends in global economic climate, environmental order and consumer behaviour and demands. In the interim, the bottom line is that education of carvers about the country's rapidly disappearing forests is crucial, and more importantly, their individual and collective contribution towards developing a sustainable industry to complement the efforts already in place which exist for only one reason—to protect their interests and those of their dependants.

## ACKNOWLEDGEMENTS

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## ENDNOTES

1. Kenya Forestry Research Institute, P.O Box 20412 Nairobi, Kenya. E-mail: kefri@arcc.or.ke
2. Exchange rate US\$1 = Ksh80.
3. Export data for Kenyan carvings show that the main destinations are USA (47%), Japan (10%), Spain (7%), South Africa (7%), Germany (6%) and United Kingdom (6%) (Obunga unpublished).
4. *Brachylaena huillensis* and *Azadirachta indica* accounted for 57.4% and 17.2% respectively of all the wood used in the industry in Kenya in the years 1998 to 2000 (Choge 2002).
5. The definite date of introduction of *Azadirachta indica* to Kenya is unknown, but it is widely believed to have been introduced to the country by migrant Indian workers who first settled in Kenyan Coast Province during construction of the Kenya-Uganda Railway in the late nineteenth century.
6. A medium sized article measures about 15 cm to 20 cm in height. Articles this size are the most popular and constitute 70% to 80% of the products made by carvers.
7. Trade statistics and estimates made using wood consumption trends in Malindi and Mombasa carving centres showed that on average 70% of articles produced by members are sold outside of co-operatives.

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## Chapter 10

# Carved wooden drums and trade in Mpigi district, Uganda

*Patrick Omeja<sup>1</sup>, Joseph Obua<sup>2</sup> and Anthony B. Cunningham<sup>3</sup>*

Common names	Part of the resource used	Management	Degree of transformation	Scale of trade	Geographic range
Mutati, Parasol tree, Setaala	Wood	Wild	Medium	International	Medium

### ABSTRACT

In contrast to commercial woodcarving in Fiji, India, Kenya and Vietnam, where hardwood species are favoured, the Ugandan carving industry uses softwood species, primarily trees in the fig family (Moraceae). The major items made are traditional musical instruments such as drums, harps, tube-fiddles and xylophones. These are exported and sold to tourists as well as being sold locally to schools, churches and musical groups, which keep Uganda's vibrant music tradition alive.

This chapter is based on studies undertaken in Mpanga, Degeya and Lufuka forest reserves and the drum making stalls in Mpigi district in central Uganda. A specific focus of the study was the importance of drum making, the impact of drum making on the population structure of species used, their regeneration rates and the current demand for the wood of these species.

It was found that the reliance on woodcarving in Mpigi district is significant. Drums in particular had great significance in alerting people to meetings, weddings, funerals, dancing competitions, and as gifts during give-away ceremonies. Despite all the potential benefits, carvers do not have associations through which to act quickly and effectively at the national level. The results also showed that the intensity of use and concentration on only a limited number of most favoured tree species have led to overexploitation. To guarantee future supply of wood, a move to on-farm production of the desired species such as *Polyscias fulva* is recommended.

## INTRODUCTION

The wood carving industry in Uganda produces mainly musical instruments while other carvings such as animals are imported from neighbouring Kenya. Unlike in many African countries, where the use of traditional instruments has given way to electronic sound and Western type musical instruments, most areas in Uganda still have a rich cultural instrument tradition. In central Uganda, wood carving is one of the important economic activities offering full time employment to over 250 households in Mpigi district alone (Samula 2001). Although it is a means of making a living, it is also a way of keeping culture and indigenous knowledge alive. Wood carvers in central Uganda make musical instruments such as short and long drums, bow harps and xylophones. This chapter presents the findings of a study on the short and long drums, the predominantly carved instruments in the area. The centre for making and marketing of carved wooden drums is Mpigi district in central Uganda, especially around Mpigi town. The stalls dotted along the Kampala-Masaka highway and in Kampala city are basically sale outlets for drums.

The wood used for making these instruments is obtained from natural forests, which have been harvested for a long time (Hamilton 1984; Taylor *et al.* 1996). While subsistence production rarely has negative ecological or social impacts, the same is not true of commercial trade in these wooden drum carvings made from favoured tree species which in most cases take over 10 years to reach mature and harvestable sizes of 20 cm diameter at breast height.

Commercial production of wooden drums in this area, where there are few other economic opportunities, has become an important means through which poorer rural people enter the cash economy (Samula 2001). Increase in the drum making business in Mpigi district has raised concern about the population structure and supplies of the tree species being used, the socio-economic impacts and the ecology of the natural forests where they occur and are exploited. As a result, two studies were undertaken between August 1998 and January 2000 to determine the population structure of the tree species used, their distribution, regeneration rates and the current demand and supply.

## DESCRIPTION OF THE STUDY AREA

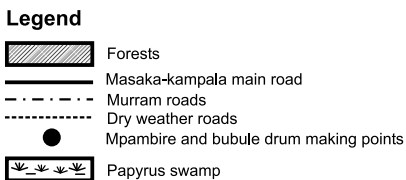
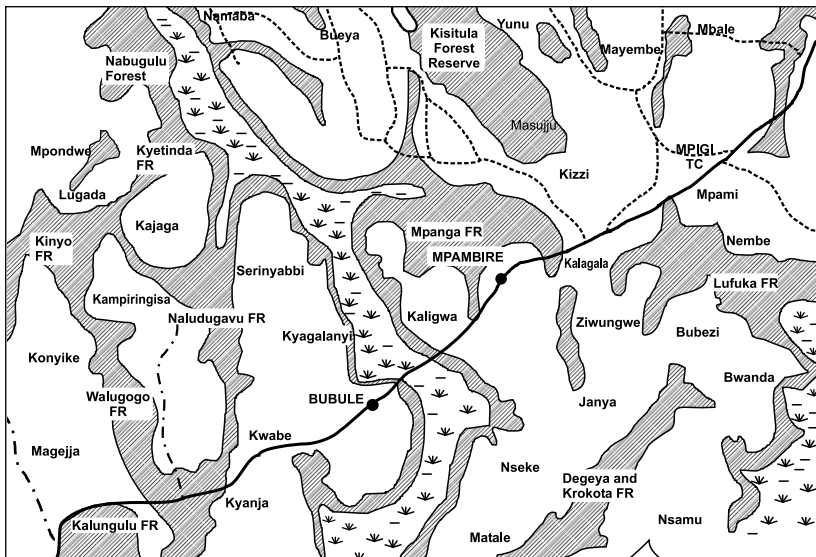
### Location and physiognomy

Mpigi district is located between latitudes 00° 00' and 00° 30' N and longitudes 31° 45' and 32° 31' E (Figure 1). The altitude range is 1,150 m to 1,270 m above sea level. The area occupies the lower slopes and floor of Nabukongole valley, which has a permanent stream that drains southwards into Lake Victoria (Howard 1991). The underlying rocks are of Pre-Cambrian origin belonging to the Karagwe-Ankolean system and consisting of granitoid gneisses and schists (Lingdale-Brown 1960).

### Climate

Mpigi district lies outside the influence of early morning storms but receives afternoon rainfall. The rainfall has bimodal distribution, that is, March to May

Figure 1. Map of the case study area



Sources: ESRI Data and Maps 2002 and Samula Aisa and Omeja A. Patrick 2003.

and September to November, with a principal peak in April and a minor peak in November. The annual rainfall is 889 mm to 1,676 mm. Minimum temperature ranges from 11.7°C to 16.1°C, maximum from 26.1°C to 33.3°C (Howard 1991; NEMA 1997).

## Vegetation and fauna

The forests in Mpigi district may be broadly classified as medium altitude moist evergreen *Piptadeniastrum-Uapaca* forest and medium forest/savannah mosaic. The flora of these reserves is not especially diverse and relatively few rare or restricted range species are present (Howard *et al.* 1996). The forests have close affinities with certain Congo and west African forest types in general appearance and structure, and practically all genera found in these areas are also found in the west. The vegetation is composed of medium altitude moist evergreen forest to high altitude forest (Hamilton 1984), *Celtis*, *Morus*, *Aningeria* and *Bosqueia* being the common tree species. According to Howard (1991), 345 plant species (28% of Uganda's total) have been recorded in this area. The forests also have a diverse mammalian and avian fauna such as black-billed turaco (*Tauraco schuetta*), black and white casqued hornbill (*Bycanistes subcylindricus*), red tail monkeys (*Cercopithecus ascanius*), and black and white Colobus monkeys (*Colobus guereza*).

## Study forests

Three forest types having different management histories were selected for this study. One is Lufuka forest, located 1 km south-east of Mpanga forest. It has experienced high human activity by the immediate local community and people elsewhere. Activities like extraction of logs for drum making, charcoal burning, pit sawing with no or little restriction coupled with its location near the main road has made the forest highly degraded. The second, Degeya forest, is located 4 km south of Mpanga forest reserve. Long distance from the drum making community and vigilant forest law enforcement by forest guards and local leaders have left this forest relatively less disturbed. The third area, Mpanga forest reserve, has been minimally disturbed because of conservation concerns and therefore was designated as a research forest by the Forest Department in 1951.

## GENERAL METHODS

### Study design

Socio-economic and forest inventory methods were used to collect data. During the social survey a range of interest groups involved in drum making were interviewed using structured and unstructured questionnaires to collect information on the sources of wood used for making drums, the tree species used and those preferred, their availability (supply), distribution and fluctuation in abundance. The forests were surveyed to collect data on population structure, diameter at breast height and distribution of tree species that were



highly demanded by the drum makers. Demand for carved wooden drum frames by drum makers was assessed using data from Samula (2001). Survey data from the major drum producing area of Mpambire village were used. Demand was assessed by examining the weekly volume of wood required by each drum making stall and the total number of such stalls in the Mpambire area.

## RESULTS AND DISCUSSIONS

### Drum making history and trade

Oral accounts by Kibira, Kawuma and *mzee*<sup>4</sup> Gayira indicated that drum making is a specialised branch of woodworking that also requires knowledge of leather working. The drum making industry in central Uganda, according to them, evolved out of the carving traditions of Baganda people from Masaka district. These people migrated to central Uganda in search of land and settled in Mpambire, 40 km west of Kampala. They started making drums for the *kabaka* (traditional king), *abakungu* (resident district commissioners) and the *abatongole* (local councillors).

Trade in drums, however, began internally within villages in Mpigi, where heads of families bought drums as symbols of leadership and also used them for informing people about important events and local meetings. As this business was promising, in the early 1970s some stalls were established along the Kampala-Masaka highway in Mpambire to meet demands from Asians living in Kampala. By the mid-1970s the roadside businesses had attracted Akamba businessmen from Kenya, and this marked the onset of drum trade at a regional scale. The Akamba travelled on foot to central Uganda, gathered a number of musical instruments and returned to Kenya.

**Photo 1.** Short drums of various sizes (Photo by P. Omeja)



**Photo 2.** Tables with musical instruments in the background (Photo P. Omeja)



In the late 1970s, the Ugandan government got involved in this business and opened the Uganda Craft Shop (now The Grand Imperial Hotel). Government interest arose because of the good foreign market at that time and the increased tourism influx. This boom, however, did not last long because of the general collapse of the Ugandan economy following the military coup in 1971 and the expulsion of Asians in 1972. But these events did not mark the end of the drum industry because the Akamba remained active in the drum trade up to 1979. Since the early 1990s, the industry has expanded, most of the products being bought by tourists. Political stability and economic recovery since 1986 and growth in the tourism industry have helped to sustain the drum trade in Uganda.

### **Benefits from the drum making industry**

The most important impact of drum making has been its ability to generate gainful employment for over 300 people, especially remote area dwellers and those with little or no formal education. Between September 1999 and October 2000 drum sales from this area alone amounted to US\$11,000. Drum making is an important income earning opportunity for local people, especially since agricultural productivity was low in the last decade because of coffee wilt disease and banana weevil attack and there are few income generating options available to them.

The second important benefit to producers is of social and psychological nature. The creative and flexible nature of drum making bestows a variety of personal benefits including a sense of identity, self-reliance, self-awareness, empowerment, confidence, respect and cultural self-esteem. Drum making has elevated the social status of individual producer households. For example, two old men, *mzee* Gayira and *mzee* Miiro, are known in the area as the first people to develop drum making culture and trade in Mpumudde area. Various individual attributes have also been enhanced including entrepreneurship, initiative, leadership, risk-taking and management skills.

Drum making has also provided gainful employment to local people, hence contributing to social stability. In particular it has helped to reduce rural exodus and associated social problems, which in turn has reinforced family cohesion and stability.

In addition, drum making has helped strengthen the cultural traditions for both individuals and society. Drum makers in Mpigi supply drums to the National Theatre in Kampala. Primary and postprimary schools participating in national cultural festivals buy the drums. As a result drum making offers an opportunity for cultural self-examination and awareness and preserves local culture. The cultural aspect of the drums inherently helps the government in its policy to make culture accessible as 'living and evolving tradition'. Through drums the promotion of cultural activities and collection and distribution of cultural information adds to positive cultural identity, enhances national identity, national building and international co-operation.

### The resource base

Drum making is based on extraction and processing of stems of softwood species since timber harvesters have depleted the desired hardwoods in the 1980s, when there was a breakdown in law and order. Utilisation of softwoods implies that there are few competing uses for the resource. Although many species can be carved into drums, wood qualities of a relatively small range of species have favoured only a few species over others (Table 1). In the past, special types of drums for the *kabaka* were made exclusively from *muvule* (*Milicia excelsa*) trees (Lush 1935), while other drums were, and still are, made from other suitable timbers depending on the size of drum and the quality of the wood.

**Table 1.** Tree species used in the drum making industry

Scientific name	Local or Luganda name	Family
<i>Alstonia boonei</i>	<i>Musoga</i>	Apocynaceae
<i>Antiaris toxicaria</i>	<i>Kirundu</i>	Moraceae
<i>Bosquiea phoberos</i> ( <i>Trilepsium madagascariensis</i> )	<i>Mugwii</i>	Moraceae
<i>Canarium schweinfurthii</i> *	<i>Muwawu</i>	Burseraceae
<i>Cordia africana</i> *	<i>Mukebu</i>	Boraginaceae
<i>Cordia millenii</i> *	<i>Mukebu</i>	Boraginaceae
<i>Erythrina excelsa</i>	<i>Bajangabo</i>	Leguminosae
<i>Ficus exasperata</i>	<i>Luwawu</i>	Moraceae
<i>Ficus natalensis</i>	<i>Mutuba</i>	Moraceae
<i>Ficus mucoso</i>	<i>Kabalira</i>	Moraceae
<i>Ficus sur</i>	<i>Kabalira</i>	Moraceae
<i>Ficus sycomorosa</i>	<i>Mukunyu</i>	Moraceae
<i>Funtumia africana</i>	<i>Nkago</i>	Apocynaceae
<i>Maesopsis eminii</i> *	<i>Musizi</i>	Rhamnaceae
<i>Milicia excelsa</i> *	<i>Muvule</i>	Moraceae
<i>Morus mesozygia</i> *	<i>Mukoge</i>	Moraceae
<i>Musanga cecropioides</i>	<i>Namaguro</i>	Moraceae
<i>Polycias fulva</i>	<i>Setala</i>	Araliaceae

\* Reserved species occurring in some parts as pure stands.

Source: Samula 2001.

Generally the wood must be:

- easily workable, i.e., easy to hollow out and carve into a desired drum shape without damage;
- light in weight because drums are portable instruments;
- easy to sun dry without warping and cracking;
- of straight, unblemished boles free of branches;
- available in the vicinity; and
- resistant to insect and pest attack (especially wood borers).

It was found that harvesting of trees for drum making in two of the study forests, viz., Lufuka and Degeya, was not sustainable. The volume of round wood used by drum makers in 1999 was 1,113.76 m<sup>3</sup>, whereas the calculated combined annual allowable cut volume was 502.9 m<sup>3</sup>. These figures imply an excess demand of 610.8 m<sup>3</sup> of wood for drum making. The excess demand against a low annual allowable cut coupled with a history of heavy exploitation and poor recruitment pattern clearly do not make drum making a viable enterprise for meeting the market demand in the medium to long term unless on-farm tree planting of the desired species is promoted to supply the wood.

Trees were already being harvested from the edges of Mpanga forest reserve. If this trend continues, the conservation of Mpanga forest, which is being facilitated by development of ecotourism, may be jeopardised because of the adverse impacts of tree harvesting on bird and primate populations that are potential ecotourist attractions.

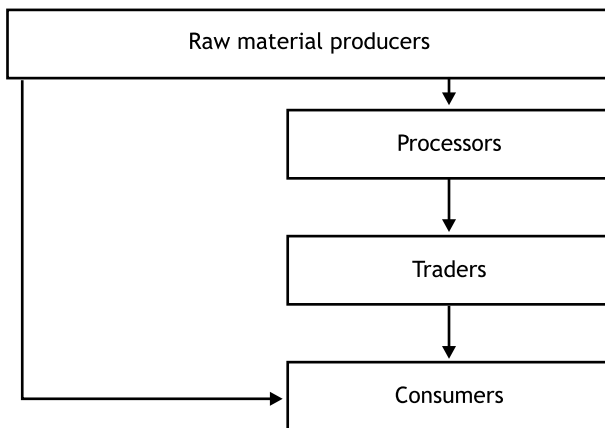
### **Production, trade and marketing**

Drum production in Mpigi district started as early as the nineteenth century, although trade increased to current levels about 30 years ago (Samula 2001). Carvers market their products by the roadside, where they are displayed or sold in bulk to outlets in the city centre and then sold to tourists and other buyers. Unlike farmers and other traders who market products through a co-operative movement, drum makers and traders do not have such a body. The small size of the industry and lack of a market information system have constrained the growth of the drum making industry, which can be described as 'stall', 'home based' or 'roadside' trade. Moreover, it is difficult to draw a clear line between drum makers (producers) and drum traders because the business is holistic in nature. The production-marketing chain is therefore summarised in Figure 2.

### **Policy issues, support and interventions in drum making industry**

There is no policy on production and marketing of wooden drums in Uganda. Any policy aimed at promoting woodcarving in Uganda would depend on the interrelation between production and marketing. As such, there is a need for both supply and demand oriented policies and strategies. There is also a need to guide the interrelationships among culture, crafts, tourism, handicrafts and natural resources used in the woodcarving industry. Where possible, policies, plans and programs should be formulated to address the needs of specific crafts subsectors and geographic areas.

**Figure 2.** Diagrammatic representation of the production-marketing chain for wooden drums



It is clear from Uganda's national planning document Vision 2025 that environmental conservation and management are crucial for sociocultural and economic development and national prosperity. To achieve these goals there have been significant policy changes in the management of natural forests and biodiversity conservation such as the development of the National Forest Plan and the National Biodiversity Conservation Strategy. These are important provisions in the National Environment Statute No. 5 of 1995 and the Forest Policy. The National Environment Statute contains guidelines to promote sustainable forest resource use and environment management and assigns roles to various agencies in this regard.

In the case of the drum making industry the relevant statute is the Forest Act of 1964, included in the 2002 Forest Policy for Uganda after a global shift in management goals of natural resources (IUCN 1986; NEMA 1994). It therefore incorporates the needs of human populations living adjacent to forest reserves while at the same time protecting the biodiversity and integrity of physical and ecological processes of reserves. Successful implementation of this policy would serve as viable measures for conservation of natural forests and biodiversity that form the base for wooden drum makers.

According to the Uganda Forest Policy of 2002, drum making and use is still recognised as a subsistence activity because carved wooden drums have been used in the Buganda Kingdom palaces for a long time and the history of their use dates back as far as the eighteenth century (Lush 1935). The long history of drum use in the whole of Uganda also explains why a drum is part of the Uganda national coat of arms (Figure 3), which depicts the cultural significance attached to it. But the situation has changed over the years and drums are now significant commodities in both the local and tourist markets.

It is illegal for drum makers to cut trees from forests for making drum frames because they do not have permits or licenses, but once the drum frames are transported to the drum making stalls by the roadside they become legal items. This situation implies that, despite the adoption of new policies,

**Figure 3.** The Republic of Uganda's coat of arms includes a drum



the government still fails to offer any direct investment or incentives for development of raw material production. The wood harvesters are aware that their activities are carried out illegally.

Forest Department records of 1998 to 2000 showed that a running volume of softwood species (under which the drum making tree species fall) is valued at US\$20/m<sup>3</sup> (on average a whole tree stem). This volume yields on average 10 drums of 30 cm to 45 cm top diameter, which earns US\$200 to US\$300, and another 10 drums of 10 cm to 15 cm top diameter, which bring an additional income of US\$100 to US\$150. This calculation excludes smaller drums of less than 10 cm top diameter obtained from tree branches. Despite these financial benefits there is no clear policy to regulate drum making, something that should have been spelt out clearly in the Forest Policy.

The collaborative forest management unit of the Forest Department and the Mpanga Forest Ecotourism Project offered the opportunity for involving the local community in forest management while generating revenue from the forest. Owing to financial constraints and inadequate staff, the Forest Department has failed to implement collaborative forest management successfully in Mpanga and the unit was disbanded. Continued tree harvesting in Mpanga forest reserve for drum making therefore is a disincentive to tree planting to provide wood for making drum frames. Plantation of the favoured tree species on the other hand would act as a source of income from sustainable sources. In the long run this would alleviate the abject poverty of the communities in Mpigi district by guaranteeing an income from the already well-established markets. Successful collaboration among drum makers, local community and Forest Department would be a sound basis for achieving the goals of forest conservation and sustainable use of forest resources in Mpigi district.

## **CONSERVATION, DEVELOPMENT IMPLICATIONS AND RECOMMENDATIONS**

This study has shown that there is a combination of diminishing raw material supply, increased demand of finished product and almost complete policy neglect of wood carving in Uganda. Existing policy emphasises that a balance be created between using the environment for economic development and conserving it for future generations. Lacking other information one can only assume that this is the policy to follow. However, at the moment these two factors, viz. economic development and conservation, are largely pulling in different directions. Drum makers are trying to maximise use values without looking at sustainability, while forest resource managers are concentrating on conservation without fulfilling the policy that forest resources should be used for sustainable economic development.

It has also become clear from a narrow economic viewpoint that providing assistance to preserve and encourage the drum making industry may be unsound. However, from a broader economic perspective that includes cultural values, cultural preservation is desirable and subsidies that help promote carved wooden drums would be perfectly legitimate. In addition, it shows that some of the changes taking place are tending to limit the ability of the poor to exploit the opportunities available from drum making activity. Carvers possess the skills and technology to benefit from the opportunities presented by the market, but depend mainly on traders and other intermediaries for access to export markets. Thus the benefits and sometimes control end up in the hands of outsiders.

In this case, a more extensive campaign is needed to ensure that drum makers are fully aware of their responsibilities related to resource use and the effects of improper and proper utilisation. More opportunity is needed for drum makers to discuss and make decisions on issues concerning their own livelihoods. Drum makers and other resource users should be mobilised and helped to form the appropriate bodies (e.g., community institutions) to manage the craft sector's natural resources pro-actively. Craft development organisations and interested and capable marketing enterprises should be assisted to work alongside the drum makers in forest management.

The government of Uganda should look into ways of reducing the cost of producing and marketing carved wooden drums. This most crucial aspect can be addressed through support and subsidy measures. Since the drum making industry is economically viable, subsidies are justifiable to ensure that financial incentives continue to exist for producers and marketers. By subsidising certain aspects of the drum making industry, greater proportions of income remain in the hands of producers, their families and communities. In this way, more benefits accrue to the local people. Areas that can be most easily subsidised include transport (product collection and purchasing, and raw material collection and marketing), design and skill upgrading and various other marketing costs such as production of informational and promotional materials. Reduction of transport costs should be considered because certain high quality drums made in rural areas lose their comparative advantages because of the high cost of transportation to the market.

There is also a need for improving the quality of existing drums and make them sellable in a competitive market. Qualities such as a good array of woven skin strings must be evident to the buyer if the drums are to sell well. Although some of the drums in the market already have this advantage, the quality of other products needs to be raised to command higher prices.

Just as the need for support and subsidisation would generate a greater share of the profit to producers, the policy related to quality improvements should lead to increased income levels, because producers can receive more money for the same amount of work. For example, it takes an equal volume of wood to make a high quality drum as a poor one, but the high quality drum can fetch more than five times the price.

In view of the above, another policy area should address stabilisation and expanding the market by encouraging drum production and market access for expatriates, residents, local upper-class buyers, tourists and export. To safeguard a stable demand, financial and technical support is needed to undertake market research and develop a market information system. This is not something that producers can be expected to know; nor do they have the income to undertake such an effort. The market needs to be continually assessed, feedback provided to drum makers and the quality of carved wooden drums developed and refined accordingly.

The way forward presented above and the associated strategies need to be implemented effectively in order to improve the drum making industry. Greater benefits to those involved, specifically improvements in the present income levels, should be realised so that the drum making industry in Uganda can generate income commensurate with the level of quality and effort invested. In so doing, those involved in the industry could obtain the benefits they deserve.

## ACKNOWLEDGEMENTS

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## ENDNOTES

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4. *Mzee* denotes an elder in Luganda language.



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## Chapter 11

# Trading forest products in South-Eastern Zimbabwe: ecology, economics and politics of woodcarving

*Wavell Standa-Gunda<sup>1</sup> and Oliver Braedt<sup>2</sup>*

Common names	Part of the resource used	Management	Degree of transformation	Scale of trade	Geographic range
Afzelia, Pod mahogany, Mukamba	Wood	Wild	Medium	International	Large

### ABSTRACT

The commercial use of natural resources to manufacture products for sale to tourists has become a significant supplementary source of income to rural people in all areas of Zimbabwe. The use of natural resources to produce woodcarvings has been controversial because of the volume of wood used and the impact on woodlands. This article explores some of the baseline data, which have been gathered under an economic study of the woodcarving industry along the Masvingo-Beitbridge road. Results of the analysis show that returns to time invested in carving are higher than from other locally available alternatives. The growth of the industry is primarily attributed to (a) the drought years, which forced people to seek alternative livelihood options; (b) the economic structural adjustment programme that devalued the Zimbabwean dollar thereby attracting more foreign visitors while at the same time resulting in loss of jobs especially in the public sector as well as a lowering of real wages across all sectors as subsidies were removed; (c) the collapse of apartheid in South Africa and the several years of domestic political stability in Zimbabwe, which led to a significant increase in tourist traffic between the two countries. The implications of the results are considered with respect to the sustainability of this growing sector.

### INTRODUCTION

In the past, non-timber forest products (NTFP) were largely used to meet household requirements. However with changing socio-economic situations,

many individuals have started selling some of these products (Arnold *et al.* 1994; Browder 1992). In Zimbabwe, it is now a common feature along major roads passing through rural areas to see people selling a diverse range of forest products. These products include carvings from both stone and wood, thatch, baskets, sisal mats, wild fruits, fuel wood, mushrooms, mopane worms, and clay pots (Braedt and Standa-Gunda 2000). The increased commercialisation of these forest products, and in particular wood carvings, has resulted in many questions including:

- How has the increased commercialisation of these products affected rural economies?
- What benefits are there in participating in these markets?
- What has been the response by relevant policy making institutions?
- What has been the sector's impact on the natural resource base?

These questions have not been confined to Zimbabwe, but remain central to research in most countries where the use of forest products by urban and rural households is prominent. As such, diverse views exist on NTFP trade, use and management (Dove 1993; Homma 1992; Momberg *et al.* 1997). There is a growing consensus that woodcarving enterprises are a potential tool for rural development in selected areas. This recognition has led to more institutions putting effort into studying the enterprises with the aim of improving woodland resource use sustainability and traders' returns through better marketing practices. Such efforts in Zimbabwe are exemplified by the work of the Forestry Commission, the Ministry of Employment Creation and National Affairs and the University of Zimbabwe.



(*Afzelia quanzensis*)

This chapter is a compilation of the work on woodcarvings in south-eastern Zimbabwe, as part of the Center for International Forestry Research's global research on the utilisation of NTFP in developing countries. This case makes use of results from the works of Braedt (2002) and Braedt and Standa-Gunda (2000). The case data have been collected over a period of three years (1996-1998) through market, ecological, and household surveys in southern Zimbabwe.

## THE STUDY AREA

The study area is centred on the northern portion of the road between the towns of Masvingo and Beitbridge in southern Zimbabwe (Figure 1). This road links South Africa with central Zimbabwe. Between Masvingo and Beitbridge, a distance of 300 km, there are approximately 25-29 craft markets. One overriding feature of these markets is their variability with respect to the size, age, materials used (stone carving, wood carving, clay and needle work products), the types of carvings, the membership of the markets and the seasonality of demand for products (Braedt and Standa-Gunda 2000).

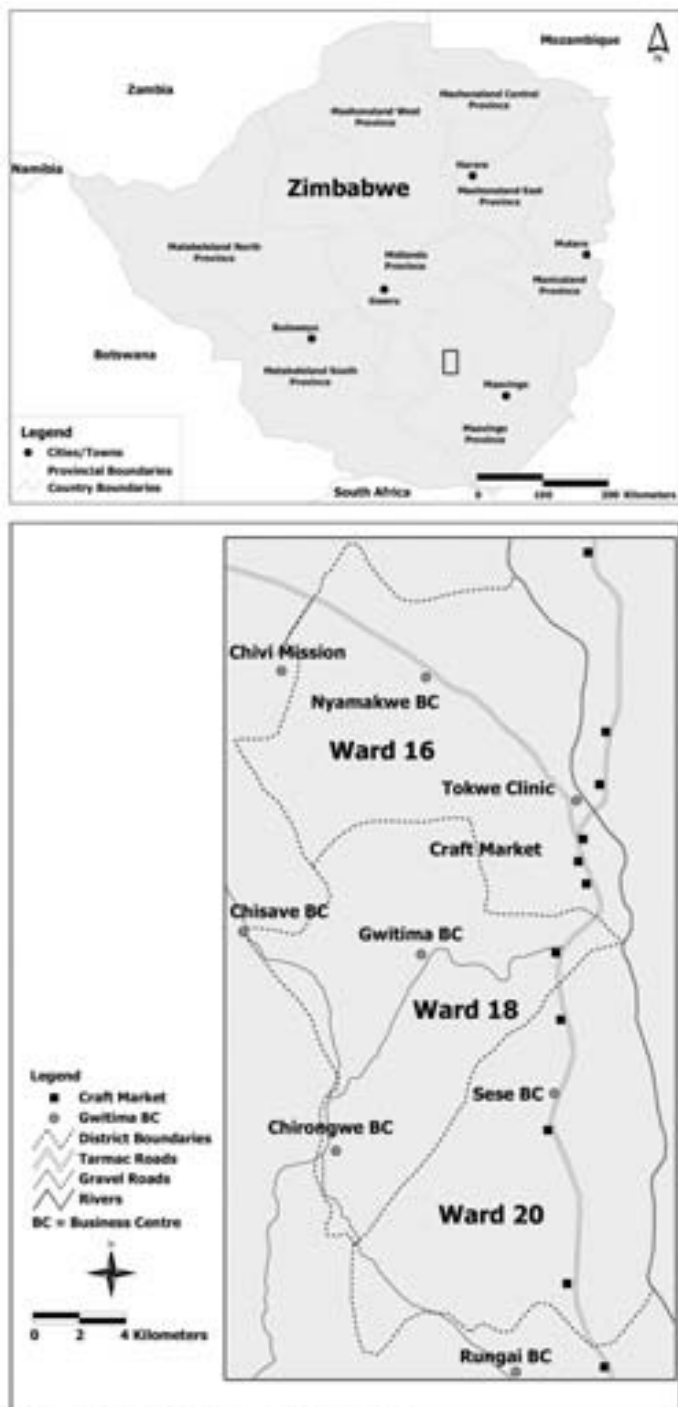
Three of Zimbabwe's four major land tenure systems are found along the road: communal land, resettlement land and commercial/freehold land. Most of the markets are located in Chivi District (69%), which is a predominantly communal area, and in Masvingo District (21%), located mainly on resettlement land. The bulk of the land in the case study area is communal land.

Various factors have probably contributed to the development of the craft sector. Since the late 1980s and the beginning of the 1990s, tourism in Zimbabwe has steadily risen. Zimbabwe's independence in 1980 and the signing of a peace accord between rival political parties in 1987 brought peace to a country engaged in guerrilla activities and civil war since the 1970s. The trend of increasing tourism has probably also been enhanced through the introduction of the Economic Structural Adjustment Program and the resultant devaluation of the Zimbabwe dollar. The purchasing power of tourists using foreign currency was favoured by this development (Braedt and Standa-Gunda 2000). In addition, low quality land, land shortage (Johnston and Kilby 1975; Rukuni 1994) and natural phenomena such as the extreme drought in 1992 left many households, especially the very poor, with few livelihood options. This resulted in the upsurge of off-farm activities such as beer brewing, gold panning, prostitution and woodcarving (Scoones *et al.* 1996).

The population density in the three wards presented in Figure 1 lies at 51 persons per square kilometre. The area falls into agro-ecological Regions IV and V, where rainfall is low (mean annual rainfall is less than 650 mm) and highly variable (coefficients of variation of mean annual rainfall are 35-40%) (Gambiza and Nyama 2001). The soils are largely sandy and of low fertility. The high frequency of droughts and the decreasing availability of off-farm employment have created household livelihood problems for many rural households (Rukuni 1994; Cavendish 1997). Despite the unfavourable conditions, agriculture remains the main economic activity in the area (Figure 2).

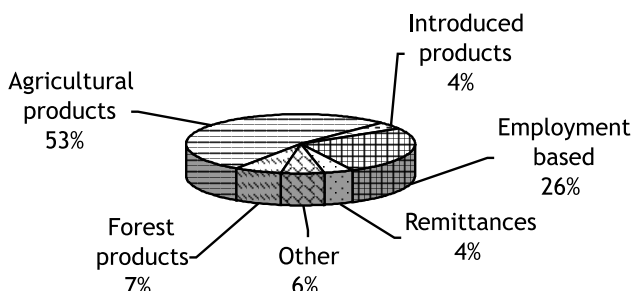
In the communal and resettlement areas woodland resources are generally severely depleted and highly fragmented because of agriculture and settlement. Miombo woodland, where the logs for carving are harvested, is deciduous

Figure 1. Map of the study area



Source: ESRI Data and Maps 2002.

**Figure 2.** Percentages of total household cash incomes for craft sector and non-craft sector participants (n = 139)



Note: Mean annual cash revenue equals Z\$2,776 (95% confidence interval for mean = 2,147 - 3,407) (US\$1 = Z\$11.30). Cash income sources: Forest products = sale of indigenous fruit; sale of firewood; woodcarving; brick making; basketry; pottery; stone carving; gold panning; sale of wild meat; sale of fish; wild fruit beer. Agricultural products = sale of livestock; sale of livestock products; hiring out of livestock; sale of field crops; sale of vegetables; sale of exotic fruits; crop beer; farm work. Introduced products = carpentry; knitting; crochet; sewing; tie and dye. Employment based = formal employment; social welfare; pension. Other = gifts; respondents unwilling to specify source.

Source: Braedt 2002.

woodland dominated by the genera *Brachystegia* and *Julbernardia* (Frost 1996). The abundance of tree species used in the woodcarving sector showed an average 3.9 trees per hectare with a carveable wood volume of 4.6 m<sup>3</sup>/ha (Braedt 2002). The tree species used for woodcarving account for over 25% of the wood volume of all the 78 tree species recorded (total average carveable volume for all tree species = 17.5 m<sup>3</sup>/ha).

Historically, wood was carved for cultural and religious symbols and as household utensils. Now woodcarvings are produced primarily for sale to tourists. Woodcarving production is an important activity throughout the region, e.g. in South Africa (Steenkamp 1999, citing Clark and Magagula 1994), Malawi (Marshall *et al.* 2000), Kenya (Obunga 1995), Namibia (*The Namibian* 1999) and Zimbabwe (Braedt and Standa-Gunda 2000; Matose *et al.* 1997). In southern African countries the sector tends to be unstructured with the bulk of carvings sold at roadside markets.

## CHARACTERISTICS OF THE CRAFT MARKETS

### Location and ownership of raw materials

The major raw materials in the carving business are logs, usually collected from natural woodlands. None of the tree species used for carving is cultivated. Eighty-seven percent of the people in the whole road survey suggested that they harvested and collected logs from communal areas, whilst the remainder said they collected from small-scale commercial farms and resettlement areas. Although it is locally perceived that logs in communal areas and resettlement

areas fall under the collective ownership of the local communities, the underlying legislation for the communal land implies that ownership and use of logs is the prerogative of the local Rural District Councils (RDCs), assisted by the Natural Resources Board (NRB) and Forestry Commission (FC) in overseeing the harvesting patterns. For resettlement land, the resettlement officials, also assisted by the NRB and FC, are responsible. Logs in small-scale commercial farms are 'privately owned', though the NRB and FC are entitled to control their commercial use.

### Available technology and infrastructure

The most important infrastructural feature in the study area is the well maintained network of all-weather surface roads running from Beitbridge through Masvingo town to Harare and the Eastern Highlands. The roads provide the interface between traders and tourists. Fifty eight percent of the markets had some form of shelter to protect carvings from bad weather conditions, 50% had pit-latrines, and 16% had piped water. Shelters ranged from pole and mud walls with thatched roofs to brick walls with corrugated iron roofs.

The equipment used in the woodcarving enterprise ranges from rudimentary to more sophisticated tools, but the latter are infrequent. Only one individual owned a chainsaw and most people use axes to cut trees. The chisels used vary from professional ones to those manufactured by local blacksmiths. It was observed that even professional chisels were locally modified at the end of their normal life to enhance their performance.

**Photo 1.** Primary processing of logs done adjacent to the market site (Photo by Wavell Standa-Gunda)



### Who is involved in the production and trading of woodcarvings?

Prior to 1980 women dominated craft production along the Masvingo-Beitbridge road, largely selling pottery. However, men, who focus mainly on stone and woodcrafts, currently dominate the craft sector (57% of market participants). Half of the women participants (total = 43%) are confined to markets where pottery and crochet products are being produced and sold (Table 1). When involved in carvings and sculptures, women restrict themselves to the final stages of production, the finishing of the product with sandpaper and polish, and the selling of the product. There is not a single female carver on the Masvingo-Beitbridge road, although many carvings end up with women who sell finished products. The men control most of the processes of craft production. The low levels of participation by females are made more apparent by the lack of involvement by young women in the craft sector. While craft production in colonial and precolonial times used to be the preserve of mature members, young males are now dominant in the market.

**Table 1.** Market participants along the Masvingo-Beitbridge road by activity, gender and age in 1997

Activity		No. of participants	Distribution by age grouping (%) in each activity group		
			<25 years	26-49 years	>50 years
Carving	Males	390 (11%)	6%	4%	1%
Selling	Males	1,696 (46%)	46%	33%	10%
	Females*	1,549 (43%)			
Total		3,635 (100%)	52%	37%	11%

\*The 583 female participants (38%) primarily concentrate on non-woodcarving activities such as pottery and crochet knitting, but occasionally do sell woodcarvings (main road survey).

The distance between homestead and the nearest market also influences participation in a market. As the distance increases it is especially the number of participating women that declines. Women are willing to travel around 2.0 km to 2.5 km to a market, whereas men move across districts and provinces. Men from as far as Birchenough Bridge (150 km), Harare (350 km), Bulawayo (300 km) and Bindura (400 km) take part in the trading of carvings on the Masvingo-Beitbridge road, though there are more local people than outsiders at each market. Household duties of women restrict their movement.

Carvers differentiate themselves into three broad categories. 'Artists', said to constitute 15% of the total number of carvers, are people renowned for the high quality their work. They have generally been in the business since long before the recent upsurge in craft activity. The next category, 'carvers', constitute about 30% of the total. Carvers are said to also produce good quality products, but were forced by economic circumstances to join the craft sector. The last category, 'part-time carvers', have also been forced into the sector by the need to raise cash. Their products are said to be substandard. This group usually includes farmers who want to supplement their agricultural incomes and



retrenched urban workers. Just over half of the participants involved in woodcarving are in this group.

Most participants in the craft sector are only partially involved, doing carving or trading in crafts when other livelihood options fail or in seasons when agricultural activities are less labour intensive. Generally, the ordinary households from the communal area are well represented in the sector. The participants interviewed gave no indication that certain kinds of households (in terms of wealth status, for example) were dominating the craft sector.

The distribution of market participants is somewhat skewed. Sese Craft Center, some 50 km from Masvingo, is the biggest and oldest market along the Masvingo-Beitbridge road, comprising 28% of all participants. The four next largest markets constitute 57% of the participants. The number of participants at each market was positively correlated to the volume and level of product diversity.

### What is traded in these markets?

In the 1960s market stalls along the Masvingo-Beitbridge road in Chivi District were mostly pottery outlets. The main resource, clay, is found on termite mounds close to most homesteads. However, as buyers acquired new tastes from markets in Harare and Bulawayo, stone carvings were introduced in 1976 at the Masvingo Craft School (which later became defunct). Stones found at most local sites, e.g. Chikofa, were less suited for carving so carvers travelled more than 50 km to collect good stones in Mashava or Zvishavane. However, this distance and the associated transportation costs became prohibitive for most people and thus it became common to substitute stone carvings with wood. At the beginning of the 1980s the marketing of woodcrafts began to gain prominence at Sese Craft Center.

**Photo 2.** A woodcarving market in Chivi district, Zimbabwe trading *Azelia quanzensis* and *Combretum imberbe* products (Photo by Wavell Standa-Gunda)



**Table 2.** Volumes and prices of woodcarvings according to species used for products on the Masvingo-Beitbridge road in 1997 (n = 27 markets, one time survey)

Main species	Volume (m <sup>3</sup> )	Average prices (US\$/piece)			Main product type
		Small (0.001 to 0.01 m <sup>3</sup> )	Medium (0.02 to 0.1 m <sup>3</sup> )	Large (0.2 to 0.5 m <sup>3</sup> )	
<i>Afzelia quanzensis</i>	79	4.7	28.8	342.9	Animals, abstracts
<i>Pterocarpus angolensis</i>	10	4.7	28.8	342.9	Animals, abstracts
<i>Combretum imberbe</i>	42	9.0	42.0	393.8	Human heads, figures
<i>Kirkia acuminata</i>	13	4.0	22.3	64.0	Animals (giraffes), mortars, cooking utensils
<i>Dalbergia melanoxylon</i>	5	5.4	11.2	—	Walking sticks, spears
<i>Spirostachys africana</i>	< 1	5.4	11.2	—	Walking sticks, spears
<i>Ozoroa insignis</i> ssp. <i>reticulata</i>	< 1	4.7	28.8	180.0	Animals (eagles)
<i>Albizia amara</i>	< 1	4.7	27.0	180.0	Animals
<i>Sclerocarya birrea</i>	< 1	3.5	18.0	45.0	Household items
<i>Berchemia discolor</i>	< 1	9.0	42.0	393.8	Human heads, figures
Soapstone	111.6	4.0	24.3	—	Animals, abstracts

At the time of the whole road survey US\$1 = Z\$11.30.

Source: Braedt and Standa-Gunda 2000.

The diversity of types of carvings is relatively high. The eight main product types are sold are produced from mainly six different tree species, thus increasing product variation even further to about 36 different wood products (Table 2). There is a close linkage between product type and the tree species used to produce them.

By far the most common species on the market along the Masvingo-Beitbridge road is *Afzelia quanzensis* (pod mahogany), followed by *Combretum imberbe* (leadwood), *Kirkia acuminata* (bastard marula), *Pterocarpus angolensis* (mukwa) and *Dalbergia melanoxylon* (African blackwood). Although over half of the products were made out of *A. quanzensis*, its predominance at most of the markets is not a reflection of its abundance in the forest.

### Pricing of products

The pricing of products is a complex issue. Prices are set as a result of knowledge of previous market transactions, characteristics of buyers and needs of the trader at the time of transaction. The buyer is usually characterised as either

a tourist or a local. The buyer's willingness to bargain indicated by exiting the car and moving around the market gives the trader extra time to bargain. The situation is different when the buyer remains in the car, asking prices through the window. Traders will then have to give buyers favourable bargains as they are likely to leave at any time. Through participatory activities with traders and buyers it was observed that buyers travel into Zimbabwe by road acquiring some information on product diversity and prices. By the time they travel back to South Africa, they will be more aware of the products they want to buy and the place to acquire them. Each trader bargains individually with the buyer until a price is established. Such 'private treaty' negotiations are very common in woodcarving marketing. As such the resulting fairness of prices depends upon the information, trading skills and relative bargaining power of buyers and sellers. Prices discovered in this way tend to vary with every transaction. Although individual traders transact with buyers, the information from the transaction is never private, but being shared amongst traders. This gives the woodcarving markets one characteristic of organised central markets. This information sharing is essential because traders are able to sell products controlled by other traders when those other traders are absent from the market. It is often the case that only a proportion of the market sellers are at the market at any one point in time (approximately 20%, depending on the time of the year).

## THE POLICY ENVIRONMENT

### Rules regulating markets

Only five of the markets in Chivi District on the Masvingo-Beitbridge road operate with the full approval of the Chivi RDC. The rest either operate illegally or their registration with the council has not been ratified. In 1992 the RDC, seeing the potential of the woodcraft sector to raise revenues for itself, levied a tax on all participants involved at the retail level. Because of labor shortages in collecting fees, the expected revenues were never realised. In the Masvingo Urban Council the market rules are more stringent (Table 3). For someone to be given a stall at the Masvingo urban market, the person has to be a 'resident of the town'. Defaulters on market rentals risk the disconnection of their residential water supply. Formerly, Mwenezi RDC, also along the Masvingo-Beitbridge road, charged a monthly rental of Z\$150 for marketing space and an extra monthly charge of Z\$30 for defaulters. By 1999 these fees had dropped, perhaps indicating a slackening of the system of rules. The fees reduced the development of the sector in that district as many people from Mwenezi cross the Runde River to market their products in Chivi District, where rules were less stringently adhered to. In Chivi, the level of control of markets by the district office is greater when the market has more participants.

Most markets on the Masvingo-Beitbridge road have a committee that runs the affairs of the market. Some barriers to entry in the craft sector exist as most markets have joining fees that range from Z\$10 to Z\$75 depending on the infrastructure of the particular market. These fees are paid to the committee that runs the affairs of the market. A common feature at most

**Table 3.** Differences in official operational rules regulating markets in districts along the Masvingo-Beitbridge road in 1997

District	Operation Rules		
	Participation in the market	Reasons for expulsion from the market	Payment of feed to council
Masvingo Urban Council	Should be a resident of the town. Payment of a registration fee of US\$4.5 to the council.	Non-payment of rental; sharing a stall with an unregistered person.	Monthly rental of US\$6.6 for the council controlled market stall. Stall was built by the council.
Masvingo Rural District Council	Entry into the sector is the prerogative of the market management committee. No joining fees or council rentals.	(The council has no control over the sector.)	None. Most of the markets operate on private or resettlement land. Council does not provide stalls.
Chivi Rural District Council	Ministry of National Affairs regarded as pre-co-operatives only markets that could present an organized structure (i.e., chairperson, secretary and treasurer) with records of accounts.	(The council has no control over the sector.)	No one pays the council for operating these markets. A tax was introduced in the early 1990s but could not be effected. Council does not provide stalls.
Mwenezi Rural District Council	Joining fees are paid at the council offices.	Non-payment of rental (but the payment system was abandoned in 1998).	People pay monthly rentals of US\$13.3, with an additional monthly fine of US\$2.7 for defaulters. Council does not provide stalls. The payment system was abandoned in 1998.
All	The Ministry of Roads controls where markets are located along the road, though with little success. Officials had in one or two cases requested relocations of markets to safer sites. by The Ministry of National Affairs had sporadically registered craft markets—none in Chivi District operate legally, but six are in the process of fulfilling the requirements for registration, e.g., having records of accounts.		

Note: At the time of the survey US\$1 = Z\$11.30.

markets is that the use of this joining fee is left to the discretion of the chairperson. New members who cannot pay the fee at joining are allowed to pay after their first sales. At times, the relaxation of rules has meant no rules at all. At only one third of the markets with rules on entry and expulsion have these been implemented since the markets came into being. In extreme cases membership is forfeited if an individual does not abide by the regulations of the market committee. Stealing other people's products, absenteeism from security duty at night and selling other people's products without accounting for the sale are reasons for which people get reprimanded or expelled.

Generally, expulsion of an individual depends on who they are and their position at the market. Important carvers and people such as the headmen are not easily fired. Relaxed entry requirements have meant that an expelled member from one market can still join or form another market.

Seasonality of rule enforcement is evident. During the peak tourist period (December to January) people tend to abide by the rules. However, in February and March there are many fewer buyers and traders and the traders flout the rules in order to make a sale. It is, for instance, not acceptable to disrupt another person's transaction by moving in with your own piece at a reduced price. This rule is often flouted when few buyers are visiting the market.

Leaders at smaller markets have the capacity to deal with matters of discipline and can easily influence other participants to follow the rules, but it is much more difficult to reach a consensus at the bigger markets. At Sese Craft Center, the 750 members (not all are always present at the market) could not agree on whether to build shelters. On the other hand, the 10-member group at Ngundu Craft Center managed to source funds and built concrete shelters in less than 10 years of its existence.

### **Legislation and rules governing the resources**

The NRB, the FC and the RDCs have conducted campaigns to enforce the legal regulations governing the utilisation of wood. This endeavor created mistrust between market participants and the authorities. There are four main legal instruments that relate to the wood resources in Zimbabwe. These are the Natural Resource Act of 1941, revised in 1975 and 1981, which created the NRB that controls the use of all natural resources; the Forestry Act of 1949, which created the FC and charged it with control of deforestation, amongst other functions; the Communal Lands Acts of 1982, which gives RDCs the rights to control the harvest of resources in their areas of jurisdiction; and the Communal Lands Forest Produce Act of 1987, which controls the harvesting of listed plant species from communal areas and regulates selling of tree species in communal areas. The latter act legislates that residents of communal areas may use tree resources for their own use but may not sell them, unless a permit is acquired. Most species used in the woodcraft sector are listed species and may not be cut, for example, *P. angolensis*, *C. imberbe*, *A. quanzensis* and *Spirostachys africana* (African sandalwood). The Communal Lands Acts of 1982 gives RDCs the rights to control the harvest of resources in their areas of jurisdiction. Although NRB and FC assist the RDCs in the enforcement of rules, the past has seen some haphazard raids on some of the markets, mainly by the FC, and subsequent confiscation of the products. But such enforcement is rare and, in general, the markets continue to operate with minimal to no interference from the state.

At the village level, the traditional leadership is the most important overseer of resource use. As there is no clear linkage between village authorities and RDCs, the council has little impact and local rules may differ significantly among villages. A number of village leaders have become involved in the woodcraft sector; they thus have difficulty justifying and enforcing traditional rules that limit the cutting of trees.

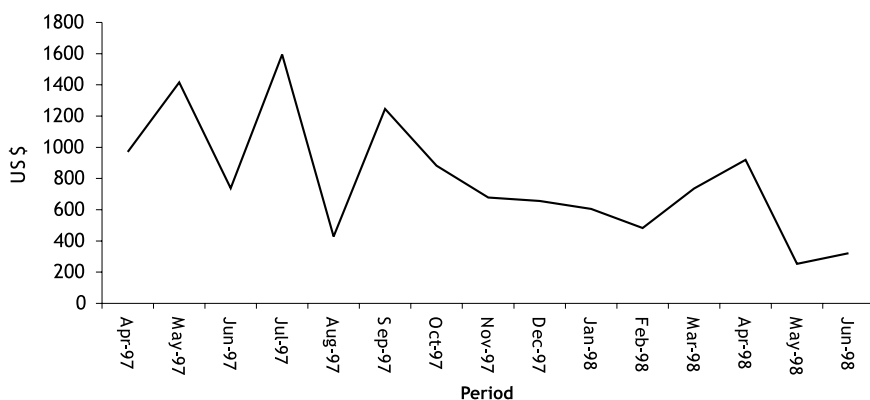
As carvers move farther away from their markets in search of logs, their control over accessibility diminishes as different rules and regulations come into play. Hence in those places where tree resources are still available, people from resource-deficit zones find access to those resources, legally or otherwise, difficult (Braedt 2002).

## TRENDS AND MARGINS IN THE WOODCARVING MARKETS

### Periodicity and trends in the marketing of woodcarvings

A detailed survey was carried out at three markets where there were 105 participants. Over the period of analysis from June 1997 to November 1998 the highest income from the sales of carvings was Z\$120,000 in February (Figure 3). This period is not associated with high numbers of tourist visits, making it difficult to use the seasonality hypothesis to explain these sales. The month of June, however, is a South African holiday season, and this is reflected in higher incomes for woodcarving traders. It would be folly to try to extract seasonal fluctuations of incomes linked to the fluctuations in tourism, as data from Figure 3 do not fully support such a hypothesis. The fact that the markets that have been assessed have low sales rates (trading an average of 18 products per month) could explain the lack of clear trends.

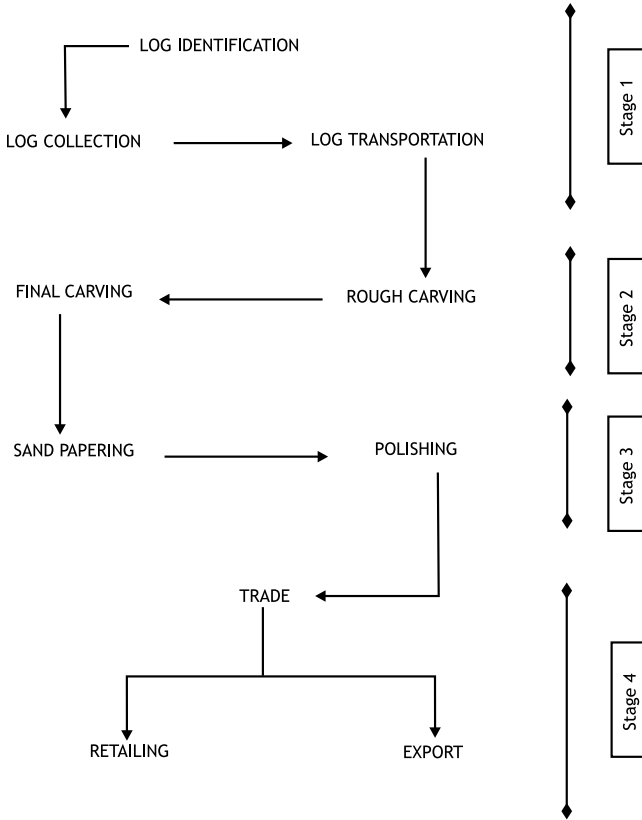
**Figure 3.** Monthly income from the sale of woodcarvings for three craft markets along the Masvingo-Beitbridge road



### Stages in the production of carvings

The woodcarving process involves four main stages (Figure 4). The first level is the acquisition of raw materials from the woodland and their transportation to the market or another carving site. Using an adze the wood is usually carved to a very rough stage, at the place where the tree is felled. This practice removes unneeded wood, so that only carveable wood is being transported. The second stage is the carving of the wood into the final product. The third stage is the finishing of the piece with sandpaper and polish, whilst the last stage is the actual selling of the carving.

Figure 4. Dominant market channel used by woodcarvers



### Net returns to labor from carving

Within the context of investigating fiscal instruments for promoting sustainability in the woodcarving sector the net margins to labor were calculated. A simple model that calculates the net return per unit hour of carver's time was developed for hippopotamuses carved from *A. quanzensis* (n = 55). Using the expected prices given by the carvers, the model shows that the net return to labour (including rough carving, carving, sanding, and polishing but excluding the cost of sales) was Z\$10.37 per hour (Table 4). Significantly, the net return per unit hour was two and one half times the Government Gazetted minimum agricultural wage for unskilled workers, which is Z\$4.04 per hour (Agricultural Labor Bureau personal communication).

Carvers prefer to purchase their raw material because the time required to identify, cut and transport a log to market (where most of the carving takes place) takes too much time. Respondents answered that they purchased 87% of their logs. Though purchasing of logs reduces carvers' perceived returns, the time saved is more valuable. There is widespread harvesting of timber from adjacent commercial farms. Although this practice is illegal it contributes about 13% of traded products. It is likely that carvers value their time at a much

**Table 4.** Net returns on labour from carving a hippopotamus from *Afzelia quanzensis* (n = 54)\*

	Mean price of wood (US\$/carving**)	Other costs recurrent (US\$/carving)	Total cost (US\$/carving)	Price of carving (US\$/carving)	Net margin (US\$/carving)	Net return on labour (US\$/hour)
Based on expected sale price***; no stumpage fees	4.89	18.53	23.42	45.16	21.73	0.92
Based on adjusted sale price***; no stumpage fees	4.89	18.53	23.42	41.09	17.67	0.75
Based on adjusted sale price; US\$400/m <sup>3</sup> stumpage fees	12.53	18.53	31.06	41.09	10.29	0.43
Based on adjusted sale price; US\$1,918/m <sup>3</sup> stumpage fees	22.57	18.53	41.10	41.09	-0.01	0.00

\* At the time of the market survey US\$1 = Z\$11.30. On average each carving takes 23.7 hours.

\*\* The first five data columns are expressed on a 'per carving' basis, where the average volume of log used for a carving was 0.108 m<sup>3</sup>, whilst the average final product produced was 0.043m<sup>3</sup>.

\*\*\*For each carving in the survey an expected price was solicited from the carver. The adjusted price represents the price more likely received. The adjustment was done through a survey of carvings for which expected and actual selling prices were available.

higher rate than the prevailing local wage rates and so it is entirely rational for them to purchase wood rather than to collect it themselves. This explanation is supported by studies of the woodcarving sector in South Africa, which have estimated that the time taken to harvest timber was the single biggest cost facing a wood carver (Shackleton 1996).

This simple model was further used to investigate the likely impact of the introduction of fiscal incentives for conservation. In practice the simplest form of fiscal tool would be a levy or stumpage fee paid by the carver or wood harvester to the community controlling the resource. To the carvers these fees would increase the costs of wood. Based on the FC's stumpage fee at the time



of the original studies from 1995 to 1997, Z\$400/m<sup>3</sup>, the introduction of a similar levy paid to the timber producing community would result in a drop in the net return for labour to the carver to Z\$4.79/hour. Using the same assumptions, a levy or stumpage fee of Z\$1,918/m<sup>3</sup> would reduce the net return to labour to zero. Thus a stumpage fee similar to that of the FC would make the woodcarving profession unattractive.

## CONSERVATION AND DEVELOPMENT LESSONS

Any proposal to introduce fiscal tools for conservation must consider the financial incentives to the producer community as well as the increased costs and willingness to pay by the resource users. It is possible to define a set of economic criteria under which institutional change is likely to occur (Ostrom 1998)<sup>3</sup>. These state that the net benefit of new institutions,  $NB_{new}$ , should strongly exceed the net benefit of the old institutions or lack of institutions ( $NB_{old}$ ) to the individual. Importantly, institutional change is not costless and the full costs of the proposed or desired changes need to be considered. These can be divided into four categories: the time and effort needed to devise and agree on the new institutions,  $C_1$ ); the direct costs of the new institutions,  $C_2$ ; the long term monitoring and enforcement costs of the new institutions,  $C_3$ ; and the opportunity costs foregone,  $C_{opp}$ .

If  $NB_{new} < NB_{old}$  it is highly unlikely that institutional change will be possible. If  $NB_{new} = NB_{old}$  or  $NB_{new} > NB_{old}$  then the probability of institutional change taking place is increased. Only when the net benefits of the new institutions strongly outweigh the net benefits of the old institutions, i.e.  $NB_{new} \gg NB_{old}$ , is institutional change likely to occur. In the context of fiscal incentives it is extremely important that these benefits and costs are clearly identified and quantified.

The preceding framework considers the probability of institutional change solely in terms of a cost-benefit analysis. A major constraint to any form of institutional change for the management of indigenous woodlands in Zimbabwe is the Communal Lands Forests Products Act, under which the woodcarving sector and many current uses of woodlands by communal land residents are illegal (Scoones and Matose 1993; Bird *et al.* 1995). This is because the act limits communal land households to non-commercial uses of woodland products, including wood. The only legitimate commercial marketers of wood and woodland products from communal lands are the RDCs, which can, in conjunction with the FC and NRB, grant authority to commercially extract timber. Because of the emphasis on criminalisation, and the unenforceable nature of much of the legislation contained within the Communal Lands Forests Products Act, the Land Tenure Commission Report (Rukuni 1994) recommended that the act be amended so that 'communal land farmers can collectively take responsibility for forests, forest resources, and produce in their areas'.

The experience of the Communal Areas Management Programme for Indigenous Resources (CAMPFIRE) provides a substantial body of evidence against which the probability of success of fiscal incentives for woodland management can be assessed. Analysis of the annual gross benefit at household level has shown that in half of the wards the financial benefits were relatively

low (Z\$34 per household). An analysis of these changes has suggested that the actual and even potential revenue that can be earned from wildlife is probably insufficient to achieve the necessary levels of institutional change for the management of wildlife and wildlife habitats.

The implications of the collective CAMPFIRE experience are critical in the assessment of the probability of success of fiscal incentives for woodland management in southern Zimbabwe. This research has shown that there is already a significant market for wood and that carvers are buying wood harvested in areas other than their immediate environments. This suggests that the main carveable species are already scarce within the communal lands where the markets are located, and that the creation of common-pool institutions for the management of woodlands is highly unlikely, solely on the basis of the financial incentives that can be generated from within the sector.

Important lessons for the woodcarving sector can be learned from Kenya, where both the scale and the intensity of the problem are far greater. Because of the scarcity of important carveable species, particularly *Brachylaena huillensis* and *D. melanoxylon*, carvers have substituted them with other species, most notably *Olea europaeae* ssp. *africana*, and *Combretum schumannii*. As carvers are aware of the threat of species depletion and the concomitant threat to their livelihoods, increasingly the exotic species of mango (*Mangifera indica*), jacaranda (*Jacaranda mimosifolia*), grevillea (*Grevillea robusta*), and neem (*Azadirachta indica*) are used as alternatives to the slow growing indigenous species (also referred to as 'good woods'). However, there is also a large scale illegal provision of indigenous wood to the carvers from state land and neighbouring countries such as Tanzania. This suggests that the government needs to urgently consider developing mechanisms whereby carvers, or the suppliers of wood to carvers, can legally access carveable species in the state forests. Without this provision it is likely that the illegal harvesting of wood will only escalate. In Kenya, another approach that has been tried is the provision of indigenous seedlings to carvers. However, a simple cost-benefit analysis of planting for the relatively fast growing *B. huillensis* shows that it is not financially viable (Bond *et al.* unpublished data). Whilst the provision of seedlings and the establishment of nurseries is aesthetically attractive, the absence of secure tenure over woodlands, the demand for land, the high grazing pressure and high interest rate make it financially unviable.

Under these conditions, it appears that the most viable options for ensuring the sustainability of the sector at the macrolevel are the following:

- First, to encourage the diversification of carvers to 'good woods', exotics such as jacaranda, neem, grevillea, mango and possibly some eucalyptus species. This can be done through programmes aimed at buyers and carvers.
- Second, the state should implement mechanisms by which carvers and wood merchants can legally obtain wood at market rates from state land.

## ENDNOTES

1. Center for International Forestry Research Regional Office for East and Southern Africa, No. 73 Harare Drive Northwood, Mount Pleasant Harare, Zimbabwe. E-mail: w.standa@cgiar.org
2. Institute for World Forestry, Federal Research Centre for Forestry and Forest Products, Leuschnerstrasse 91 D-21031 Hamburg, Germany. E-mail: braedt@holz.uni-hamburg.de
3. Ostrom (1999) defines seven design principles for common property management.

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## Chapter 12

# The *Pterocarpus angolensis* DC. based woodcraft industry in the Bushbuckridge district, South Africa

Sheona E. Shackleton<sup>1</sup> and Charlie M. Shackleton<sup>2</sup>

Common names	Part of the resource used	Management	Degree of transformation	Scale of trade	Geographic range
Kiaat, African teak, Murotso	Wood	Wild	Medium	National	Large

### ABSTRACT

Commercial carving and furniture manufacture using indigenous species, in particular *Pterocarpus angolensis*, harvested from communal lands has been a household activity in the Bushbuckridge district for several decades. It provides an important source of income for approximately 130 households in an area where the unemployment rate often exceeds 75%. Carvers produce utility items such as bowls, spoons and walking sticks that are marketed outside of the district through curio outlets and informal markets. Furniture makers produce mainly tables, chairs and benches for sale at the roadside in urban centres as far afield as Pretoria and Johannesburg. Production contributes approximately 75% to total household income. Incomes are extremely variable ranging between R4,416 and R14,328 per annum. Wood scarcity is fast becoming the greatest constraint to continued production and growth of the industry, despite *P. angolensis* being subjected to various controls as a protected species. Access to alternative sources of wood is essential, and efforts must be made to involve producers in managing the resource. New skills, products, organisational structures and perspectives are required to develop the sector further and bring local woodworkers into the mainstream craft and curio industry. This is particularly so in light of the strong competition from imports from other African countries and the formal sector.

## INTRODUCTION

In many parts of South Africa a diversity of forest and woodland species have long provided the raw material for the production of wooden household items (spoons, bowls, mortars and pestles, agricultural implements) and artefacts of cultural and ceremonial significance (sticks, drums, head rests). In more recent years, particularly in areas of high tourism potential, this traditional practice has expanded into an important income generating activity (Newton 1998, Steenkamp 1999a, b). One of the largest growth areas in the country for the woodcraft industry is the lowveld<sup>3</sup> region of Mpumalanga and Limpopo Province bordering the Kruger National Park (KNP). Although commercialisation brings welcome economic opportunity to otherwise isolated and remote rural areas, it also results in increased pressure on the resource base. This ultimately threatens both the sustainability of the resource and the livelihoods of the craftspeople dependent on it (Arnold and Ruiz Perez 1998). The impacts are especially profound where slow growing hardwoods like *Pterocarpus angolensis* DC. and *Dalbergia melanoxylon* Guillemin & Perrottet are favoured. This paper addresses some of these issues through a detailed description and analysis of the woodcraft industry in the Bushbuckridge district of the Limpopo Province lowveld.

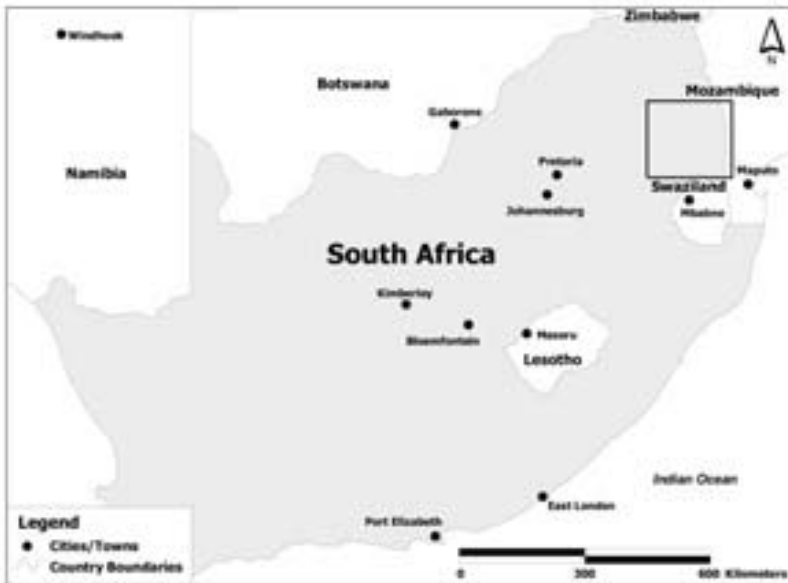
## STUDY AREA

The Bushbuckridge district (31° 0'–31° 35' E; 24° 30'–25° 0' S), corresponding to the Mhala and Mapulaneng areas of the former Gazankulu and Lebowa homelands<sup>4</sup>, covers an area of 2,417 km<sup>2</sup> (Figure 1). Approximately 23.7% of this territory is under state owned plantation forestry and conservation and inaccessible to local residents. This leaves an area of 1,843 km<sup>2</sup>, of which 84.9% is designated as communal grazing land (about 1,564 km<sup>2</sup>), 8.7% is rain-fed crop production, 2.9% is irrigated agriculture and 3.5 % is residential.

There is a strong gradient of decreasing rainfall from west (1,200 mm per annum) to east (500 mm per annum) across the district. Erratic rainfall and frequent droughts (once every four years) coupled with shallow, nutrient poor soils and land scarcity severely limit arable production and force most of the population to seek alternative means of livelihood. The natural vegetation is open woodland (subtropical dry forest, according to the Holdridge Life Zone system). The distribution of *P. angolensis* and other favoured carving species varies across the region, with higher densities found in the wetter western and southern parts of the district. The soils are mainly cambisols and regosols.

Projections from a detailed demographic study estimate the population at about 660,000 (Tollman *et al.* 1995). Population density is high at approximately 150 people km<sup>-2</sup> in the east and 300 people km<sup>-2</sup> in the west. Annual population growth rate is about 2.4%. Average household size is 6.2 people (Tollman *et al.* 1995). Unemployment runs between 40% and 80% (Pollard *et al.* 1998). There is a heavy reliance on the cash economy and on state grants, mainly old age pensions. Approximately 50% of the adult male population and 14% of women engage in migrant labour (Pollard *et al.* 1998). Average household incomes range from R178 to R1,131 per month, with most households living below the poverty line of R700 per month (Tapson 1996). Informal sector activities such as woodworking are generally entered into out of pure economic necessity.

Figure 1. Map of the study area



Source: ESRI Data and Maps 2002.

Infrastructure and services are poor, although water, electricity supply and road infrastructure have improved since the political transition in 1994. There are approximately 125 km of tarred roads within the study area, along with several hundred kilometres of good quality gravel roads. Bulk water supplies are available to most villages, but few households have private connections. National grid electricity is available to villages and peri-urban 'townships', serving approximately half the population.

Bushbuckridge was (and to some extent still is) a disputed area in terms of provincial boundaries, causing political problems and a lack of government commitment to the district. The uncontrolled pillage of *P. angolensis* from Bushbuckridge Nature Reserve has been but one of the repercussions following confusion regarding the division of responsibilities between provincial authorities. The wider region is an important tourist destination because of its proximity to KNP, numerous private game farms, and the scenic areas and towns of the Drakensberg mountain range. This has been a crucial factor in the development of the carving industry and has positioned producers and traders well for tapping the tourism industry.

## APPROACH AND METHODS

The information and data reported in this case study are based primarily on a detailed situation analysis of the woodcraft industry conducted in Bushbuckridge in 1992 and 1993 (Shackleton, S.E. 1993). This original study, in which an action research approach was adopted, involved in-depth interviews with 45 woodcraft producers as well as other role players in the craft industry including retailers and government officials. This primary material is supported by numerous secondary sources providing background information on the district (e.g., Shackleton *et al.* 1995; Pollard *et al.* 1998), the national woodcarving industry (e.g., Newton 1998; Steenkamp 1999a) and on the growth and harvesting rates of *Pterocarpus angolensis* and other carving species (e.g., Desmet *et al.* 1996; Clarke 1997; Shackleton 1997, 2002). A follow-up survey, in which much of the information was updated and augmented, was conducted in September 2000. This included interviews with woodworkers, conservation authorities, and representatives from various support organisations. All the main markets and retailers were revisited and traders interviewed.

The Rand/US dollar exchange rate in September 2000, when the new data were collected, was US\$1 = R7.00. Because of rapid devaluation, the exchange rate at the time of writing was US\$1 = R9.00. When the 1993 study was conducted US\$1 was worth approximately R3.10.

## THE BUSHBUCKRIDGE WOODCRAFT INDUSTRY IN CONTEXT

### History and cultural significance

Carving traditionally formed part of Tsonga culture, and the Tsonga people were well known for the headrests and walking sticks they produced (Shackleton and Adelfang 1992). This tradition has had little influence on the contemporary carving industry, however, in contrast with other parts of Africa, such as Cameroon, where



traditional artefacts like carved stools and masks still form a vital part of local culture as well as being sold commercially (Cunningham and Choge in press).

The use of *P. angolensis* for carvings and furniture commenced at the turn of the last century (Shackleton, S.E. 1993). Its value as a commercial timber was recognised and stimulated by the arrival of colonial settlers, who created a market for it. Indeed, white traders allegedly removed large amounts of timber from the area until as recently as the 1970s (Shackleton, S.E. 1993). Whilst the majority of home carvers and furniture makers in Bushbuckridge entered the industry in the last 15 to 20 years, a number have been plying their trade for over 50 years (Shackleton, S.E. 1993). This contrasts with the softwood animal figurine carving industry of the neighbouring district, which evolved and grew in the early to mid 1990s.

### **Impact on livelihoods**

High levels of unemployment combined with a shrinking job market, a lack of land for farming purposes and increased need for cash income have driven many households in the rural areas of South Africa to seek alternative income earning opportunities. Involvement in woodcarving and furniture production is one strategy that has been widely adopted in parts of the country where suitable carving species occur (e.g., Venda and Bushbuckridge in Limpopo Province, Mpumalanga, and the Zululand and Maputoland areas of KwaZulu-Natal) (Newton 1998; Steenkamp 1999a).

Craftsmen tend to enter the woodcraft industry following retrenchment (Shackleton, S.E. 1993; Moloi 1999a), some moving back and forth repeatedly between it and formal employment (Moloi 1999a). The ability to access wood and fashion it into saleable products is thus an important safety net and coping strategy for the unemployed. Based on a comprehensive poverty index, Steenkamp (1999b) found that the woodcarving industry supports the poorest sectors of the community, the households involved being highly dependent on the proceeds generated. Employment opportunities also are created for assistants, traders, informal vendors and retailers. Thus, the industry provides work for numerous people supporting a large network of dependents. It is estimated that more than 4,000 people benefit from the woodcraft industry in Bushbuckridge and the wider production-to-consumption system area.

### **Economic importance**

The woodcarving industry in South Africa is small relative to other African countries (see other case studies in this book), partly because of the limited distribution of suitable carving species and partly because there is no strong tradition of elaborate carving. Currently, at a national level, the economic value of imports from elsewhere in Africa is higher than that of the domestic carving industry (Steenkamp 1999a). Newton (1998) found that informal sector participation in the South African woodcraft industry generates about R2.48 million per annum, whilst vendors from southern, eastern and western Africa generate about R29 million (Table 1). In Bushbuckridge, the carving and informal furniture manufacturing industry was estimated to be worth about R365,000

per annum in 1993 (Shackleton 1996). Desmet *et al.* (1996) report trade in *P. angolensis* carvings and furniture amounting to over R5 million annually for Mpumalanga and Limpopo provinces. Although the industry is small, the impacts on the resource base and the conservation and development consequences are no different to other countries, while the situation is made more complex by the restricted distribution of many of the key carving species.

**Table 1.** The South African woodcarving industry in perspective: the value of the domestic industry relative to imports from elsewhere in Africa

Annual value of South African woodcarvings		Annual value of woodcarvings from southern Africa sold in the informal sector in South Africa	Annual value of woodcarvings from west and east Africa sold in the informal sector in South Africa
Informal sector	Formal sector		
R2.48 million*	R4.89 million	R5.8 million	R23.1 million

\* Note: The authors believe this value to be an underestimate as it was based on a very conservative estimate of the number of woodcarvers in South Africa. In 1998 US\$1 = R6. Source: Newton 1998.

## Regional and national context and production strategies

The Bushbuckridge woodcraft industry is imbedded in a wider, rapidly changing and complex craft industry that links the formal sector (factories and shops) with the informal sector (local producers, roadside stalls, flea markets) at sourcing, production and sales levels (Steenkamp 1999a). South Africa is both a producer of wood products and an importer, with the volume of imports increasing dramatically in the last five years following the lifting of trade embargoes (Steenkamp 1999a). Domestic production varies from low technology household or group-based enterprises that harvest their own wood (as described here) to large-scale, urban-based factories that acquire wood via timber merchants and produce machine made goods. All these businesses and their products compete for a place in the market.

Within the informal sector, two main categories of woodcraft producers have been identified based on their production and marketing strategies—roadside carver vendors and home carvers (Steenkamp 1999a, b). The Bushbuckridge producers described in this paper fall almost entirely into the latter category. By contrast, carvers from neighbouring Hazyview and Nsikazi typically are carver vendors. These two groups differ significantly in their modes of production, products, marketing strategies and types of wood used (Table 2) (Steenkamp 1999a).

## THE RAW PRODUCT AND RESOURCE BASE

### Sources of wood

Bushbuckridge producers obtain their wood primarily from wild populations in the communal lands, although some illegal harvesting occurs within

**Table 2.** Different woodcarving production strategies found in the region

Home carvers, Bushbuckridge	Roadside carver vendors, neighbouring Nsikazi
<ul style="list-style-type: none"> <li>• work from home</li> <li>• independent entrepreneurs</li> <li>• family-based production, women and children assist in finishing</li> <li>• use hard woods</li> <li>• produce utilitarian objects</li> <li>• sell to vendors and retailers</li> <li>• carving seen as a permanent livelihood activity</li> <li>• better equipment (chain saws, bought tools, power tools)</li> <li>• access to electricity</li> <li>• work in covered workshops or shelters</li> <li>• older industry—since 1970s and before</li> <li>• industry stable with few new entrants</li> </ul>	<ul style="list-style-type: none"> <li>• produce and sell from makeshift roadside shelters</li> <li>• groups of carvers or individuals</li> <li>• males, mainly young</li> <li>• use softer woods</li> <li>• produce animals and figurines (up to 2 m tall)</li> <li>• sell directly to tourists</li> <li>• transient, carving forms safety net in times of unemployment</li> <li>• low technology facilities (home-made tools)</li> <li>• no access to electricity</li> <li>• work in the open on the ground</li> <li>• younger industry—since 1990s</li> <li>• industry has grown rapidly and is still growing</li> </ul>

conservation areas. Seventeen species in total are used (Table 3). *P. angolensis* is by far the most important, followed by *Spirostachys africana*, *Dalbergia melanoxylon*, *Berchemia zeyheri* (Sonder) Grubov and *Olea europea* L. ssp. *africana* (Miller) P.S. Green (Shackleton, S.E. 1993). A few woodworkers obtain *Apodytes dimidiata* E. Meyer ex Arn. from private farms in a nearby commercial farming area. This case study analysis focuses on *P. angolensis* as the most favoured and most abundant species in the study area.

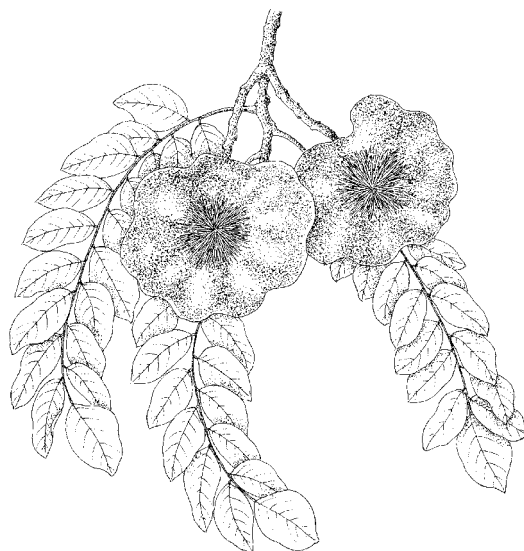
Because of scarcity of wood, especially over the last decade, alternative sources are being sought at the instigation of both craftsmen and support agencies. Recent work revealed that carvers are now accessing wood from neighbours' home plots and fields as well as revisiting previous harvesting sites to salvage 'waste' wood. Furniture makers reported purchasing *P. angolensis* planks imported from Mozambique and Zambia from timber merchants in Johannesburg, Pretoria and Nelspruit. The Danish Cooperation for Environment and Development Community Forestry Project and the KNP Socio-Ecology Programme have assisted woodworkers in obtaining wood from the national Working for Water Programme<sup>5</sup> and from areas cleared for mining and other developments (Yeatman personal communication). One carver-furniture maker successfully negotiated with a farmer to harvest the exotic species jacaranda (*Jacaranda mimosifolia* D. Don) and syringa (*Melia azedarach* L.) from his farm.

**Table 3.** Species used by woodworkers in Bushbuckridge and their main uses

Botanical name	Common name	Major uses	Conservation status
<i>Pterocarpus angolensis</i>	Kiaat	Bowls, spoons, plates, trays, furniture	Protected
<i>Dalbergia melanoxylon</i>	Black ivory/ zebrawood	Small dishes, spoons, walking sticks, candles sticks, small tables	Threatened throughout the region, scarce
<i>Berchemia zeyheri</i>	Red ivory	Walking sticks, spoons, forks, bowls, eggs, small tables	Scarce
<i>Olea europea</i> <i>ssp. africana</i>	Wild olive	Spoons, small bowls, eggs, walking sticks, small tables	Protected, scarce
<i>Spirostachys africana</i>	Tamboti	Trays, furniture, walking sticks	Protected
<i>Apodytes dimidiata</i>	White pear	Walking sticks, batons, eggs	Protected
<i>Combretum imberbe</i> Wawra	Lead wood	Furniture, walking sticks, plates and boards	Protected
<i>Acacia ataxacantha</i> DC.	Flame thorn	Teaspoons	Common
<i>Breonadia microcephala</i> (Delile) Ridsd.	Matumi	Bowls, spoons, small tables	Limited
<i>Terminalia sericea</i> Burch. Ex DC.	Silver cluster leaf	Furniture, trays, spoons, bowls	Common
<i>Dombeya rotundifolia</i> (Hochst.) Planchon	Wild pear	Spoons	Common
<i>Schotia brachypetala</i> Sonder	Weeping boer bean	Walking sticks	Limited
<i>Acacia nigrescens</i> Oliver	Knob thorn	Candle sticks, spoons	Common
<i>Albizia versicolor</i> Welw. Ex Oliver	Poison-pod albizia	Mortar and pestles	Common
<i>Sclerocarya birrea</i> (A. Rich.) Hochst	Marula	Stools, animals	Common
<i>Dichrostachys cinerea</i> (L.) Wight & Arn.	Sickle bush	Spoons, forks, bowls	Common and a bush encroacher
<i>Jacaranda mimosifolia</i>	Jacaranda	Bowls, spoons, animals	Exotic and invasive

Note: Species are listed in order of frequency of use.

Sources: Shackleton 1993, Newton 1998.



*(Pterocarpus angolensis)*

### **Harvesting procedure**

*P. angolensis* is a protected species (through various provincial laws and ordinances) and effectively state property. It must not be harvested without a permit. Trading in raw wood is prohibited, and in the former Gazankulu and Lebowa only local producers had legal access to wood. A variety of institutional mechanisms and processes apply to the harvesting of protected species in different parts of the country. In Bushbuckridge the system legislated under the Gazankulu Nature Conservation Act is essentially still in place, although this may change as the authorities amalgamate and develop new conservation legislation under the new provincial structures.

Previously, to access *P. angolensis*, producers required a licence that permitted them to practice (Shackleton, S.E. 1993). The permit was acquired through a fairly complex process involving tribal authorities, the local magistrate and the (former) Gazankulu Department of Finance. The licence made the holder eligible to harvest wood. Woodworkers without licences either harvested illegally, obtained a temporary permit or solicited wood from a licensed individual. This licensing system was rescinded following the incorporation of Gazankulu into Limpopo Province, easing the situation for those producers without licences and removing a significant barrier of entry to the trade.

Unlike the licensing system, the steps to obtain wood have changed little. The woodworker selects two to five trees within the communal lands. On felling, the trees are measured by the local ranger, who accompanies the producer on his harvesting trip, and the amount owed calculated (at R6 per running metre). The sum of about R250 to R400 per harvesting trip is paid in cash and a receipt issued. The stumps and logs are stamped to denote the legality of the harvest. The revenue is banked by the provincial Department of Agriculture and Environment (Tsweni personal communication).

This system relies heavily on law enforcement by rangers and tribal authorities. To date little attempt has been made to include woodworkers in resource management. Producers found with illegal wood (usually in periodic home raids) are apprehended and fined. Consequently, most craftsmen, while recognising the need for protection of the resource, do not support the current system (Shackleton 1993). Harassment, alleged corruption (rangers taking wood or issuing incorrect receipts) and a lack of credit to purchase wood were provided as further reasons for carvers' discontent. However, craftsmen expressed concern about the decline in the resource base and the increased appropriation of wood by external groups. Indeed, there is growing anecdotal evidence to suggest that many of the controls have broken down (Macleod 1999; Shabangu personal communication), mainly a result of institutional confusion and a lack of clarity regarding which authorities at both provincial and local level (i.e., local government or chiefs) are responsible for this function, as well as budgetary and capacity constraints. Recent efforts by Limpopo Province, however, are attempting to address this by supporting traditional leaders in reasserting their customary control over the natural resource base. A Deforestation Liaison Committee has recently been formed for Bushbuckridge.

### ***Ecological characteristics of P. angolensis and impacts of harvesting***

*P. angolensis* has few characteristics that favour its sustainable use as a carving wood. Although a fairly ubiquitous species occurring throughout southern and eastern Africa, its geographic distribution in South Africa is narrow and limited to parts of Limpopo Province, Mpumalanga and northern KwaZulu-Natal. It demonstrates poor sprouting ability (Shackleton 1997; Krynauw 1999), and most trees die after felling. Recruitment is episodic as illustrated by size class profiles (Shackleton, C.M. 1993; Clarke 1997). Tree density is low at about 2 to 3 adults per hectare (Desmet *et al.* 1996), although the total number of stems (seedlings and saplings) can be as high as 26 to 59 per hectare (Krynauw 1999). Little is known about its growth rate. *P. angolensis* has a peculiar trait of remaining as a suffrutex (small sapling) for a number of years, possibly up to 24 years (Vermeulen 1990). The cues that stimulate it to enter a phase of rapid vertical growth are unknown, but have been speculated as fire, browsing, a year of high rainfall or release from competition. Data collected by Shackleton (1997) over a period of seven years for 99 trees estimated that the time to reach a minimum harvestable size of 84 cm circumference (Desmet *et al.* 1996) was approximately 82 years.<sup>6</sup> The model derived by Desmet *et al.* (1996) between diameter and absolute mean annual increment based on one year's growth data resulted in an estimate of approximately 93 years. Neither of these includes time in the suffrutex stage. The length of time to reproductive age is also long. Shackleton (1997) found the smallest size of fruiting for *P. angolensis* was 25 cm circumference (about 36 years old), but only a few trees of this size bore fruit. Half of all trees 60 cm circumference possessed fruit (about 59 years old), and all trees 80 cm circumference (approximately 78 years old) or greater had fruit. Fruiting is regular and pollination and seed dispersal is by wind.

The rate of harvesting of *P. angolensis* in 1994 was estimated as 5.6% of harvestable individuals per year (Desmet *et al.* 1996). A simple Leslie matrix model indicated that this was unsustainable over the long-term. Clarke (1997) compared the demand data of Shackleton, S.E. (1993) with supply data (density and size-class profiles) for several species and similarly concluded that the current rate of demand is unsustainable. Certainly, wood scarcity has become a major concern for producers and has been the most significant change observed in the local industry. None of the harvesting sites mentioned in 1993 were still in use, and craftspeople were moving further north as well as looking to populations outside the study area for wood (Shabangu personal communication). However, recruitment appears adequate (Desmet *et al.* 1996), with producers commenting on the large number of young individuals that exist in selected areas. In particular, Bushbuckridge Nature Reserve has large dense stands of immature trees (Shackleton 1997; Shabangu personal communication), although most mature trees have been illegally removed (Macleod 1999). There is evidence that pressure on young trees is increasing as mature trees become scarcer, with some carvers harvesting small diameter trees for walking sticks.

### Policy and management issues

Newton (1998) has argued that at the national level the 'confusing and complex legislative situation in South Africa represents one of the greatest obstacles in the way of socially and environmentally appropriate development of the woodcarving industry'. Legislation presently under development should take cognisance of the socio-economic realities on the ground, so that disparaging confrontation between rural communities and conservation authorities can be avoided. Law enforcement needs to be downplayed in favour of greater participation of woodworkers in resource management, and perhaps local producers should be afforded some legal recognition that provides them with preferential rights of access to wood. Controlled access to wood within conservation areas, as well as the promotion of alternative species, would help to reduce pressure on currently exploited populations. Uniform legislation would contribute greatly towards an improvement in implementation and monitoring (Newton 1998).

At present there is no ecological management of *P. angolensis* outside of conservation areas. A management plan for this species in a communal area was drawn up by the Mpumalanga Parks Board, but not implemented (Krynauw 1999) owing to a lack of resources and poor organisational capacity in the local community. The extensive and intensive management of tree populations within communal lands is a sphere that requires urgent attention if the local extinction of key species is to be prevented. Some work in this regard has been done for timber and carving species in east Africa (Holmes 1995), and Vermeulen (1990) makes some suggestions for the management of natural populations of *P. angolensis*.

## PROCESSING INDUSTRY

### Production and income

Woodcarvers and furniture manufacturers using indigenous woods constitute only a small proportion of the total population of Bushbuckridge. Exact numbers are difficult to obtain, but there are an estimated 50 woodcarving and 60 furniture making households in the area supporting, directly and indirectly, some 2,000 employees and family members.

Carvers produce undecorated utility items such as bowls, spoons from ladles to serving spoons and teaspoons, platters, trays in a variety of sizes and walking sticks, which are marketed outside the district. Some items such as mortars and pestles, spoons and traditional sticks may be made for the local market on request. Less frequently produced goods include bangles, candlesticks, key rings, batons and eggs. Furniture makers can produce almost any item of furniture. These may be sold directly to buyers based on prior orders or sold on the roadside in urban centres as far afield as Johannesburg and Pretoria (Shabangu personal communication). One income enhancement strategy adopted by carvers between 1993 and 2000 has been to diversify into furniture production. This move was facilitated by connection to the electricity grid.

**Photo 1.** Range of woodcraft products produced by Bushbuckridge hardwood carvers (Photo by C.M. Shackleton)



Amongst producer households an average of 75% of cash income is derived from the sale of carvings and furniture. Other contributors to income include state grants such as old age pensions and disability grants (which account for most of the additional income), sales of products such as firewood, pottery, medicine and thatch, and cash earned from *ad hoc* activities like farming,



building, roofing and general repairs. In all cases, the producers themselves are the primary income earners in the household and, in general, furniture makers have a greater diversity of income sources than carvers. Total cash incomes for producer households in 2000 were estimated as R4,416, R23,084, and R14,328 per annum for carvers, carver-furniture makers and furniture makers, respectively (Table 4).

**Table 4.** Average net annual incomes earned by carvers and furniture makers in Bushbuckridge, 1993 and 2000

Year and 'form' of income	Carvers	Carvers-furniture makers	Furniture makers
1993 - Average net annual income <sup>a</sup> from sales of wood products	R1,710	-	R7,140
2000 - Average net annual income from sales of wood products	R3,603	R15,648	R7,065 (small sample, so a possible underestimate)
2000 - Average net annual total cash income (all sources)	R4,416	R23,084 (biased by one producer, who was participating in a range of entrepreneurial activities)	R14,328

<sup>a</sup>Net income is calculated as gross income minus costs (i.e., materials, travel, equipment, employees wages etc. but excluding own labour). US\$1 = R3.10 in 1993; US\$1 = R7.00 in 2000.

Production, sales and, consequently, income tends to be erratic, influenced by factors such as tourist season, amount, size and species of wood (no wood at all was a frequent problem encountered in the follow-up survey), working order of machinery, cash flow situation, success with selling stocks, and number and size of orders. Many of the woodworkers experience several months of the year without income (Shackleton, S.E. 1993). For these reasons, and because none of the producers keep books or records, income proved an extremely difficult variable to determine accurately in a once-off survey.

In 1993, in a 'good' month, net income<sup>7</sup> from sales ranged from R100 to R600 for carvers and from R500 to R2,750 for furniture makers (Shackleton, S.E. 1993). Average net annual incomes from woodcraft and furniture sales in 1993 were approximately R1,710 for carvers and R7,140 for furniture makers (Table 4). In 2000, the corresponding figures were R3,603 for carvers, R15,648 for carver-furniture makers and R7,065 for furniture makers (Table 4). Overall, these data are comparable to those for carvers from other rural communal areas (Steenkamp *et al.* undated). The longitudinal data indicate that although absolute values are mostly higher, incomes have not matched inflation and some households are possibly worse off than they were a decade ago.

The greatest costs for both groups are incurred during harvesting and marketing. The main input costs for harvesting include capital to purchase a chain saw, chain saw maintenance and fuel, payment of additional labour, travel costs for two or three trips to the harvesting site and the hire of a truck to transport logs home. The average annual harvesting cost is R3,459. Other overheads include the purchase of tools and consumables such as sandpaper and polish. Many woodworkers have invested in power tools over the last few years. Wages are another relatively high outlay. Furniture makers employ from 6 to 17 workers on a part-time or full-time basis, whereas few carvers employ additional help. Instead, most recruit the unpaid assistance of family members. Wages are variable and a common method of payment is a set rate per item completed. Men are usually employed for carpentry or carving work, and women for sanding and polishing. Unstable income was mentioned as the main reason for not employing assistants, or for employing them on a part-time basis only.

The returns relative to the cost of the raw material are high, the farmgate price of wood being approximately R0.60 per kilogram relative to an average of R46 per kilogram for finished products (Steenkamp 1999b). Known artists can obtain as much as R400 per kilogram. Wastage, however, occurs owing to design, poor tools, cracking, and borer damage. Much of the raw timber is thus lost. The local price for wood is highly subsidised and the value of *P. angolensis* timber in the commercial market is many times higher (R8,000 per cubic meter).

Major constraints to the industry, as perceived by woodworkers, include a lack of credit facilities and the consequent inability to purchase or hire sufficient machinery, tools, wood, and transport; wood scarcity; poor business and organisational skills; and a limited market. Two problems highlighted in 1993, i.e., difficulties obtaining licences and a lack of electricity, were no longer applicable in 2000. Buyers and external organisations have also identified poor and inconsistent quality, irregularity of supply, a limited product range and a lack of individuality, innovation and creativity as problems (Bristow-Bovey 1998).

Such constraints are not unique to woodcraft producers. The difficulties rural craftspeople experience in meeting the quality standards and aesthetic and fashion trends of high-value markets, as well as the logistical and financial constraints they face in the production process, have been highlighted by other writers (Marcus 2000; MDA 2000). Marcus (2000) concludes, for an area of KwaZulu-Natal, that 'presently craft production in poor households is beset by a lack of variety, variability in quality of output, narrow markets that are spatially and materially limited, and limited production flexibility'. The lack of access to microcredit also prevents producers who have broken into the market, and managed to secure large orders, from prefinancing the scale of production required to meet demand. The result is that 'the market is unforgiving: it moves on' (MDA 2000).

### **Levels of organisation**

Some researchers believe that poor organisational ability is one of the biggest limitations to growth in the woodcraft industry nationwide (Bristow-Bovey 1998; Steenkamp 1999b). Home crafters have always tended to operate independently, which has been both a strength and a weakness. The strength lies in the fact that these producers have successfully managed to earn a living for themselves

with little outside support. The weakness lies in the many missed opportunities for growth and development of the local industry because of failure to co-operate and make use of the considerable collective potential that exists. The last decade, however, has seen the formation of a number of producer organisations, of varying effectiveness, in the area.

The Mhala Woodworkers Association (MWA) was formed in 1993 (Shackleton, S.E. 1993). Its aims were to increase marketing opportunities, access external support, secure wood by collective means, and enhance co-operation between woodworkers. Since then, three woodworkers' associations within the broader region—the Nyongane, Mhala and Lubambiswano associations—amalgamated to form the Skukuza Alliance in 1997. This move was facilitated by the South African National Parks and is primarily market orientated, providing producers with covered markets adjacent to two of the entrance gates to KNP.

The MWA is relatively inactive although its existence has been important in securing donor funding and allowing carvers to participate in the Skukuza Alliance. One of the factors limiting the effectiveness of the MWA is the wide spatial dispersion of home producers who have neither time nor money to get together. Many members also favour operating on their own and demonstrate reluctance to share potential business opportunities.

The Skukuza Alliance is a formal organisation that has been effective in opening up marketing opportunities but has also had its share of organisational difficulties and conflict (abuse of positions of power, unaccounted expenditures, micropolitics etc.). Bushbuckridge carvers have reservations about aspects of its functioning and feel neglected in favour of the roadside carver-vendors. It is ironic that a lack of organisational capacity and co-operation should limit development and progress, but at the same time the formation of new organisations inevitably increases conflict and competition and leads to discord and a lack of trust between producers.

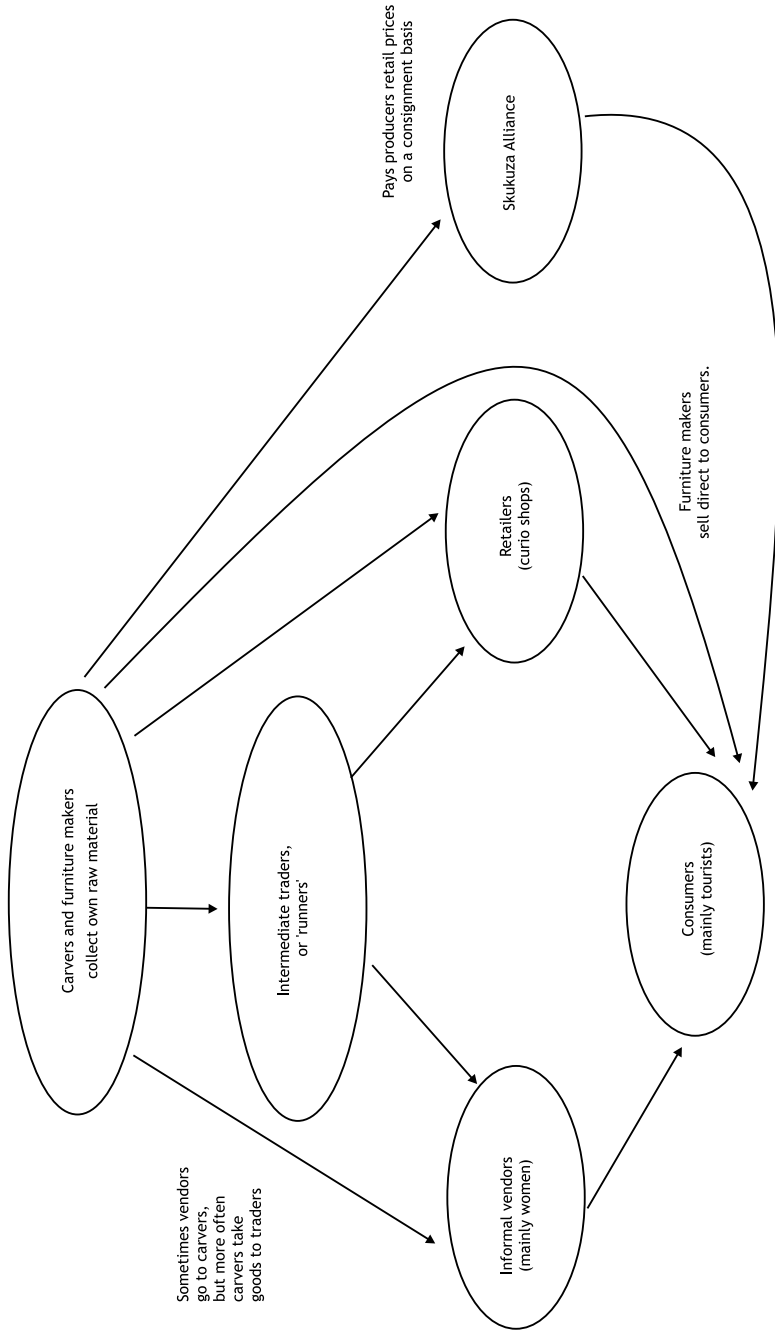
The woodcarvers in the former Lebowa area of Bushbuckridge formed their own association, which doubled as a lending club. This organisation ran into problems, however, when lenders failed to repay their loans and is currently dysfunctional.

## TRADE AND MARKETS

### Marketing

Most marketing is carried out by producers themselves on an individual basis (Figure 2). The road network in Bushbuckridge is fairly well developed and the majority of households are within easy walking distance (2 km) of a road and taxi route. Carvers make one or two selling trips per month, and furniture makers one every two months. For carvers, most markets are between one hour (Kruger Gate of KNP) and three hours (Pilgrim's Rest) away. Producers may take a day to visit all the main selling points (some 90 outlets). Furniture makers generally drive up to Gauteng (500 km), and usually stay there for a week or more selling at the roadside. Carvers usually travel by minibus taxi whilst furniture makers hire a small pick-up truck. The average cost to market goods is approximately R90 per month for carvers and as much as R2,000 per trip for furniture makers.

Figure 2. Market chain for woodcraft products from the Bushbuckridge district



The main markets for carvers in 1993 were craft shops located in and around six main towns of the tourist region: Hazyview, White River, Nelspruit, Sabie, Graskop and Pilgrim's Rest (Figure 1). While these markets are still important, a number of informal markets have emerged in the last 10 years following the relaxation of informal trading by-laws, which now serve as main outlets for carvers. Curio shops have instead moved towards stocking imported African goods. Steenkamp (1999b) found that, on average, there were more imported goods (55%) than local products (43%) in these shops. Of the local products, approximately 32% were produced by local factories, 10% by carver-vendors and only 5% by home carvers.

Some of the informal markets have further developed through interventions from government, primarily the Mpumalanga Department of Finance, and parastatal agencies such as the Mpumalanga Parks Board and South African Forestry Company. Support has included the provision of permanent cover, individual stalls, car parks and water and ablution facilities, creating a much safer environment for both traders and tourists. The markets are located along main tourist routes, the primary vending areas being Panorama Gorge, God's Window and Natural Bridge near Graskop, and MacMac Falls and Long Tom's Pass near Sabie (Figure 1). Committees oversee the management of the markets, and most have codes of conduct that traders must adhere to. Vendors usually pay a small fee (R5-R25 per month) for their stall. Tensions, conflicts and even factionalism between traders who operated in the area prior to the markets being formalised and new traders or those seeking places have occurred in some markets.

**Photo 2.** Local conservation authorities provide support to informal woodcraft markets (Photo by S.E. Shackleton)



Vendors are generally female. They purchase their goods from intermediate traders or directly from producers, selecting home carver products and imports from neighbouring countries, especially Zimbabwe and Swaziland. Local woodcarvings compose some 20% of stock. Most vendors were previously employed and have been vending for between two and eight years (Steenkamp 1999a). Eighty percent express high job satisfaction (Steenkamp 1999a), their economic independence (from men) being an important contributing factor.

Many of the carvers indicated they were 'tired' of selling to the women vendors because they pay such poor prices—usually about one quarter of the asking price (Table 5). But few can afford to pay more: their profits are marginal and cash flow is limited. Some carvers sell unfinished goods at lower prices to vendors, who then do the finishing. There is a similar arrangement with the shopkeeper at Kruger Gate. A number of retailers interviewed mentioned that they cannot compete with the prices charged by informal vendors and are unable to put a high mark-up on locally produced carvings. This reduces their interest in stocking local goods. Part of the problem is that the end consumer still expects to pay very little for locally produced craft products, especially if sold in the informal sector. The result is that producers and traders, because they operate on what is effectively a subsistence level, are at the mercy of the market and are frequently forced to accept unrealistic prices in order to earn sufficient money to pay the taxi fare home and to provide food for their families (Bristow-Bovey 1998) (Table 4).

Most carvers are now also marketing their goods through the Skukuza Alliance outlets. Prices are better (Table 5), but goods are sold on consignment and it can take months before producers receive any income. Nonetheless this market has been identified as one of the more positive developments in the industry over the last few years. Finances to run the outlets are generated by deducting 10% from the sale of each item. Although these markets appear to be functioning, there are some problems. These include the undercutting of prices by producers selling on the roadside (Moloi 1999a; SANP 2000), the fact that tourist bus drivers must be bribed before they will stop, selective support by the KNP administration (e.g., it declined an appeal by the alliance to allow the sale of drinks and snacks), and the lack of facilities to accept credit cards and to package and export goods for overseas buyers.

## **CURRENT POLICIES, SUPPORT AND INTERVENTIONS**

At the time of the original study there was virtually no external support for the woodcraft industry. Now, various agencies are investigating ways in which the industry can be developed, whilst simultaneously ensuring conservation of the resource base (Steenkamp 1999b).

Generally, in South Africa, government is paying more attention to stimulating the informal sector than it did in the past. The Department of Arts, Culture, Science and Technology recently adopted a plan to promote job creation and growth in four areas: crafts, music, publishing and film (Duncan 1999). This plan proposes the establishment of a Cultural Industry Development Agency (Moloi 1999b). There is also considerably more effort to encourage community-private sector partnerships in a range of sectors including crafts,

**Table 5.** Prices for selected goods in 1993 and 2000 at different points in the market chain

Products ( <i>P. angolensis</i> )	Average price at which goods were offered to traders/ consumers by producers in 1993 <sup>a</sup>	Average price at which goods were offered to traders/ consumers by producers in 2000	Average prices actually paid by vendors in 2000	Average prices paid by final consumers in 2000	Informal Markets*	Skukuza Alliance	Retailers
Bowl, large	R33	R79	R30	R120	R70	R120	R80
Bowl, medium	R15	R47	R20	R50	R35	R50	R40
Bowl, small	R10	R19	R10	R25	R20	R25	R25
Bowl, sauce size	R4	R5	R4	-	R8	-	R7.95
Oval steak plate	R9.50	R16	R8	R55	R25	R55	R22
Teaspoon	R1.80	R3	R1	-	R2.50	-	R4.95
Decorated walking stick	R35	R33	R15	R40	R25	R40	R40 - R130
Plain walking stick	R7.80	R10	R5	R30	R12	R30	R20
Salad server	R8	R10	R5	R25	R10	R25	R12.50
Cheese board	-	R25	R8	-	R25	-	R27.95
Small table	R65	R123	-	R150	-	R150	R175
Tray	R29	R63	R25	-	R50	-	R99.95
Dining suite (eight chairs)	R1715	R3833	-	R3833	-	-	-

<sup>a</sup> In the case of carvers this is the price at which carved goods were offered to vendors and retailers (see Figure 2), whereas in the case of furniture makers this is the price at which the item was offered to the final consumer.

\* Prices are flexible; price shown reflects effects of bargaining.

as highlighted in a national craft industry report (DACST 1998) and demonstrated by the interdepartmental Spatial Development Initiatives process. Although these policies have not yet filtered through to the local woodcarving industry, the situation does bode well for the future for a sector previously ignored by government.

At provincial and local levels there have been a number of initiatives targeting the woodcraft industry, most of which have already been mentioned and are summarised in Table 6. This has included support with marketing, skills and business training and the provision of wood.

**Table 6.** External support for the woodcraft industry in Bushbuckridge

Institution	Sector	Objectives/contribution/interest
National Department of Water Affairs and Forestry/Danish Cooperation for Environment and Development Bushbuckridge Community Forestry Project	Donor with government	Sustainable utilisation of woodland resource, improvement of livelihoods, capacity building, alternative sources of wood
UK Department for International Development	Donor	Market outlet at Kruger Gate
Mpumalanga Department of Sports, Recreation, Arts and Culture	Government	Create job opportunities, preserve skills (craft heritage), stimulate creative process
Mpumalanga Department of Environmental Affairs and Tourism	Government	Right to earn a sustainable living, sustainable resource harvesting
Mpumalanga Parks Board	Parastatal	Harvesting controls, informal market stalls
South African National Parks, Social Ecology/ Danish Cooperation for Environment and Development	Parastatal Donor	Economic empowerment, Skukuza Alliance, market outlets, integration into park activities, sustainability of carving industry
South African Forestry Company Limited	Parastatal Private	Markets
Seagram SA	Private sector (social responsibility programme)	Skills development for carvers, tools
Independent Development Trust	Non-governmental organisation/donor	Building of a workshop (this has not yet been equipped).

It is difficult to determine the effect these interventions have had on the woodcarving industry, particularly in Bushbuckridge. Preliminary reports are mixed. The impact of the Skukuza Alliance appears to have been positive, as the collective income of some 400 crafters rose from R2,000 to R50,000 within five months of moving into the Numbi Gate complex (SANP 2000). Numbi Gate is, however, distant from the Bushbuckridge woodworkers and they are much



more likely to benefit from the Kruger Gate development, which is still in its early stages. The facilitation of the two sales outlets appears to be the main strength of the alliance, whereas its performance as an association of craftspeople is questionable. One stakeholder declared ‘the Skukuza Alliance does not function, [but serves] only as convenience to get money in from the outside’ (L. Yeatman personal communication). Certainly, Bushbuckridge carvers had reservations about its ability to benefit producers.

Observations and discussions during the September 2000 revisit to the area suggest that the business skills and product development workshops (see Table 6) had little impact. Carvers are still producing the same product range, and the same difficulties were experienced obtaining data on income, costs and pricing strategies, indicating that few of the producers are operating according to business principles. Indeed it was surprising how little had changed considering that South Africa has undergone major political and institutional transitions in the last eight years. Home producers have been observed as a ‘difficult group to work with’, being reluctant to participate in collective initiatives and resistant to change. Most demonstrate a tendency to stick to proven, low risk products (Steenkamp 1999b), although it should be recognised that it is by no means easy for producers operating on a hand-to-mouth basis to carry the costs associated with experimentation.

## **SOME CONSERVATION AND DEVELOPMENT IMPLICATIONS AND RECOMMENDATIONS**

This case study has demonstrated that the woodcraft industry is a sector with potential for development and for providing rural communities with a viable source of income. Growth in the industry is evident, and all stakeholders expect it to grow further. Much needs to be done, however, to ensure that this happens in a positive and sustainable manner. Of particular concern should be management of the inevitable tensions between developing the trade and minimising environmental and biodiversity impacts.

### **Development of the industry**

The broader woodcraft industry in South Africa, as mentioned previously, is complex, and local producers are competing directly with African imports and formal sector factory goods (Steenkamp 1999b). Both these competitors tend to be high volume, wholesale specialists, whereas local craftsmen fit into a low volume, direct sales category and thus are unable to compete successfully in the wholesale or export market. Some development specialists feel that unless local producers find the means to enter this market (see Kenya case study), they will continue to be marginalised, invisible to formalised business and commerce, under threat by more organised sectors of the industry and vulnerable to exploitation and the day-to-day uncertainties of a subsistence existence—especially since the local niche market appears to be already saturated (Steenkamp 1999b). A number of external agencies believe that local carvers could compete more successfully in the wider market if they were to focus on a range of small, specialised products following the Mexican

success story (Steenkamp 1999b). Others suggest that products with more 'cultural' or 'artistic' significance should be encouraged. However, this usually requires intrinsic artistic talent rather than just craftsmanship, thus benefiting only a limited number of carvers. It is also a fickle market, prone to boom and bust characteristics, as evidenced by the collapse of the Venda art market even after many of the sculptors had attained international acclaim (Duncan 1999). New specialised, but less tourist-dependent, markets could also be explored. For example, one restaurant in the Sabie area is furnished effectively with locally produced *P. angolensis* furniture, and another is using salad bowls, steak plates and pizza boards carved by home carvers. There is no reason why this practice could not be extended to other parts of the country.

Whatever the way forward, Steenkamp (1999b) stresses that a specialised marketing study needs to be conducted before any decisions are taken. Such a study should take into account a long-term development framework for the woodcraft industry, as well as any changes in production mode and strategy that would accompany the targeting of new markets. Certainly, entering the wholesale market presupposes increased organisational specialisation and co-operation amongst producers, perhaps within a small factory situation—something towards which carvers have demonstrated reluctance. Joint partnerships with the private sector have also been suggested, and there are examples within the basketry industry. Such an approach would provide the capital injection to set up bulk production and provide a guaranteed market for at least some products. In the end, it is likely that a mix of different strategies and markets, suiting a range of producer needs and preferences, would be most appropriate. It is important that what has been achieved so far, mainly through the enterprise of producers themselves, not be ignored. After all, the woodcraft trade has been able to provide one of the poorest sectors of the Bushbuckridge community with a means of livelihood since the early 1970s (Shackleton, S.E. 1993). From this perspective it is also critical that any new development does not create unhealthy dependencies on agencies, companies or products that may have short-term horizons or unpredictable futures.

## Resource conservation

The impacts on key carving species, in particular *P. angolensis*, have been substantial. A response to this situation in other parts of the world has been to turn to propagation and cultivation. This strategy has been most successful in the case of fast-growing softwood species. *P. angolensis* has, however, proven extremely difficult to cultivate, and most attempts to grow it have met with limited success throughout the southern African region (Vermeulen 1990). It is also very slow growing. Cultivation is therefore unlikely to be a solution to the wood supply problems for *P. angolensis* users. Instead substitute species, including exotics, and alternative sources need to be identified. Better management of the existing resource base is crucial, but highly complex. Carvers and furniture makers are not the only users of communal woodlands, and different stakeholders have variable and contended understandings of boundaries and *de facto* access rights. Moreover, existing institutional and legal arrangements are confused,

controversial and ineffective. Any community-based management plan would need to be a broad contract involving various user groups and authority structures, and would need to recognise the dependency of producers on the resource. Thus, whilst it may be difficult to restrict the use of mature trees, there could be improved and more active management of young trees and saplings. As discussed for the development of the trade, a multipronged approach involving all of the above strands is likely to be most effective, although it is important not to romanticise the notion of sustainable use. Indeed, so long as there is wood and the opportunity to earn an income from it, rural households on the breadline will continue to appropriate the resource to feed their families. They simply cannot afford not to.

## **SUMMARY AND CONCLUSIONS**

The woodcraft industry in Bushbuckridge makes a significant contribution to the livelihoods of a small sector of local residents. The impacts of decades of wood use are now apparent and wood scarcity is fast becoming the greatest constraint to continued production and growth. Although there has been an increase in external support for both producers and traders in the last five years, much of it is piecemeal and uncoordinated. A more focussed long-term effort by all key stakeholders is necessary if a sustainable industry is to be achieved. This presents a considerable challenge. Access to alternative sources of wood is essential. Producers also need to be more involved in management of the existing resource base. New skills, products, structures and perspectives are required to bring woodworkers from the margin into the mainstream craft and curio industry. Lessons from other African countries and elsewhere should be incorporated into new development strategies. Consumers need to be made aware of the value of the wood and the time and effort required to produce woodcarvings and handmade furniture. Local products should be promoted and be seen as having a special niche in the market instead of being regarded as inferior to imports or factory produced items. If these issues are addressed, then there is hope and a future for the woodcraft industry in the Bushbuckridge lowveld.

## **ACKNOWLEDGEMENTS**

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## **ENDNOTES**

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2. Environmental Science Department, Rhodes University, Grahamstown, 6140 South Africa. E-mail: c.shackleton@ru.ac.za
3. The term lowveld refers to the relatively flat, low-lying, semi-arid savannah region in the north-east of the country positioned between the Drakensburg escarpment in the west and the Mozambique border in the east.
4. Homelands, constituting 13% of the surface area of South Africa, were created as labour reserves legitimated by a complex of apartheid ideals and policies that emphasised the importance of separate development. They were the only areas where black people could access land, which was held in 'trust' by the state and administered through the tribal authorities. In the early 1990s, all homelands were reincorporated into South Africa.
5. Working for Water is a national programme of the Department of Water Affairs and Forestry aimed at clearing invasive alien vegetation from catchment areas and riverine zones to enhance water production, biodiversity and local employment opportunities.
6. Calculated using the function: percent annual basal area increment =  $-0.161$  (stem circumference) + 14.49 ( $r = 0.984$ ;  $p < 0.001$ ), and assuming a starting stem circumference of 3 cm.
7. Net income in this case is calculated as the cash income generated from the sales of products minus costs including consumables, tools, transport to market, wood harvesting and wage labour. Cost of own labour is not included.

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## Chapter 13

# Fuelwood in the Maroua area of the Far North Province of Cameroon

*Tata Precillia Ijang*<sup>1</sup>

Common names	Part of the resource used	Management	Degree of transformation	Scale of trade	Geographic range
Seyal, White-galled acacia, Ulbe	Wood	Wild	Low	National	Large

### ABSTRACT

This chapter reports on fuelwood in the Maroua area of the Far North Province of Cameroon. Wood harvesting is the third most important economic activity for the inhabitants of this area, after animal husbandry and agriculture. Fuelwood is harvested, processed, marketed and consumed exclusively in the Maroua area, moving from collectors through wholesalers and retailers to consumers. Whereas in the past only dead trunks and branches were gathered for use as fuelwood, today live trees are felled and left to season. The result has been a dramatic disappearance of forest cover, with trees being harvested at unsustainable rates. Since fuelwood sales are a major source of income for most households, it is difficult to stop the felling of live trees, despite the negative impact on the forest and enormous efforts by the government of Cameroon and various non-governmental organizations.

### INTRODUCTION

Non-timber forest products are obtained from both plant and animal sources, and include fruits, nuts, oils, medicinal plants, arabic gum, other foods, bush meat, bark and wood as an energy source and for artisan purposes (Neba 1987; Agroforestry Project 1995; CEDC 1997; Peter 2001). Our interest in this study was the use of wood as an energy source in the Maroua area of the Far North Province of Cameroon, with *Acacia sayel*, a locally abundant and popular fuelwood species (ABF 1989; CEDC 1997), taken into particular consideration.

The use of wood as a source of energy contributes to environmental degradation as well as income generation around the world, including Cameroon and our study area. A study published by the Food and Agricultural Organization

of the United Nations illustrated the increasing annual trade in fuelwood around the world, while documenting increased pressures on local resource bases (FAO 1998). For example, Indonesia has emerged as a principal producer and exporter of fuelwood, while others such as Germany have become importers. These same trends are shown in Cameroon. Table 1 shows the steady increase in fuelwood production between 1992 and 1996 in Cameroon and the world.

**Table 1.** Fuelwood production in Cameroon and the world between 1992 and 1996

Year	Cameroon (000 cubic meters)	World (000 cubic meters)
1992	4,264	1,471,897
1993	4,342	1,484,632
1994	4,426	1,505,966
1995	4,526	1,519,972
1996	4,910	1,552,866

Source: FAO 1998.

For centuries fuelwood has remained an affordable and reliable source of domestic energy for the rural populations of the developing countries (FAO 1990). In Cameroon it constitutes 60.5% of the total energy consumed in all sectors and 85.5% of the energy consumed in households (FAO 1990). Assan (unpublished) wrote that fuelwood made up 67% of the total energy consumed by urban households, and 100% of that consumed in the villages of the Maroua area. In 1999, Tata (1999) estimated that consumption stood at 586 kg/person/year in Maroua, with an annual per person cost of CFA13,300, or US\$22.17 (exchange rate US\$1 = CFA600). In comparison, Sow (1990) found that fuelwood consumption stood at 637 kg/person/year in Mali and 230 kg/person/year in Niger. Costs per person per year were estimated at CFA4,600 (US\$7.67) in Niger, and CFA12,100 (US\$20.17) in Mali.

In the past wood harvesting in the Maroua area was mainly for home consumption, and it was mostly women who gathered the dry branches and trunks of trees and shrubs for fuelwood (Awah 1995). Today the situation has changed, as increased commercialization of the sector has led to the widespread harvest of both dead and live branches and trunks by men and women (Awah 1995). Factors determining the quality of good fuelwood include a high level of heat generation, little smoke, the production of good charcoal and little wood ash. Apart from its increasing commercial value, factors encouraging the use of fuelwood include cooking habits, purpose of cooking, family size, social rank and food type (Montalembert and Clement 1983; Munslow *et al.* 1989; Robin and Leach 1989; Musa unpublished).

## THE PRODUCTION-TO-CONSUMPTION SYSTEM

### Resource base

This chapter addresses the woodlands of the Maroua region of the Far North Province of Cameroon, where the increasing amount of fuelwood being removed



from this Sahelian region is of particular concern (Awah 1995). Although many species are gathered as fuelwood, we chose to highlight the case of *Acacia seyal* (Mimosaceae) because of its high regeneration capacity, the abundant availability of data, its abundance in the study area and its high quality as fuelwood. *Acacia seyal* grows abundantly in almost every part of the Maroua area of Cameroon and occurred at levels of at least 20 trees/km<sup>2</sup> in our study area. Regeneration is rapid and seeds germinate and grow to maturity with little or no assistance unless disturbed by browsing cattle or bush fires. In addition to its value as a source of fuelwood, *Acacia seyal* may be used for timber, animal fodder, arabic gum, food, medicine, and amenity and soil improvement (Agroforestry Project 1995; CEDC 1997).



(*Acacia seyal*)

*Acacia seyal* has different common names depending on the language, e.g., *mimosa epineux* in French, *sade* in Bambara, *saykire* in Djerma, *ulbe* in Foulfoulde, *erehi* in Hausa, *boulbi* in Peulh and *fonah* in Wolof (Von Maydell 1990). Its growth requires an annual rainfall of 250 mm to 1,000 mm on sandy, loamy or clayey soils and permits periodic inundation and desiccation. Growing at a rate of more than 1 m annually, full growth is attained after about 10 years (Von Maydell 1990; Roussel 1995). At maturity the tree is about 17 m tall with a diameter of about 60 cm and an umbrella-shaped crown. The bole bark is green in younger trees, turning a dark gray in older trees, with paired thorns about 7 cm in length. It has a yellowish, gummy sap. The dark green leaves are complex, with 4 to 12 pairs of pinnae and 10 to 22 pairs of leaflets. Rachis are up to 8 cm long and flowers are bright yellow. Its seed pods are slightly curved, indehiscent, light brown at maturation, 10 cm to 15 cm long and 1 cm wide, containing 6 to 10 seeds each (ABF 1989; Von Maydell 1990; CEDC 1997; National Forestry Development Agency 1997).

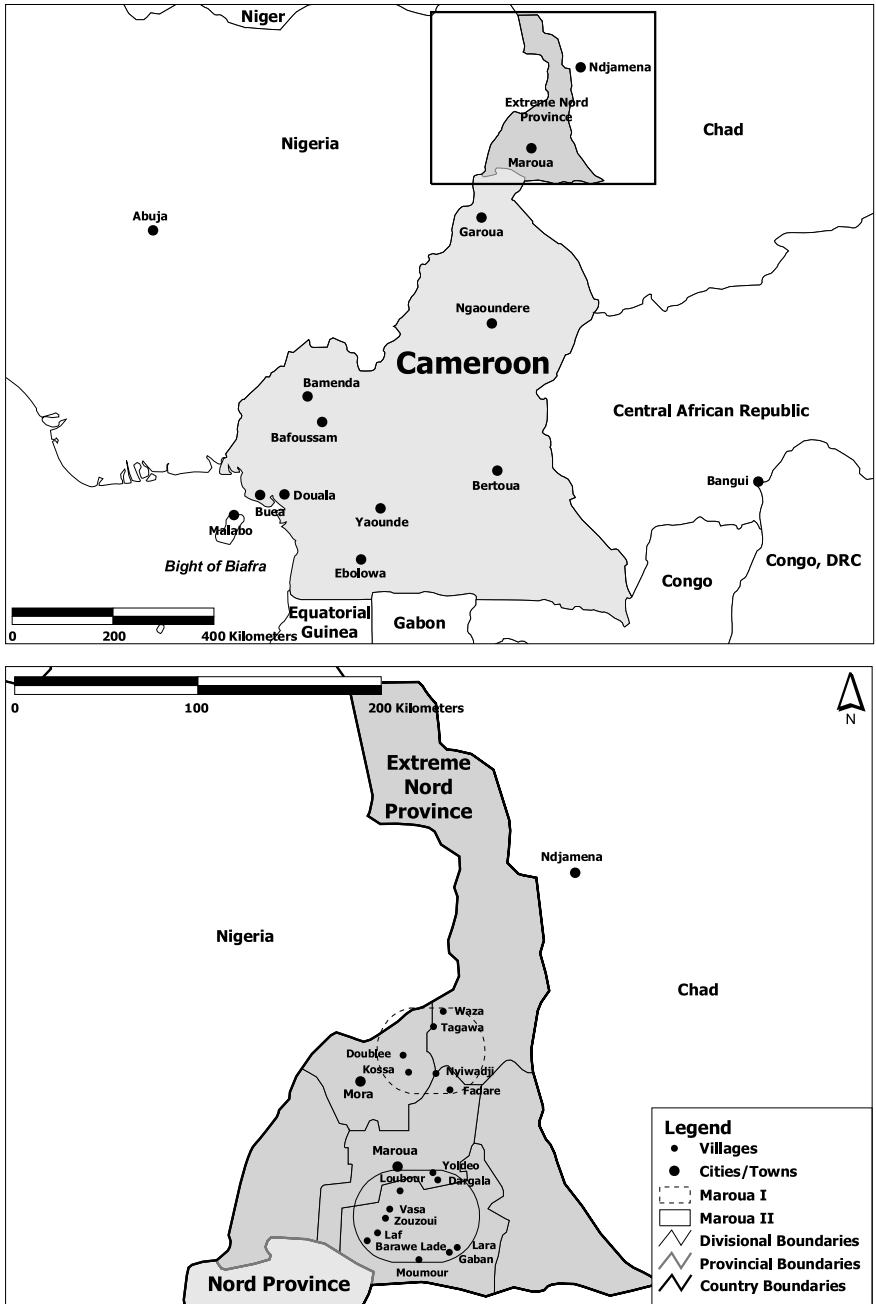
## Raw material production area, producers and socio-economic context

The area of this study included the villages of Fadere, Niwaji, Laf, Jagara, Gaban, Vaza, and Kossa in the Far North Province of Cameroon as well as Maroua, the capital city of the province (Figure 1). These villages represent the geographical region that produces most of the fuelwood found in the Maroua main market. Located in northern Cameroon, the study area falls between latitudes 10° 01' and 10° 47' north and longitude 14° 11' and 14° 55' east (Fotsing 1997) and has a mean elevation of 400 m (Ngwa 1978). During the long dry season, the nights and mornings are often very cold, while extremely hot daytime temperatures in Maroua range between 19°C and 40°C. The rainy season, brought by the southwest monsoon winds blowing across the Atlantic Ocean from the Gulf of Guinea, is very stormy, and the annual rainfall of 700 mm to 1000 mm falls in just the three months from July to September (Neba 1987). Benefiting from the Guinea monsoon climate, the main vegetation cover is characterized by a formation of mixed tree shrubs and forest savanna (ABF 1989), which Leemans (1998), following the Holdridge classification system, classified as 'very dry tropical forest'. Many of the native plants have developed specialized structures to enable them to survive these harsh climatic conditions, such as deep root systems, few and small leaves, thorns, thick bark, and the shedding of leaves during the dry season (Raven and Johnson 1986; Robert 1986; Agroforestry Project 1995). The harsh, dry environment of the study area had been exacerbated by drought, and consequently the vegetation cover was very stunted and sparse, with bare soil exposed in some areas. Plant regeneration was very slow—increasing the rate of forest disappearance already occurring because of overharvesting and natural events (Grainger 1993).

The study area constitutes about 17.7% of the total population of the country and was made up of many tribes including Moundang, Toupouri and Foulbe amongst others (*Review de Géographie du Cameroun* 1996; Zoa unpublished; Minister of Economy, Finances and Industry 1999). The most prevalent religion is Islam, though Christians and animists are also present (Van Well 1998). The most important economic activities are animal husbandry, agriculture and woodcutting, trailed by fishing and petty trading (Waffo 1996). Of the three main activities carried out by the local population of this area, animal rearing was not labor intensive since the animals were allowed to graze in the wild. This was because production was mainly for subsistence, cultural uses and local sales. Agriculture, though fruitful, was not as productive as expected because of the dry climate and drought. In consequence, the population has three very farm labor-intensive months during the year. Given the subsistence level of animal husbandry and farming and the consequent lack of cash income of most households, many turn to woodcutting with its ready and growing market (Waffo 1996).

Woodcutting is labor-intensive work performed mostly during the non-farming months. It represents the most immediate source of cash income for most households as well as the source of fuelwood burned in households during the labor-intensive and rainy farm season. Wood harvesting is mostly done in the cool temperatures of the early hours of the day, while sales take place in the afternoon. The trade, processing and marketing of fuelwood took place

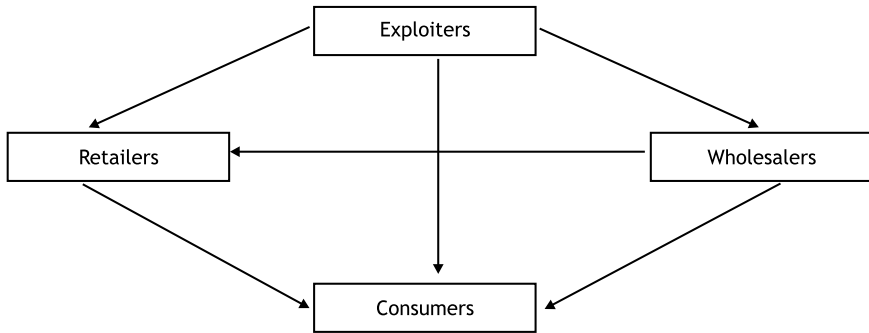
Figure 1. Map of the study area



Source: ESRI Data and Maps 2002.

entirely within the study area, though small quantities are exported to Chad and Nigeria on a very rare and informal basis.

**Figure 2.** Simplified fuelwood exploitation and marketing agents' chain



Source: Tata 1999.

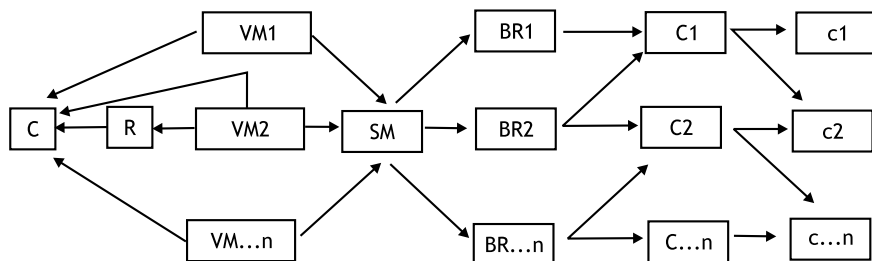
### Chain of production and trade

The chain of production and trade is quite short, passing from the forest and village markets through the urban markets and to the consumers. This is most clearly depicted in Figure 2, where the directions of the arrows indicate the movement of wood from exploiters to consumers.

The main processing of this product consisted of splitting logs and big branches into halves and smaller pieces. Wood marketed as large, medium and small halves was what consumers most preferred. A result of this processing was the addition of value; split halves were worth more per unit than logs. At each stage in the marketing chain, the seller captured value by splitting the wood into smaller pieces. The only by-product from the processing and consumption of this product was charcoal, and its use was insignificant to the producer-to-consumer chain in the study area.

Some of the fuelwood gathered was consumed by the exploiters, and passers-by in the village also purchased wood for consumption and retail. However, wholesalers served as the main middlemen between villagers and urban consumers. In urban areas, wholesalers sold the wood to retailers, who finally sold it to consumers. The modified chain of production or fuelwood *filière* presented in Figure 3 explains this process in greater detail.

Village markets situated in the forest and roadsides sold to wholesalers, retailers and some consumers. Sellers in the forest markets were mostly young men, whereas at the roadside all classes of people were found, and about 30% of them were women. Most of the wood harvested in the villages for household use was harvested by women and younger children (Awah 1995), and was transported on head, animal, truck and bicycle. Because women were busy with other household tasks, and their husbands' permission was needed for them to be involved in any external activity, their involvement in wood sales was minimal.

**Figure 3.** Fuelwood *filière* model

- VM1...n : Village markets  
 SM : Suppliers market (wholesalers)  
 BR1...n : Urban markets (big retailers)  
 C1...n : Small neighborhood markets  
 c1...n : Final consumers  
 R : Small retailers  
 C : Consumers

Source: Tata 1999.

Wholesalers did not have a fixed market, sold exclusively to retailers, and were all men. Most of the wood, in logs and split-halves (more desired by consumers), was purchased from the village markets and transported, sometimes up to 200 km, to the urban center using 6 and 10 tonne trucks. Suppliers usually bought on order and already had a market where to sell the product before they went to the village markets.

The big retailers at urban markets included two categories of traders: those buying wood from wholesalers and who sold exclusively at wood markets, and those buying wood from village markets and who drove around urban neighborhoods selling from their vehicles. Retailers buying from villages transported the product using mostly the bigger Dina Toyota pickup trucks as well as regular pickup trucks and bought mostly small halves and branches obtained from immature trees (lower quality wood from findings). They did not travel far to buy the wood (less than 70 kilometers from the urban center). In both cases they sold to small retailers and consumers and they were all men. Some of the large harvested branches were used in the urban centers as poles for supporting dilapidated houses, while others were used for the building and roofing of houses.

Sales between small retailers and big consumers took place exclusively in small neighborhood markets and in front of households. More than 80% of these retailers were women and young children (Awah 1995; Tata 1999). People who gathered wood from degraded forests around the urban center and from other sources were also represented in this category. Most of the wood was of poor quality.

Final consumers such as urban households, meat roasters and restaurant owners made up 67% of the total energy consumed in the urban center (Assan 1991).

Woodsellers sold to whomever they chose, at any time. They were often needy, jobless men who moved on to other activities as soon as possible.

However, as the marketing of fuelwood has become more intensive, some rich businessmen (mostly truck owners) have become involved as wholesalers. Others have bought trucks and hired drivers to work as wholesalers.

**Photo 1.** A pickup truck loaded with fuelwood plies the neighborhoods of Maroua in 1998 (Photo by T.P. Ijang)



## TRENDS AND ISSUES

### Dynamic changes

The most noticeable change in the landscape within the study area was the disappearance of the natural forest, and the disappearance of some indigenous species was echoed in the arid landscape covered with tree stumps and sand. Efforts to improve the environment had been made through the creation of parks, forest reserves and protected areas and waters. Though initially most of the environmental protection strategies were developed and executed by the government and various non-governmental organizations (NGOs), increasingly villagers are being involved in the process (Republic of Cameroon 1994; Agroforestry Project 1995; Minister of Environment and Forestry 1998). For example, NGOs and the government have helped to establish village-based groups to aid in the planting of species of trees that have otherwise vanished from the environment (DPGT 1996).

Trade in and demand for fuelwood is increasing in Cameroon, but the supply to markets can be inconsistent, especially during the rainy season, when the bad roads, the long distances, and the high cost and difficulty of vehicle hire

slow the harvesting activities. Increased demand has led to an overharvest of wood, leaving the landscape full of tree stumps and young trees exposed to the threats of grazing and other human-related activities. Reversing these trends will require improvement in harvesting practices and community forest management, the capture of greater value-added gains, and the development of commercial value for fuelwood products to encourage the management of the basic resource. These trends and issues are summarized in Table 2.

**Table 2.** Summary of trends and issues

Aspect of Production-to Consumption System	Present Trend	Future Trend
Ability to meet the needs of exploiters	Moderate	Low
Ability to meet the needs of suppliers	Moderate	Low
Ability to meet the needs of retailers	Moderate	Low
Ability to meet the needs of consumers	Moderate	Low
Marketing and transport infrastructure	Moderate	Better
Effect on the environment	Bad	Worse
Property right and ownership	Low	High
Transformation/processing	Moderate	Same
Exploitation techniques	Bad	Better
Conservation techniques	Low	High
Outside intervention	Moderate	Higher
State intervention	Neutral	Positive
External influence	Moderate	Higher
Quality of product	Moderate	Lower
Ecological sustainability	Low	Lower
Competitiveness with other fuels	Very low	Might change
Traditional and cultural impact	Neutral	Positive
Effect on economic development	Positive	Negative
Cost/benefit allocation (gender allocation)	Women disfavored	Might change
Economic value of the product	High	Higher

## Problems

The main problem brought about by the collection of fuelwood has been the destruction of forest resources. Research into the causes of environmental degradation show that excessive fuelwood collection has contributed to, and brought about, disruption of the ecosystem (Pelkey and Ali 1996; CEDC 1997). Measures being taken to correct this degradation include working to inform farmers of the importance of rational exploitation, of tree planting, and of the value of maintaining the existing trees on their farm plots.

A second problem associated with fuelwood collection occurred when children involved in fetching and selling wood became excited by their earnings and dropped out of school. Thirdly, this source of income is not sustainable, and it is possible to go for days without any sales. The market is easily saturated, as entry requires little in terms of capital investment and technical understanding, and many people were encouraged by the lack of need for

permits to exploit the fuelwood resource. The introduction of rational management of the fuelwood resource, including the issuance of permits and better management of the product, would help to stabilize markets, market values, and ensure a steady supply of fuelwood.

## **CONSERVATION AND DEVELOPMENT LESSONS OF CASE**

### **Jobs and employment**

The fuelwood sector employs many men, women, and children in both rural and urban areas, offering both temporary and permanent employment opportunities. It is important economically because it offers an immediate source of income to the exploiters. Delinquency is reduced through employment in this interesting and financially rewarding work in the many otherwise unemployed young men who form the majority of the commercial sector.

### **Capital generation, risk minimization and business and industry**

The exploiters generated social, physical and financial capital. Because of the income afforded, they were able to maintain minimum savings on which they could draw for emergencies or sudden need. However, the income afforded is not large, and the structure of the sector does not lead to increased choice and work opportunities, as the production-to-consumption supply chain is very short. No industrial, banking or lending institutions were developed as a result of this product's exploitation.

A side benefit to the crisis caused by the harvest of fuelwood was the influx of many NGOs and projects into the study area, which made other investments in the villages. They built houses, offices, trained villagers and contributed to their livelihoods in different ways. Through studies on the exploitation of fuelwood, measures were taken to remedy other serious problems faced and identified by the villagers. Finally, the fuelwood markets indirectly and directly increased the sales possibilities of other animal and farm products in the villages.

### **Capacity building**

Both formal and informal education was gained by involvement in the fuelwood sector. Informal education was obtained through interaction with buyers and other exploiters. Participants were exposed to and learned to speak other languages, developed better bargaining abilities and came to know more about the currency. Many immigrants (mostly Chadians and Arabs) have come to the main producing zones through this sector. Their involvement has brought new ideas into the villages and increased the level of social interaction of the villagers with other people. Some parents sponsored their children through wood sales, while others received training on tree planting and agricultural techniques from the conservation and development projects that have come to fight against environmental degradation.



## **Leisure, health and food and nutrition**

The living standards of the people have improved through involvement in the fuelwood sector, as it increases household income. This in turn enables the household to buy more and more nutritious food, better clothes, medications, and household supplies. Though neither extra health services nor relaxation spots were observed as a consequence of the fuelwood sector, it did contribute to existing ones. The fuelwood product has particular impact on the quality of food, as it aids in food preparation. The fact that all villagers have access to cheap and easily manipulated domestic fuel for heating food, cooking and carrying out other activities is very important.

## **Community facilities**

The housing conditions of the study area, in terms of living conditions, crowding (number of people per room), sanitation, upkeep and appearance, were not developed. Villagers had mostly traditional houses with at least two persons in a room, which in most cases served both as a kitchen and living area. Transportation services between the villages and Maroua consisted of old, dilapidated vehicles travelling on muddy, poorly maintained roads. Transportation within the villages was on foot, animal or bicycle. Most of the villages have neither electricity nor piped water; some villagers were obliged to travel more than 5 km to obtain water. The few public services existing in the villages were inadequate.

## **Forest management and exploitation patterns and modalities**

The management of the forest resource is difficult, because people do not feel ownership of the trees or the land and have no incentive to care about what happens to it in the future. Government and NGOs find it difficult to conserve forests and forest resources and are forced to put guards around some forests (such as Waza National Park) in order to meet their management and conservation objectives. In other cases, NGOs are called to build fences to protect forests from encroachment by farmers, as the forest is destroyed when a new farm is opened up. The lack of land tenure surely played a role in the fact that few farmers in the study area made an effort to maintain or plant trees on their farm plots—despite the encouragement from some projects that gave incentives to farmers who maintained or planted the highest numbers of trees on their plots (DPGT 1996).

Forest exploitation in the study area was mainly rudimentary, with no real effort at managing the various forest resources, as harvesters cut indiscriminately, without regard for the tree's age, size and location within the forest and little consideration for the future. Harvested trees were mostly used as fuelwood, though some were used for artisan and building purposes.

## **Ecological sustainability**

Considering the exploitation patterns and lack of rational management, there is no guarantee that the ecosystem will be maintained. What is left

are plants and animals resistant to the effects of the changes brought about by the widespread exploitation and which are not themselves desired for exploitation. This was in evidence in the study area in that the villagers complained about the gradual disappearance and scarcity of some animal and plant species. One way to improve the situation would be to encourage the establishment and exploitation of artificial forests while conserving the natural ones, but the feasibility of that proposal would depend on the active participation of the villagers.

The entire population of this area would suffer without the commercial value of fuelwood. It serves as an important source of income to village households, and it is often the only domestic source of fuel. It represents an important source of non-substitutable domestic energy to urban households as well. The urban poor and those who use fuelwood as the only source of domestic energy are vulnerable to changes in the supply and price of fuelwood, as changing to other fuel sources is expensive because it necessitates the purchase of associate appliances. Urban dwellers will suffer if problems associated with the increasing scarcity of this fuel source are not addressed (for example, increasing price, product scarcity, damaged ecosystems).

With regard to the degraded ecosystem, it is difficult to know if the forest would have been more or less degraded if it were not exploited for fuelwood, because it is possible that the alternative resource or income generating strategies would have been still more damaging to the forest resource. However, given the extent of forest disturbance and the growing demand for an increasingly scarce resource, the health of the ecosystem would be more secure in the absence of the harvest of fuelwood.

The development of the fuelwood sector is of interest to both village and urban populations, as both benefit from the cash income and unique product fuelwood provides. The formalization and development of the sector may actually lead to greater conservation of the forests, as people utilize various programs and legislation to secure rights to the forests and their resources, and then to exploit the forest resource more rationally. One way of developing this sector would be to monitor the harvesting, sale and use of fuelwood. Such a policy should also develop strategies to give this energy source a value competitive with other energy sources.

## **CONCLUSION AND RECOMMENDATIONS**

Fuelwood is not only an economic but also a social good indispensable to both rural and urban populations. It contributes to family income generation in the study area, and by extension in other parts of Cameroon. Despite, or because of, the importance of this product in the Maroua region, its harvest has resulted in serious environmental problems that were difficult to address at the village level. Live trees are still felled for fuelwood, despite the demonstrated negative consequences on the environment.

The chain of production and trade was short and simple, with few intermediaries. Nevertheless it involved the majority of the population of the study area because fuelwood sales were one of the few means of generating income available to them, aided by the constant demand for the product and,

to some extent, the tastes and preferences of the consumers. Retailers in urban centers employed workers for splitting, bundling and selling of the product in wood markets. Although there were no formal associations of wood marketers, the markets were well organized, and sellers knew each other by name and by the quantity of wood they traded.

The short marketing chain ended in large part with the urban households who are the main consumers of this product. Little transformation occurred between harvest and the final consumer. The only way in which value was added to the product was by splitting it into smaller pieces, which are most desired by consumers. The consumers were mainly price receivers and had very little say in the fixing of prices. The final sales prices were at least twice the farm gate prices in all cases. The difficulties posed by a decreasing resource base have driven suppliers ever farther into the countryside to buy wood from rural villagers, in spite of the attendant difficulties and costs associated with transport and storage of the fuelwood. The wood can be stored for three to five months, after which time insects begin to damage the product.

The government of Cameroon and others are working to maintain both the sustainability and availability of fuelwood as a resource. Their influence in this area has been quite positive, and the many successes and failures provide ample opportunity for 'lessons learned'. The failures have arisen mostly from egoistic behavior, financial shortcomings and lack of understanding by the village population as well as to some extent from poor identification and implementation of certain projects related to this issue. Despite these issues, much work and research is still being done to ensure the longevity of the fuelwood resource in a healthy natural environment.

The various agents involved in this production-to-consumption supply chain should be encouraged to form legal associations within their localities. Formalized associations could channel aid and assistance to their members to help develop the local fuelwood sector and, importantly, represent the members in communications among other associations and institutions involved with environmental protection or developmental actions and programs. Successful implementation of most strategies developed to fight environmental degradation will require some redistribution of land and clarification of both land ownership and property and usufruct rights. This task will be undertaken in collaboration with the statutory and traditional governments of the area.

## ENDNOTES

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