

Sclerocarya birrea (A. Rich) Hochst.

Marula

Namibian - South African case by Caroline Sullivan

Marula: A tree for everyone!

Fruit, juice, beer, jam, flavourings, medicinals, shade, caterpillars, handicrafts, fuelwood and more ... all from the marula tree! This versatile member of the mango family grows on open savanna grasslands* across southern Africa, in Namibia and South Africa (and also, Botswana, Swaziland, Mozambique and Zimbabwe). The marula tree (*Sclerocarya birrea*) often towers some 15 m above the surrounding landscape, a beacon of shade in a hot, dry land. It bears huge amounts of juicy fruits, providing a vital source of nutrients for many species, from people right down to the insects and fungi that consume whatever remains uncollected on the ground.

A multi-purpose tree

Throughout the year the leafy branches of marula trees offer respite from the relentless sun. When the tree is fruiting, a special type of fermented beer is produced, signalling a period of community celebration. These festivities provide an opportunity to build friendships or form important social networks, and even draw home distant family members, cementing crucial urban-rural bonds. Bags of marula kernels are exchanged as gifts of friendship,

a single nut may be tied around the waist of a young child to ward off disease and misfortune, and a rare, misshapen nut may be used as one of a number of diviners' dice.

While the marula tree has multiple uses, the main ones relate to its fruit. These round yellow, plum-like fruits hang in abundance from every branch. As they mature the fruits fall to the ground, where they are eaten by wildlife and livestock or are collected by people. Mainly women and children gather the harvest, for eating or brewing into beer - a product greatly appreciated by the men and shared between households.

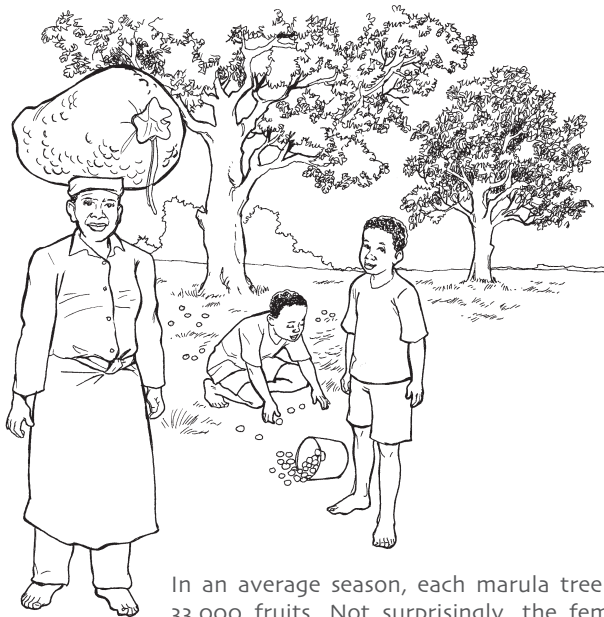
Coinciding with the start of the school year, the trade of marula beer provides important family income (US\$ 30-80 per season). This is a significant sum in a region where the minimum wage is US\$ 1 per day. In some areas however, the selling of beer is considered taboo.

Although less common, the production of marula jams and juices is on the rise, generating useful cash income. Compared to orange juice, marula juice contains around four times the amount of vitamin C!



The use of marula for flavouring yoghurts, chocolates, biscuits and alcoholic liqueurs is also becoming more widespread. Inside each fruit is a nut containing 2-4 small, nutritious kernels - and even these are useful! They are eaten as a snack or mixed with wild greens, or alternatively, are crushed to produce a cooking oil. Due to its special moisturising properties, this oil is also used to create marula skin care products, which are sold in local markets. On a larger scale, an international natural skin care and cosmetics company called The Body Shop is purchasing co-operative production of the oil in Namibia, for use in a new line of lipsticks. It is hoped that such new developments will foster an international market for the oil, with increased benefits for all.

The bark and wood from the marula tree also have a number of uses. For example, traditional healers use the bark for medicinal purposes. Sometimes on old tree branches, parasitic mistletoe* causes special outgrowths to sprout and these 'woodroses' are used as decorative ornaments or are sold to tourists. The wood itself provides a major source of raw material for woodcarving, for domestic implements and the tourism trade, while the deadwood and fallen branches are used for fuelwood. If you look closely at the marula leaves, you are likely to find caterpillars from several emperor moth species. These provide an important source of protein for local people, who regard them as a delicacy.



In an average season, each marula tree produces 3,000-33,000 fruits. Not surprisingly, the female trees, which bear the fruit, have become symbols of fertility and plenty.

Harvesting and processing the fruits and seeds

As the marula fruits fall when they are ready for consumption, harvesting is easy and accessible - although customary restrictions on certain trees can place some limits on harvesting. The fruit's accessibility means children can eat it on their way to school, and older women can earn a little money through its collection and sale. Fortunately, with this ease of harvesting, there is no desire to cut the tree down - saving them from the sad fate that faces other fruiting trees in many parts of the world.



Women remove the leathery marula skin with a fork (formerly a cow horn) and squeeze the juice into a basin, putting the nuts aside for later extraction of the kernels. To make beer, the juice is then fermented.



Extracting the oil is difficult as the shells are hard and each kernel only produces a small amount of oil. Traditionally, nuts were opened by cracking them against a particularly hard stone. In areas where such objects are not easily found, 'marula cutting stones' have been passed on from one generation to another, like heirlooms.

Marketing issues

As globalisation takes hold, marula users become subject to the same pressures of market forces that influence us all. Unfortunately, this means that pressure on the use of the 'wild' resource may become too great or entrepreneurs may take advantage of trusting communities by not giving them a fair price. If marula products become more popular, the demand for raw supplies will increase, providing potential income for people in communities with access to these trees.

However, it is important that those involved in the collection and trade are informed about how this tree can be used in an ecologically sustainable* way. The economic and social aspects regarding its various other uses also need to be considered. To maintain all these local values, respect for traditional uses is vital, as is the strengthening of land tenure rights and systems for managing the marula resource. In the past, the traditional values and uses have too often been forgotten in resource commercialisation decisions. Perhaps this trend can be reversed through highlighting all of the values of the marula tree, not just the monetary ones. Only by developing effective policies for equitable and sustainable use, will we continue to see the great marula tree as a familiar feature in the landscape of southern Africa, providing food security, income streams and other benefits to local communities and future generations.



Garcinia kola Heckel

Bitter cola

Nigerian case by Atilade Akanmu Adebisi

Bitter cola: The African wonder nut

Bitter cola nuts come from *Garcinia kola* trees, which grow in coastal rainforests in the south, west and eastern parts of Nigeria. Traditionally, these nuts were chewed as a masticatory substance (to stimulate the flow of saliva) but today they are widely consumed as a snack. They contain large amounts of caffeine and other stimulants (like theobromine, kolatin and glucose) and are also believed to be an aphrodisiac. Unlike other cola nuts (*Cola nitida*, *C. acuminata*), bitter cola is thought to clean the digestive system, without side effects such as abdominal problems, even when a lot of nuts are eaten.

Bitter cola is culturally very important for the Yoruba and Igbo tribes and for many other people living in the sub-Saharan region. For centuries, the nuts have been an important part of their lives - from birth to death. They are used in traditional ceremonies, marking special events like births, marriages and the conferring of chieftaincy. A cola nut tree may be planted when a baby is born, with the child becoming its lifelong owner. In proposals of marriage, young men offer cola nuts to the father of the bride, and an exchange of cola nuts is essential in many business dealings as well.

Multiple uses

Bitter cola nuts are extracted from the fruit of *Garcinia kola* trees. In herbal medicine, the fruit pulp is used for the treatment of jaundice, or high fever, while the bark of the tree is used in medicinal preparations to help heal various ailments. The nuts are also dried, ground and mixed with honey to make a traditional cough mixture. In the last 3-4 years, ground nuts have also been used as an industrial bittering agent in some Nigerian breweries. The hard wood of bitter cola trees is not often used for timber or firewood, but the stems, branches and roots are commonly used in the production of chew sticks*.



When a Yoruba baby is old enough to be carried on its mother's back, the parents arrange the naming ceremony. Ceremonial foods, such as bitter cola nuts, are introduced to the baby with prayers that the child will not use them against anyone or have them used against him.

Garcinia kola grows in humid rainforests near the coast, as a medium sized tree that can tolerate shade. Until the early 1960s, these trees were found in dense populations in most of the forest reserves set aside by the then regional governments in south-eastern and south-western Nigeria. However, deforestation in recent decades has dramatically reduced the number of these trees growing wild. Over the last decade however, *Garcinia kola* trees have been increasingly cultivated in secondary forests*, as a component tree in plantations, or in agroforestry* systems. The trees can be planted from seed and bear fruit after 10-12 years. At its peak, a mature tree yields on average, almost 500 fruits and 1700 nuts each year.

In Nigeria, almost 70 per cent of bitter cola is produced from natural or secondary forests in government reserves. The rest comes from trees growing in cocoa/cola combined farming plots in south-western Nigeria, and from oil-palm/cassava farms and home gardens in south-eastern Nigeria.

Extracting and marketing the nuts

The fruit of *Garcinia kola* is collected after falling to the ground and is kept until its orange-coloured, velvety skin softens. This may take 5-7 days. Extracting the nuts is a simple household affair that is not very labour intensive. The harvest is threshed to release each fruit's 3-4 kernels. These are referred to as bitter cola nuts as soon as the fruit pulp is thoroughly washed off. At this point, the nuts are ready for eating fresh or can be air-dried and stored in a cool, dry place. Both the fresh and dried nuts are appreciated by rural and urban populations and demand for them cuts across the three major ethnic tribes in Nigeria (Yoruba, Hausa and Igbo).

As well as being sold in local and nearby city markets, the nuts are also transported in large quantities to the far north of the country where *Garcinia kola* trees do not grow. They also find their way into roadside kiosks in major cities and towns in the northern part of the West African sub-region, including Cameroon. The trade in bitter cola is worth an estimated US\$ 50,000 a year.



Whenever bulk buyers do not purchase the bitter cola nuts directly from collectors, an appointed village trader takes the harvest to the closest market. At the farm gate, 1 kg of bitter cola fetches around US\$ 0.80, while in the local market, it sells for US\$ 1.20, in a marketing scene dominated by women.

Processing bitter cola nuts takes time, but entails little or no economic cost to the farmers involved in this activity. The resulting income helps poor rural families pay for school fees and materials or household goods. Bitter cola's increasing commercial value means it is important for farmers to cultivate *Garcinia kola* trees rather than rely on the dwindling wild supplies.

The nuts are more profitable than any other forest resource in Nigeria. In one season, a family can collect an average of three baskets of bitter cola, weighing 25 kg. This generates about US\$ 24 in household income. The ability to store the nuts and use them fresh or dried makes this a wonderfully versatile and useful product.

Trends

Bitter cola has become an increasingly important and valuable commercial commodity for the rural poor of Nigeria, but deforestation and the conversion of forests for development and plantations has reduced the number of wild bitter cola trees. In the last decade, attempts to grow more trees have proven fruitful. People have learned how to raise and manage the trees, and due to the diversity of uses for this tree and the cultural affinity that people have with bitter cola nuts, individuals and organisations alike are now actively planting *Garcinia kola*. The trees are being grown from seed or wild seedlings are being transplanted from the forest, but there are also trials of alternative methods underway, aimed at reducing the time it takes for the trees to mature and bear fruit.



Bulk buyers wrap 25 kg of bitter cola nuts in leaves and store them in baskets lined with jute cloth. These are taken to the larger city markets where 1 kg sells for around US\$ 2. Retailers purchase the nuts in bulk and sort them into 1 kg packages - selling them from roadsides or kiosks for US\$ 3.40 per kg.



Ricinodendron heudelotii (Baill.) Pierre ex Heckel

Dried kernels

Cameroonian case by Danielle Lema Ngono and Ousseynou Ndoye#

Njansang and bush mango: Cameroonian seeds in national and international markets

For centuries, Cameroonian families living in both villages and cities have enjoyed dried kernels from 'njansang' and 'bush mango' fruits - particularly for flavouring and thickening soups, stews and sauces. Today, these kernels are imported into Europe as well, largely for the benefit of the African expatriate populations that now live there. These popular 'oilseeds' as they are known, represent an important source of income for the rural families who collect and process them, especially in the wet forest belt of Cameroon.



Women sell the bush mango kernels in heaps or in the form of a solidified paste.

Njansang

Kernels from the dried seeds of *Ricinodendron heudelotii*, locally known as njansang, are amongst the most favoured forest products consumed and sold in local markets. These energy-rich kernels, which contain high levels of fat, protein and calcium, can be substituted for groundnuts or used in cooking, either ground or in a paste. The fruits are generally harvested (mainly from central Cameroon) from July to September, appearing earlier or later in different regions. The fleshy fruits, which change from yellowy-green to black on ripening, are not eaten by people although they are enjoyed by some animals. Each fruit contains 2-3 reddy-brown or black seeds, with small white kernels within.

Bush mango

Bush mango kernels, from a wild species of mango, are another popular forest product in Cameroon. The fruits, which turn from green to yellow on ripening, are harvested from two related tree species. *Irvingia gabonensis* bears fruit from June to August, while *I. wombulu* fruits from January to March. The local name for these trees is 'andok', and the fruits and kernels, both of which are edible, are known as 'ndok'. The seeds contain single kernels, which change from white to yellow when dried. Their colour and odour are the most appealing characteristics. In the



south-west, the fresh kernels still covered with their stones are preferred because of the flavour they impart when cooking sauces. But in the rest of the country, people prefer the odour of the dried kernels.

Harvesting the bounty

Both njansang and bush mango trees sometimes reach 40 m in height and 1 m in diameter. They grow in the humid forest zone of Cameroon but are increasingly being cultivated as well, in cocoa plantations, home gardens and on farms. When grown from seed, they take around 10 years to start producing fruit. The wood of these trees can be used as a building material, while the roots, leaves and bark are sometimes gathered for medicinal purposes.

Harvesting the fruits for their kernels however, represents the trees' main usage. Fortunately, this harvesting is non-destructive. Women and children collect large quantities of the fruits and prepare the seeds for processing. With access to the necessary capital and transport however, it is the men who control the wholesale marketing of the njansang kernels. For bush mango, it is largely the women who market and sell the kernels in urban and rural markets, although men carry out much of the production.

Harvesting and processing njansang seeds

The labour intensive production of njansang kernels occurs particularly around the main growing area - Cameroon's Central province. First, the fruit is collected and then covered with foliage to accelerate the fermentation of the pulp. After approximately one week, the stones are washed and separated from the softened fruit by hand. The stones are then boiled over a low fire for at least 24 hours to crack the seed coats.

The kernels are extracted using simple tools like knives or flattened nails, before being dried in the sun or on a tray over a fire - a process which turns them a yellowy-brown colour and ensures that they develop the flavour and scent buyers favour. The highest quantities of njansang kernels are traded in Yaoundé's Mfoundi market, and Douala's New-Bell market - and from these locations, the product finds its way to many other urban and rural markets.



Boiling the njansang seeds softens and cracks open the seed coats, making it easier to extract the kernels.



Bush mango and njansang kernels are sold in specialty shops and grocers in Europe.

Extracting bush mango kernels

Bush mango processing, like that of njansang, is a labour intensive, local activity that only requires the use of basic tools. The fruits are crushed and the stones are extracted with the assistance of a machete or knife. The stones are then soaked in water to facilitate the removal of their tough fibrous coating. Alternatively, the ripe fruits may be juiced, sometimes commercially, producing a drink that children in particular enjoy. When all the pulp has been removed, the remaining stones are dried - another technique that assists with the removal of the fibrous coating.

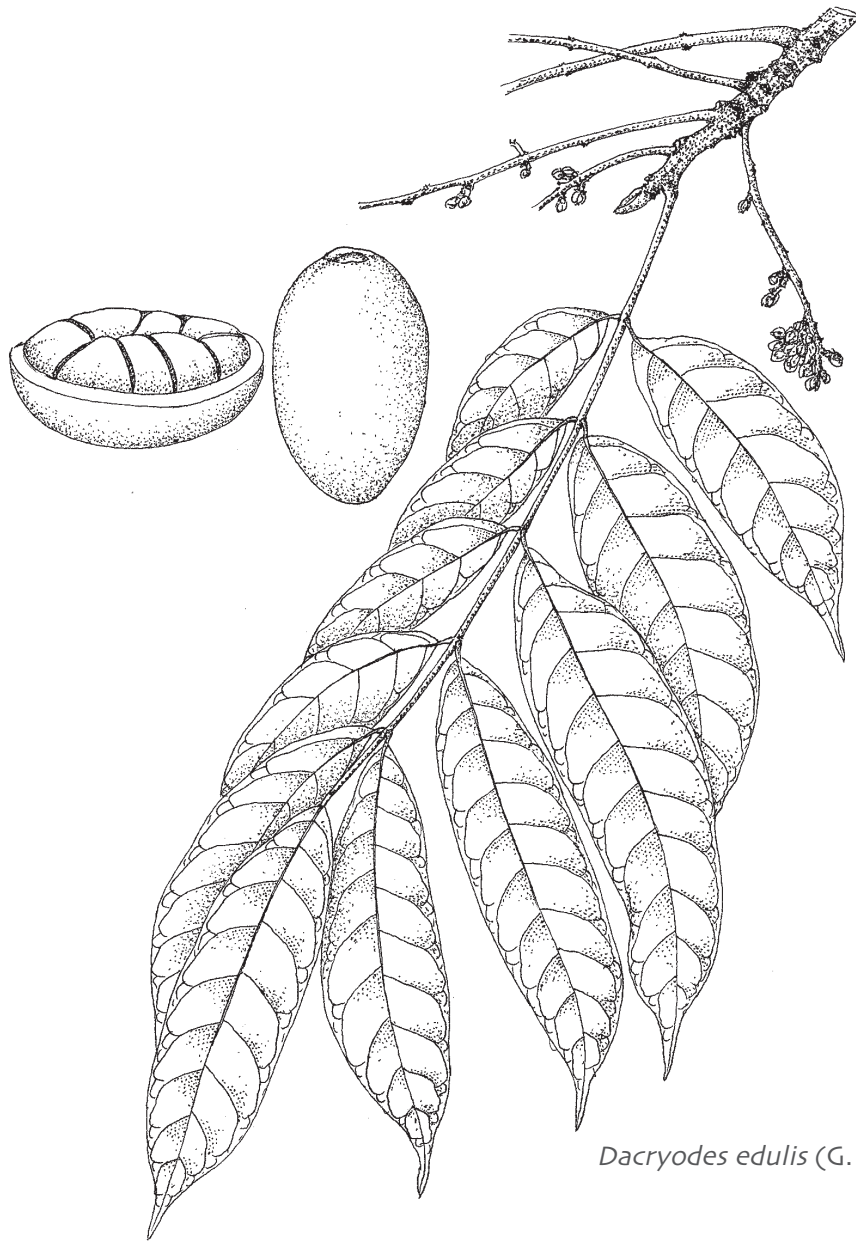
The dried seeds are much easier to handle than the sticky fresh ones and can be preserved for quite a long time or kept in the form of a seed cake or paste. Bush mango production varies between cultural areas and is most intensive in the South, South-West and Central provinces. The main trading centres and distribution points are the Ebolowa and Mfoundi markets.

Pricing

The harvester/processors generally receive almost two thirds of the final consumer price. However, local market prices fluctuate, depending upon factors like kernel quality, the season (and level of scarcity or abundance), and the transport distance from the main production areas. For example, the price per kg of bush mango kernels was US\$ 1.40 in 1997 but in 1998 and 1999, during a period of increased scarcity, the price rose to US\$ 2.20. The commercial value of njansang kernels has also fluctuated. At the Mfoundi market it altered a little, from US\$ 31,720 in 1997 to US\$ 31,180 in 1998. During the same timespan at the New-Bell market, the main market in Cameroon's administrative province, where most of the marketing and also, reselling (to domestic and export traders) takes place, the total value increased from US\$ 248,700 to US\$ 464,235.

In addition to the domestic trade, the kernels are sold to a number of neighbouring countries. For example, the trade of bush mango kernels to Gabon, Equatorial Guinea, Nigeria and the Central African Republic was valued at US\$ 260,000 per annum in 1997. Both bush mango and njansang kernels are also exported to Europe, where they are sold in specialty shops and grocers, largely to immigrants from West and Central Africa. Around US\$ 1 buys 50 gm of bush mango kernels or 100 gm of njansang kernels - with much of the proceeds going towards sustaining the Cameroonian families who harvest, process and trade these popular products.

The authors would like to acknowledge the assistance of Abdon Awono (CIFOR research assistant) in the compilation of this case.



Dacryodes edulis (G. Don) H.J. Lam

Bush plum

Nigerian case by Hassan G. Adewusi

Bush plum: The all-purpose family tree

The bush plum of West Africa (*Dacryodes edulis*) has almost as many uses as it has shapes, sizes and names. This indigenous* rainforest tree supplies villagers with food for their tables, wood for making tools, cooking oil, livestock feed, resin to seal gourds and mend earthenware, and traditional medicines. The species' multiple and varied uses make it one of the most highly valued wild plants in West Africa.

Bush plum trees grow wild in humid, lowland tropical rainforests. These forests spread from south-western Nigeria down through Cameroon, Gabon, the Congo Basin and as far south as Angola and Zambia. The species has been gradually cultivated and commercialised over the past 60 years, and bush plum trees are now found in garden plots and farms far beyond their natural habitat.



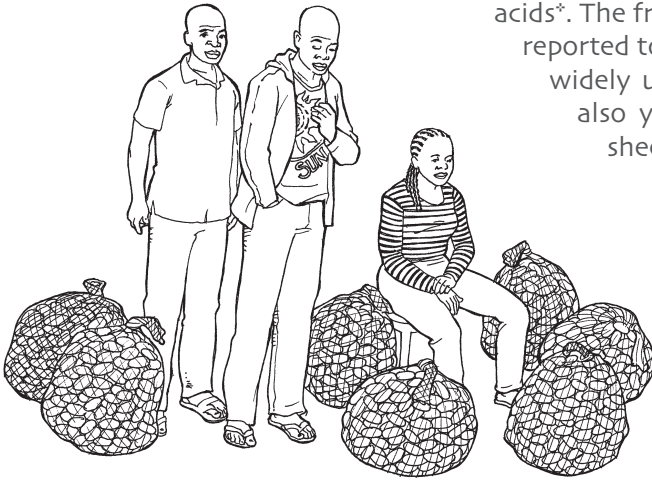
Fruits are gradually harvested as they ripen. None are left by the end of the season.

Farmers commonly have three to four semi-domesticated* trees growing on their average-sized, one-hectare farms. Their patient selection and cultivation of desirable traits has created seven variations of this fruit, differing in shape, colour, size, taste, and in the thickness of the 'mesocarp' or fleshy pulp. Farmers have also succeeded in 'forcing' their trees to produce much earlier. In the wild, bush plums begin to fruit after 10-15 years. On farms, pruned and cultivated trees bear fruit within three years, while unpruned trees start reproducing after five years.

A multi-purpose tree

Bush plum trees are a nutritious source of food. Their fruit - which is known by various other names, including African plum, bush pear, native pear, safou or safoutier (in French-speaking African nations) - is eaten as a supplement to the main diet or as a snack. The fresh pulp is quite oily and has a pear-like flavour. It can be eaten raw (once thoroughly washed), or after being steamed, or roasted and softened in hot ash. It is often eaten between meals, particularly with boiled or roasted maize during the 'hungry season', when most staples such as yam, cocoyam, and rice are not yet mature.





The fruit is generally available in markets between May and November.

The fruit pulp is rich in protein and has a good balance of amino acids*. The fruit itself yields about 48 per cent edible oil, which is reported to be relatively stable, and compares favourably with widely used vegetable oils. The 'cotyledon' or seed sprout, also yields oil, as do the kernels - which can be fed to sheep and goats after the oil has been extracted.

Resin from the bark of the tree is used to seal vessels like bowls made from 'calabashes' or gourds, and to repair earthenware. The timber is good for tool handles, axe shafts, mortars and carpentry, while the leaves, bark, roots and other parts of the tree are used to treat a variety of ailments. Cultural uses are also widespread. In certain parts of south-eastern Nigeria, for example, bush plum trees are a sign of either hospitality or hostility to visitors, while the kernels are used to foretell the future.

A family affair

In the typical rural household of seven people, about half the family members are involved in harvesting bush plums and making various products from the tree. About a third of the family, mainly the women and children, are involved in marketing the goods.

The bush plum tree's primary economic value lies in the sale of its fruit. Mature trees yield between 1500 and 10 000 fruits a year, generating US\$ 75-150 in cash income. In Nigeria, the trade extends through the major cities, and into distant semi-arid and arid areas thousands of kilometres away from where the trees are grown.

The fruit is packed into 25 kg baskets and transported through the cool of the night for early morning delivery in cities. During the peak production period, baskets sell for between US\$ 0.95-1.50 at the farm gate, and are resold in cities for US\$ 1.00-1.70.

The future

Bush plum trees have been commercially important locally and nationally for many years, and international markets are currently expanding. The trade appears sustainable because harvesting methods do not harm the tree itself, and few trees in the wild are exploited. More than 90 per cent of bush plum products are made from trees in home gardens and agroforestry* systems. Bush plums provide a long-term source of income as fruit production levels only begin to decline after 60 years.



But there is still plenty of room for improvement. Some researchers have noted a need to study the biology and the commercial potential of *Dacryodes edulis*. Despite being grown on farms for many years, the species remains largely unimproved and semi-domesticated, which means there is scope to greatly boost production and quality.

Potential improvements include bigger, small-seeded, creamier fruits; thicker flesh; and shorter, faster maturing trees. Encouraging the cultivation and commercialisation of *D. edulis* will enhance the selection of elite specimens from the highly variable wild stocks. This will in turn, promote the adoption and practice of conservation strategies for bush plum trees in the wild. Conservation of the species and improvement of its fruit will help boost international trade. Additional export products from these trees could include cooking oil, margarine, soap, cosmetics and animal feed.

What is mostly needed, however, are better organised production and marketing systems. The road network within the production area is in a serious state of disrepair. Easy passage is only partially possible during the short dry period of the year, and this is affecting the producers' capacity to get bush plums to market. This valuable fruit will continue to benefit all of the people involved nationally in its production, transportation and trade. With further improvements in production and marketing future social and economic gains may be possible for rural communities.



Bush plums are exported from Cameroon and Central Africa, to Europe. In Paris, France, where Cameroonians can buy products from their home country and other African nations, 1 kg of fresh *Dacryodes edulis* fruit costs 10-13 Euro (about US\$ 14-15).





Vitellaria paradoxa C.F. Gaertner

Shea butter

Benin case by Kathrin Schreckenber

Shea butter: From cooking fat to cosmetics and chocolates

When there is no bottled sunflower or maize oil for cooking, what do people do?

In northern Benin, as in most of the southern Sahel and Sudan zones of Africa, shea butter is the most common and affordable type of cooking fat. In non-pastoral areas* it is sometimes the only type available, with a typical family consuming around 150 gm per day. Made from dried shea fruit kernels, shea butter is also used in traditional medicine and soap making, while the fruit itself makes a tasty and nutritious snack.

Internationally, shea butter is used as a cocoa butter equivalent. For example, in chocolate making its high melting point results in increased shine and hardness at room temperature. In addition to food applications, a new market has also recently opened up - the production of 'natural' cosmetics. Shea butter's hydrating, protecting and softening properties are making it a valuable ingredient in skin care creams and shampoos.



Family holdings throughout the Sahel and Sudan region are often surrounded by agricultural fields, containing about 25 shea trees per hectare - far more than you would find growing in natural vegetation.

Shea butter has been traded in Africa since the fourteenth century. In the early twentieth century, it was exported to Europe for margarine and candle production and today, the European export market is worth around US\$ 13 million per year. The collection and trade of shea products is largely the domain of women, with local people describing shea as a 'gift from God to help women survive'. Its French name, 'karité', comes from the Dioula language, meaning 'tree of life'.

Shea trees on agricultural land

When farmers clear new fields, they generally retain their mature shea trees. These medium sized trees grow best in open sunlight and have a thick bark protecting them against the frequent savanna grassland* fires. Regenerating easily from seed, shea trees bear fruit after about 15 years and can continue fruiting for around 200

years. Yields are generally good once every 3 years but this does vary between trees. A single tree may produce around 20 kg of fruit (or 5 kg of dried kernels).

Harvesting and processing shea butter

Women and children collect fruits off the ground from April to August, usually when going to and from the fields. The rotting fruit flesh is discarded or fed to livestock and the nuts are dried in the sun or in tall ovens before being gently pounded to remove their shells. After being sun dried for a few days, the kernels can then be stored for up to 2 years.

Making the butter requires large amounts of fuelwood and water. The kernels are coarsely pounded and roasted before being ground into a smooth brown paste and mixed with water to separate out the fat. Washing, boiling and decanting removes impurities and the resultant butter can then be stored in a cool place for several months. The transformation rate of local processing is very efficient and produces 1 kg of butter from 3 kg of dried kernels.

Most processing for the international food industry occurs in European factories, using modern technology to obtain the butter. This refining process stabilises the butter but also reduces some of the qualities valued for cosmetics. So, some cosmetics companies source their butter directly from African processors.



If time allows, women undertake special half day trips to gather shea fruits, returning with headloads of over 40 kg.



To produce butter pats for sale, warm creamy butter is scooped into a small calabash* and then allowed to harden in cold water.

To market

A few women are considered 'specialists' in making shea butter, producing large quantities for sale, but most retain only enough kernels to make butter for home consumption, selling the remainder. In an average year, women may collect 160-300 kg of dried kernels and depending on their financial needs, may sell the entire collection or small amounts at the market to cover weekly food costs. Prices vary from US\$ 0.06-0.20 per kg but can reach US\$ 0.36 per kg if the cocoa harvest is poor.

Depending on the price and the amounts collected and also, retained for home use, women can earn US\$ 7-36 from the sale of kernels. This can provide an important source of 'lump-sum' income, for example, for buying agricultural stocks or clothes.

Between August and November, agents visit local markets or villages to purchase kernels. Some are processed into butter in West African factories but most are exported to Europe and Japan for processing, later reappearing as cosmetic ingredients or as 'vegetable fats' in a variety of food products.

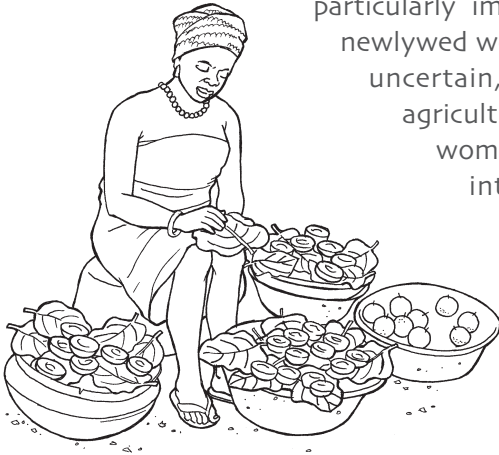
Trends

Shea has provided local people in the Sahel region with a long and relatively stable history of moderate income generation. Market stability has been assured largely because the product can either be consumed and traded locally or internationally and its multiple uses have protected it from the threat of substitution. Involvement in shea collection is open to all women and the benefits are fairly evenly distributed along the marketing chain. Nevertheless, certain trends are placing longer term pressure on the resource. Changes in agricultural practices (e.g. the introduction of cotton monocultures*) are promoting the removal of shea and other native trees. Local butter consumption is also changing. Shea butter is still the cheapest cooking fat but some ethnic groups are moving to palm or groundnut oils.



Women buy shea kernels for processing into butter.

Since harvesting and processing don't require capital investment, shea kernels are particularly important for those with few other options, including elderly or newlywed women. But as collection is time consuming and yields and prices are uncertain, more lucrative activities are sought. The combination of agricultural pressures, declining butter consumption and the preference of women for alternative activities, means the future of shea will depend on international (and to some extent domestic) demand. This is influenced in part, by cocoa butter prices, the proportion of shea butter allowed in chocolates (currently only 5 per cent) and increasingly, the cosmetic industry's requirements for kernels or locally produced butter.



Butter sellers typically transform 12 kg of dried kernels per week, into 4 kg of butter. Kernel prices vary three-fold over the season but profits remain steady at around US\$ 0.70 per week, through retaining a standard butter price but varying the size.



Prunus africana (Hook. f.) Kalkman

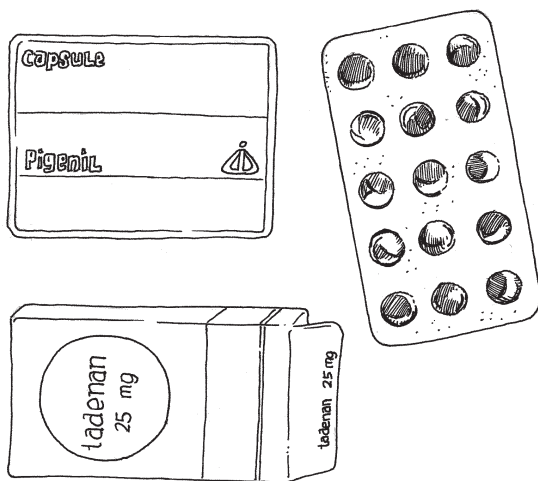
Prunus medicinal bark

Cameroonian case by Nouhou Ndam

Prunus africana: A traditional medicine finds international fame

Prunus africana, locally known and traded as 'pygeum', is a medium sized evergreen* tree with multiple uses, ranging from local to global. *Prunus* leaves and bark have been used in traditional remedies for centuries and they continue to play an important medicinal role today. Rural people in Cameroon and other African countries where these trees grow, also use the strong, hard wood to make items like axe handles and poles for building construction, or as a source of firewood. The pygeum fruits are eaten by birds and insects, and sometimes humans as well, although they are believed to contain some toxic compounds.

In traditional medicine leaf infusions are consumed to improve appetite or are used as an inhalant to remedy fever, while the fresh leaves can be used to dress wounds. Various bark preparations treat a range of ailments - including malaria, stomach-aches, urinary problems, sexually transmitted diseases, chest pains and heartburn. Bark concoctions are also used as a purgative for cattle.



Prunus africana bark is processed into non-crystalline and purified crystalline extracts, the active ingredients in the medical treatment of prostate disorders. An estimated 200 kg of fresh bark yields around 1 kg of extract.

In the late 1960s, it was discovered that *Prunus africana* also had potential in modern medicine. In recent decades, active ingredients from the bark have been utilised around the world to treat millions of older men suffering from inflammation of the prostate, a disorder that leads to urination difficulties.

Prunus trees in danger

Prunus africana grows to 25 m in height in mountainous forest regions in 22 countries, mostly on the eastern side of the African continent. Its range extends from eastern Africa westward towards central Africa, with a number of separate populations also appearing in West African countries like Cameroon and Nigeria, and in Madagascar as well.

A number of factors have adversely affected *Prunus africana* stocks. In Cameroon, entire trees are sometimes cut down before the bark is removed, or the bark may be



In Cameroon, a harvester collecting 30 kg of bark per day can earn an average of US\$ 0.40–1.00 per kg. This price can increase to around \$US 1–2 per kg if the middleman is cut out. For harvesters living in Mount Cameroon, bark collection accounts for about 70 per cent of their total annual income.

completely peeled off standing trees. Either way, trees harvested in such a manner tend to die. Another major threat is the widespread clearance of montane forest* for farming, in malaria-free highlands. With the decline of world market prices for cocoa and coffee, large areas of forest are being cut down to create more crop farms to compensate for lost revenues.

Amidst concerns for the future of this species, the international community included *Prunus africana* in the Convention on International Trade in Endangered Species (CITES*). This means exports now need to be monitored. Cameroon was the major exporter of *Prunus* bark throughout the 1980s and 90s, accounting for an average 1800 tonnes per year. However, this has taken place without any assessment of standing stock or sustainable harvesting* practices, and the effect on *Prunus africana* populations has been devastating, particularly in north-west Cameroon.

Salvaging the situation

Given the unrestrained depletion of natural stocks, the Cameroonian government is currently reviewing harvesting practices and the need for conservation measures. It is also supporting initiatives to determine exploitation quotas, explore the prospect of planting to boost supplies, and undertake an education campaign. However, the rate of progress has been criticised and it appears too late for exploitation quotas in some areas, given the already high levels of over-exploitation. Although in a few places, like Mount Cameroon, international development or commercial projects are focusing on assessing sustainable harvest levels and methods.

A number of techniques have been identified, including taking bark only from mature trees, removing the bark in patches, and not re-harvesting for a period of 4–5 years to allow for regrowth. The bark is harvested with cutlasses* and stakes and then tied into bundles for carrying home. Dirt and debris are removed and the bark is dried in the sun before being sold to traders or directly to factories for processing. Sustainable practices will have the best outcomes in areas where there are adequate supplies, harvesting and access are secure, and incentives exist to encourage harvesters to better manage *Prunus* stocks.



Bark harvesting is hard work, requiring collectors to climb *Prunus* trees and carry 30-70 kg loads of bark through mountainous forest. Hence, this activity is most suitable for strong, young men.

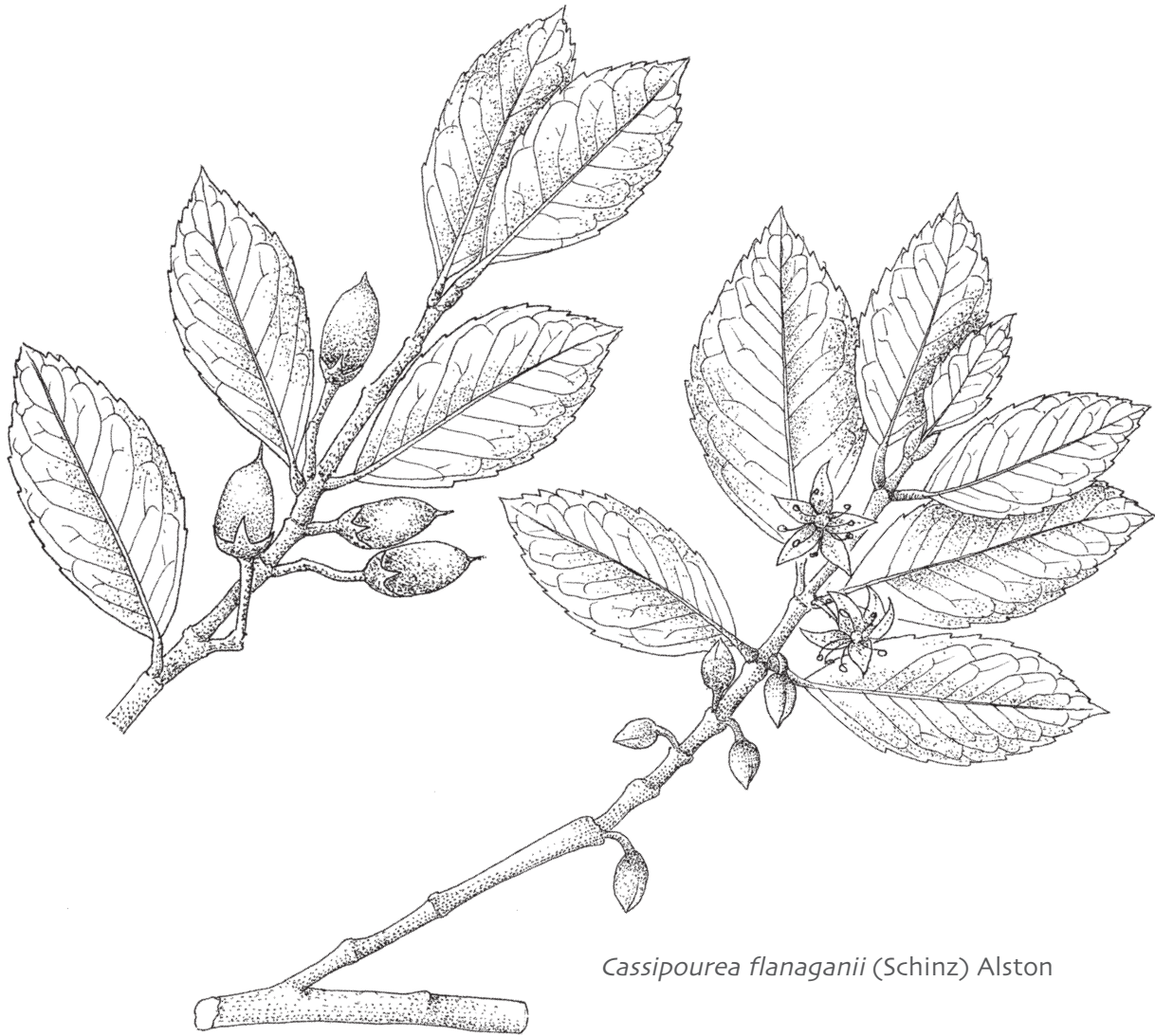
The future of the *Prunus* trade and trees

In addition to its traditional local uses, *Prunus africana* generates a lot of money. Worldwide, its retail value is in the order of US\$ 220 million per year, although only about 1 per cent of profits reach the rural communities where it is harvested. Nevertheless, sufficient income is generated to make bark harvesting a worthwhile activity for local people. Looking to the future, thousands of small scale farmers have also commenced growing this tree on their land.

To date, factors such as the State's failure to set sustainable quota levels and control exploitation have exacerbated the over-harvesting of this species, particularly in places where corruption levels are high, or where there is a "free for all" harvest. If the management of *Prunus africana* is to become more sustainable, the efforts of many people will be required - including authorities, local communities, traders, processors and consumers. Constructive actions on the part of the government could include simplifying the acquisition of special permits by

groups committed to sustainable management; clarifying the ownership of planted stands and the harvesting rights of owners; and determining quota allocations and other management guidelines for both wild and cultivated *Prunus* stocks.

Rural communities could demonstrate their commitment to improving local management by controlling illegal exploitation within the framework of local unions, avoiding deals with middlemen, and enhancing *Prunus* cultivation in agroforestry* systems. Harvesters and traders should comply with the provisions of their exploitation permits and licenses. For instance, ensuring that extracted wild stocks are compensated for through regeneration measures, according to government requirements. Also, pharmaceutical companies should provide source countries with a fairer share of benefits from the *Prunus* bark trade. With market demand likely to increase, such collaborative efforts by all stakeholders will be required to ensure the continuous availability of *Prunus* bark - not only to meet cash needs, but also longer term family and health care needs.



Cassipourea flavagana (Schinz) Alston

UmMemezi cosmetic bark

South African case by Michelle Cocks and Tony Dold

UmMemezi bark: Cosmetic use threatens native tree

"*Ukumemeza!*" In the Xhosa language of South Africa, it means "to call aloud" or "to attract attention". This expression also lends its meaning to a small forest tree and the popular skin cosmetic made from its powdered bark. The endangered UmMemezi tree grows wild in a small area of South Africa's Eastern Cape Province, where poor village women in particular, harvest its bark to supply a growing national market. Young Xhosa women mix the powdered bark with a little water to make a pale, reddish brown paste, which they apply to their faces to conceal blemishes, improve their complexion and lighten their skin.

The quest for beauty

Xhosa people consider a lighter skin tone to be more attractive and have used various products as lightening agents. The desirability of lighter skin was reinforced during the years of apartheid* in South Africa, when dark skin was linked to racial inferiority and lighter skin tones often made it easier to find favour. This desire for lighter skin has not diminished in recent times and various cosmetics, both natural and synthetic, are still used today.

Although Xhosa women have made cosmetics from grass roots, fungi and even clay for centuries, the use of UmMemezi was only documented for the first time in the mid-1970s. Its popularity increased dramatically after 1990, when new laws restricted mercury-based, commercial lightening products, which could cause serious damage to the skin. The growing trade in traditional preparations based on plants such as UmMemezi (*Cassipourea flanaganii*) and a closely related species (*C. gerrardii*), has seen the bark become available in herbal street markets and 'amayeza' stores (chemists) throughout South Africa. However, this desire to be light-skinned is posing a threat to these species, as over-harvesting is occurring to supply the urban demand.



Women use the powdered UmMemezi bark as a skin cosmetic to improve their complexion and lighten their skin.

Collectors and traders

In the Eastern Cape, bark harvesters, mainly women, regularly collect UmMemezi bark and other plant materials to sell in the herbal markets of nearby towns and cities. Harvesting takes place mainly on the weekends or early on weekday mornings. The work is quite strenuous and older children often assist their mothers. Together they remove the bark from the trees with an axe, taking it home to scrape and remove debris such as lichen. The bark is then left to dry in the sun for two days before being cut into small pieces of about 15 x 5 cm. Hardly any transformation takes place from raw material to end product and no further processing or packaging is required.

UmMemezi is bought directly from the collector-street traders and is resold at much higher prices at similar markets in the larger cities. Some urban entrepreneurs package UmMemezi powder in small bottles and sell it in herbal medicine shops. With the increased commercialisation of the product, recently a factory-processed and packaged product has also become available in the central business districts of some provinces. Consumers simply buy the dried bark and grind it with a granite stone, or they purchase the bark in a powdered form. This powder is then mixed with water to make a paste, which can be applied daily to the face as a skin lightener.

The sale of dried UmMemezi bark has created a lucrative informal trade. It sells for about US\$ 6.24 per kg. It is estimated that nearly 1600 kg is harvested every year from the Pirie State Forest alone - the main source of supplies. UmMemezi accounts for 14 per cent of the collector-traders' total income from the sale of various wild plants. In large neighbouring cities, this high value product sells for as much as US\$ 19.48 per kg, representing a mark up by street traders, of some 200 per cent.

Most collector-traders are women aged 45 to 65. Understanding the use and value of the bark, they adjust the price depending on the buyer - with white entrepreneurs paying significantly more than black entrepreneurs.



The future for this embattled tree?

The desire for lighter skin has not diminished in recent years despite the end of apartheid. The banning of harmful commercial skin products has only increased demand for the UmMemezi cosmetic and large quantities of bark are being harvested to supply urban markets. However, the number of trees growing wild is very limited and stripping too much bark from them can lead to their death. Couple all of these factors together and the end result is over-exploitation of natural stocks.

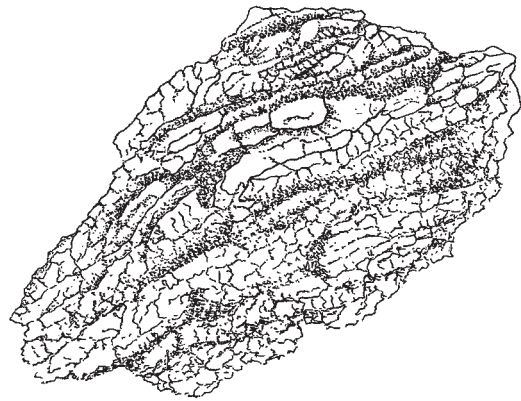
UmMemezi is an understorey* plant that grows wild in certain forests. Despite the rarity and high value of these small trees, there are no managed or cultivated plantations. Most forests containing UmMemezi are State-owned and managed, but the State lacks the capacity to manage the forests effectively and there is very little control over harvesting. Furthermore, there are no customary rules or community forest management programmes, and current harvesting rates are simply unsustainable. Indiscriminate removal of the bark is killing these trees. Few large UmMemezi trees remain after being ringbarked* in the past, raising concern that there are now virtually no mature trees left to reproduce and keep the species alive. This species, the biology of which is poorly understood scientifically, has been listed as critically endangered.

UmMemezi harvesters are often poor, illiterate women who rely on selling wild plant material to support their families. In 1998, the State adopted a Participatory Forest Management Policy that involves local communities more and endeavours to foster sustainable forest use. Commercial harvesting of UmMemezi bark remains illegal, yet its collection continues to occur, largely due to the strong demand for supplies, and the opportunity it provides for poor people to earn income from a free resource. But without appropriate steps being taken to increase user groups' ownership of and responsibility for the resource, the likelihood of sustainable extraction* is extremely low.

There is an urgent need for studies into this tree's biology, alternative harvesting methods and the potential for domestic cultivation at a grassroots level to ensure that this species is not harvested to extinction. The bark gatherers are traditionally subsistence farmers and possess farming skills as well as ecological knowledge of both the forest and the species itself, which would be essential for successful domestication*. Further research is also recommended to determine whether parts of the tree other than the bark can be used, to possibly reduce the destructive bark harvesting.



Warburgia salutaris (Bertol. f.) Chiov.



Warburgia medicinal bark

Zimbabwean case by Anthony Cunningham

Muranga returns! Zimbabwean medicinal bark

This is the story of the reintroduction of Zimbabwe's most important medicinal plant species. In the 1970s, the 'pepper-bark tree' (*Warburgia salutaris*) was over-exploited, becoming locally extinct* within its natural habitat* - the margins of high altitude, evergreen* forests. But in recent years, farmers have been replanting *Warburgia* in agroforestry* systems – heralding the return of this economically and culturally important tree.

The pepper-bark tree produces an effective medicinal bark which has been traditionally used in southern Africa. A natural anti-microbial* remedy, both the bark and leaves are used to treat yeast, fungal, bacterial and protozoal* infections. They are also used as a diuretic and in the treatment of dyspepsia. The bark and leaves have a hot peppery taste and are commonly chewed in an unprocessed form, or the bark is ground into a powder. Locally known as 'muranga' (Shona), 'isibaha' (Zulu, siNdebele, siSwati) or 'chibaha' (Tsonga), *Warburgia* bark can be found for sale in the urban markets of Mozambique, Swaziland, South Africa, Lesotho and Zimbabwe.

Warburgia salutaris trees have simple, glossy leaves and generally grow 5-10 m high, although they can reach up to 20 m. In southern Africa, this species has a limited distribution and was recently listed as a vulnerable regional species by the World Conservation Union (IUCN). The situation in Zimbabwe however, is particularly acute. Wild growing *Warburgia* trees were formerly restricted to forest ecotones* on a few moist, high altitude sites in south-eastern Zimbabwe. But the high commercial demand for their bark has led to the depletion of these stocks.

Over-harvesting of muranga trees

The combination of weak land tenure, destructive bark harvesting and the high value of this product has had a negative impact on muranga stocks throughout southern Africa. In the early 1930s, the German botanist Jacob Gerstner, who spent many years living in northern KwaZulu, South Africa, recorded that bags of muranga bark were being transported from Hluhluwe to Durban for sale. For more than a decade he attempted to collect the flowers or fruits of this species for scientific identification but all he found were sterile coppice* shoots sprouting from already exploited trees. In 1972, three Zimbabwean botanists had a similar experience, finding only a few dead or dying trees and collecting the last root coppices to plant six trees in the Harare Botanical Garden. Today, these have grown tall - but they too are being debarked!



By the late 1990s, muranga had become locally extinct due to over-harvesting for medicinal purposes. Bark supplies then had to be brought into Zimbabwe from the Mozambican side of the Chimanimani mountains. The destruction of muranga populations in Zimbabwe was

seen as a conservation problem as well as an issue of concern to local people and traditional healers, who lost access to this important herbal medicine.



High market prices led to pepper-bark trees being completely girdled and large branches being chopped down to obtain the bark. When all the above-ground bark has been removed in this way, roots are then dug up and the root bark is taken as well - signaling the death knell for the tree!

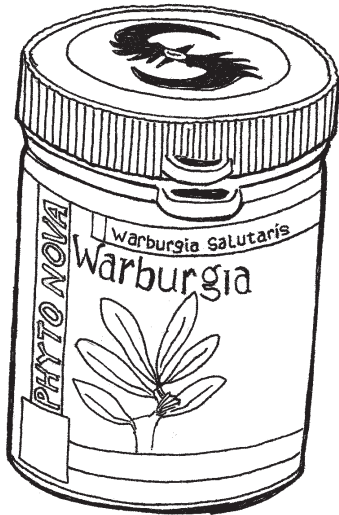
Reintroducing muranga

In 1996, the World Wide Fund for Nature (WWF), United Nations Educational, Scientific and Cultural Organization (UNESCO) and the Kew Botanical Gardens People and Plants Initiative carried out a "local needs" survey. The results showed that the reintroduction of muranga through the transplanting of rooted cuttings* was a viable option for four reasons. Firstly, this tree species has a high cultural value

associated with its medicinal role. Secondly, the reintroduction of muranga is useful from a conservation perspective. Thirdly, the high value of the bark (around US\$ 33 per kg in Zimbabwe), coupled with its vigorous resprouting ability and reasonably rapid growth rate, suggest that it is an economically viable agroforestry tree species. Finally, several thousand rooted cuttings were available from a South African forestry company which had mass produced *Warburgia* plants from cuttings in the mid-1990s when the pepper-bark tree was nominated as South Africa's 'Tree of the Year'.

In late 1997 and early 1998, a pilot project was set up to reintroduce *Warburgia* seedlings back into Zimbabwe. This was coordinated by WWF-Zimbabwe and the local non-government organisation, SAFIRE (the Southern Alliance for Indigenous Resources). However, despite meticulous documentation (phytosanitary* certificates, export and import permits), careful packing in cooler boxes and the expense of air-freighting 1200 cuttings (temporarily removed from the soil for phytosanitary reasons), the young trees had a rude awakening. They were delayed by Zimbabwean Customs for several hot summer

days before SAFIRE was able to rescue them. Several hundred seedlings died but enough survived for planting out in the south-east of the country - the species' former Zimbabwean heartland. Importantly, this reintroduction did not take place in the forests, as the lack of individual rights would have been likely to lead to over-harvesting again. Instead, the seedlings were planted into the home gardens of local farmers.



Warburgia and other traditional African medicines, like *Sutherlandia* and African Ginger, can be bought via the internet. *Warburgia* is described as the most valuable of the natural African anti-microbials and the bark and leaves have been used to treat infections for centuries.

In 1999, a group of botanists, economists and rural development field workers assessed the muranga reintroduction as part of a University of Zimbabwe training course. Their economic analysis of this pilot project, along with market price data from a survey of local herbal medicine markets, strongly suggest that the reintroduction of *Warburgia salutaris* in south-eastern Zimbabwe is a viable practice. The replanting also has great potential to enhance the conservation of an endangered species while simultaneously improving the livelihoods of local rural people. The muranga cultivation is profitable and beneficial for both social and economic reasons, particularly for traditional healers (with a benefit to cost ratio of 42:1) and also for small-holder farmers (with a benefit to cost ratio of 24:1).

The social values of this species are important to consider at a time when HIV is widespread in southern Africa, and most Zimbabweans are facing economic chaos, hyper-inflation and declining access to pharmaceutical medicines. *Warburgia* bark from cultivated trees represents a source of income and also contributes to local self-sufficiency in health care. In South Africa, pills containing freeze-dried *Warburgia* leaves are being used to treat secondary infections in patients with HIV. Fresh leaves can also be used – and these are now being harvested by the farmers who planted muranga and who have assisted its return to Zimbabwe.



Harpagophytum procumbens subsp. *procumbens* (Burch.) DC. ex Meisn

Devil's claw medicinal root

Namibian - Botswanian - South African case by Rachel Wynberg

Devil's Claw: The root of traditional and modern medicines

'Devil's claw' is said to stir wild animals into a crazy dance to rid their feet of its thorny seeds, but the root of this weed, which grows in the red, sandy soils of the Kalahari Desert in southern Africa, brings welcome relief to humans the world over. The plant's roots are highly valued both locally and in the West for treating a wide variety of human and livestock ailments.

Traditionally, the root is used to relieve fever and labour pain, cure blood diseases, ease muscular aches, pains and stomach problems, and treat sores. This traditional knowledge led a German researcher to realise the plant's commercial potential and commence its exportation in the 1950s. In the West, extracts are widely used in pharmaceutical products, herbal remedies and cosmetics. The plant is best known for its role in the treatment of arthritis and rheumatism, and studies have confirmed its anti-inflammatory properties. Extracts are considered comparable with cortisone and the drug phenylbutazone, but without the side effects.

A gift from the desert

Two related species are used: *Harpagophytum procumbens* and *Harpagophytum zeyheri*. They are easily confused, but *H. procumbens* is the most commonly traded and internationally recognised. Devil's claw is a sprawling, low-lying plant with grey-green leaves and pink flowers, which develop into fruits with several long arms and sharp, hooked thorns. These catch on the wool, tails or feet of passing animals, serving to disperse* the seeds within. The most common name, 'devil's claw', is thought to originate from the bedevilled dance of animals desperate to dislodge the prickly seeds, but the plant also goes by around 20 other local names.

Devil's claw grows in sandy, arid regions, surviving dry periods by forming water-storing secondary roots* that sprout from the main tubers*. Medical treatments are made from these secondary roots, which sprout as far down as 2 m, vary in length from 4-25 cm and are up to 6 cm in diameter.



A wealth of traditional knowledge underpins the Western use of devil's claw.



Devil's claw is most abundant in arid regions, where there is little grass cover and shrubs and trees are sparse.

Devil's claw is considered a weed and is often more abundant in disturbed, trampled or overgrazed areas. Thirty years ago, villagers reported devil's claw was common around their homes. Nowadays, collection requires "camping out" because the plant is no longer found within an easy distance for daily harvesting. Drought and goats are partly to blame for the scarcity but commercial harvesting is also taking its toll. On the other hand, the remoteness and inaccessibility of these plants in many areas affords them some measure of protection.

Nonetheless, harmful harvesting techniques, combined with an escalation of international trade, have raised concerns about this plant's future. There is discussion about listing devil's claw under the Convention on International Trade in Endangered Species (CITES)*, which monitors trade in species considered at risk in the wild. Companies are also increasingly looking at the plant's potential for cultivation, but often without considering the broader social, economic and environmental impacts. Successful cultivation could reduce pressure on wild stocks but also, disadvantage impoverished rural people who rely on collecting devil's claw as their only source of cash income. Listing the species under CITES would further affect trade from the wild.

Harvesting and processing

Devil's claw is harvested in some of the most inhospitable and arid parts of southern Africa. People in these areas, like the San, are among the most marginalised groups - often extremely poor and with few ways to make a living. Devil's claw is a very important source of income for about 9 000 such people.

Permit conditions introduced in both Namibia and Botswana confine harvesting to the dry period between March and October, a restriction imposed largely to curtail over-harvesting. Methods of harvesting differ between areas and can be destructive if the whole plant is removed. If the secondary roots are removed carefully however, leaving the main tuber, harvesting need not kill the plant - and there is growing awareness about this method. After collection, the roots are washed, peeled and sliced into pieces, then sun-dried on suspended nets. The dried root is then packed into bags and stored, ready for sale. Further processing is mostly done in Europe.

A valuable commodity

Devil's claw has been traded internationally for more than 50 years, with most exports going from Namibia to Germany. There has been a substantial increase in export volumes and about 600-700 tonnes, worth US\$ 100 million, are traded each year. Trade chains are complex and vary between countries. In most cases, harvesters supply local traders, who then sell the dried roots to local exporting companies. In some cases, non-government organisations (NGOs) help harvesters trade directly with exporters, or purchase material themselves for export. Five to ten companies - one of which controls 75 per cent of world trade in devil's claw - dominate the European market. Most profits are realised at this level: harvesters receive US\$ 1.20 per kg, and local exporters US\$ 1.40-1.80 per kg, while the retail price in the West is US\$ 140 per kg.

Trends

If managed well, devil's claw could: be harvested sustainably*, contribute to rural livelihoods and bring economic benefits to southern African nations. Some governments have good policies in place, but monitoring and enforcement is extremely difficult, especially in the remote areas where devil's claw grows. Harvesters lack good business and management skills, and there is insufficient cooperation among traders and the governments of exporting nations. There is virtually no value-adding within the region, and government policies to protect the species and monitor trade are confined to nature conservation departments rather than the more strategic departments of trade and industry. At the international level, insensitive cultivation efforts and monopoly control of the trade prevent producers getting their fair share of the plant's commercial potential and profitability. All this, combined with the difficulty of competing against sophisticated Western companies, weakens the bargaining power of local traders and harvesters. Such issues could be addressed in part, through harvesters' associations.



Sometimes deep, wide holes are dug with a spade to extract the entire root. However, this harvesting technique is destructive for both the plant and its broader environment. A preferable method is to harvest only the secondary tubers whilst leaving the main tap root intact.



Azadirachta indica A. Juss.

Woodcarving

Kenyan case by Simon K. Choge

Wooden animals from Kenya: Leaving tracks around the world

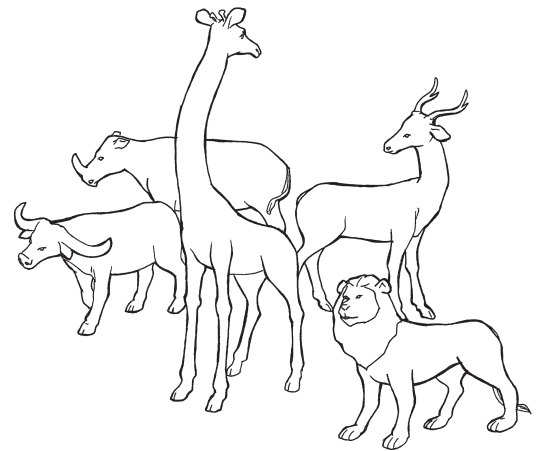
Kenya is world famous for its wooden carvings. Mutisya Munge, a muKamba man from Wamunyu, in the Machakos district, pioneered the production and trade of woodcarvings, as far back as 1919. Today, the waKamba people (muKamba=singular, waKamba=plural), who live in the drought prone, eastern parts of Kenya, create most of the country's carvings. They largely contribute to making Kenya the biggest producer of African woodcarvings for international trade.

Kenyan carvings are exported to countries like the United States of America, Canada, Japan, Spain, South Africa, Germany and the United Kingdom. Popular figures of wild game such as lions, giraffes, rhinos and elephants, along with many other types of wooden sculptures, are the end result of an often lengthy production and marketing chain, which all begins with the acquisition of wood.

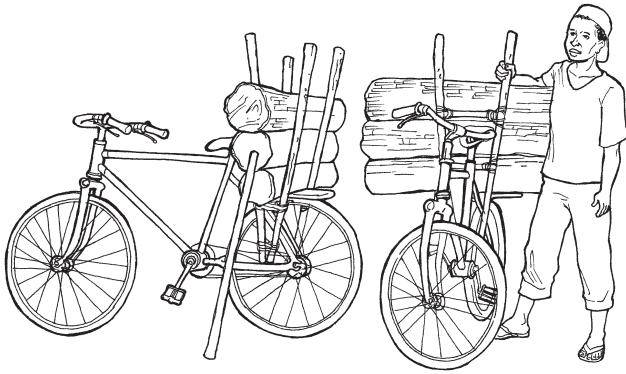
Carving out a living

Kenya is home to 60,000-80,000 carvers who in turn, generate the main source of income to support around 400,000 dependants. These carvers depend upon wood from forests, farms and bushlands and each year, about 50,000 trees are felled to supply the commercial carving trade. Unfortunately, only a relatively small number of tree species are suitable for quality carvings. Most of the preferred wood comes from very slow growing species found in forests and woodlands. However, due to intense harvesting their natural populations have been severely reduced. Many carvers living in depleted areas have since moved to other provinces (such as Central Kenya and the coast) in search of new raw materials and markets.

Over 60 per cent of woodcarvings are currently made from *Brachylaena huillensis*, known locally as 'muhugu'. However, it can take 100 years for these dry forest trees to attain a girth of around 40 cm and a height of 25 m. Supplies from these trees have been dwindling in recent years due to the high demand and long time span required for regeneration. As a



Carvings are created from the wood of various tree species.



Bicycles, handcarts and vehicles are used to transport the wood to carving centres.

result, alternative woods have been sought from species like *Azadirachta indica*, locally known as 'neem'. This introduced species* is widely distributed along the Kenyan coast and is increasingly being used for woodcarving. It is sometimes viewed as a weed due to its abundance and profuse natural regeneration but this abundance and its fast growth rate and good carving qualities make it an excellent substitute for the favoured but depleted indigenous* hardwoods*.

Wood for carving is usually harvested from forests, woodlands and farms, and is generally obtained with the aid of a power saw operated by a single person. Wood dealers, who are the main collectors, scout for supplies from both distant and nearby sources, buying from land owners and harvesting and delivering the wood to carving centres.

The commercial chain

Woodcarvers acquire their skills and training through working closely with experienced carvers for several years, learning how to specialise in certain types of products. The production of carvings is very labour intensive and involves several processing steps, including filing, sanding, painting and polishing. Products made from fresh or juvenile wood are dried in the shade for several days before the final touches are applied. The finished products are then sold to dealers or tourists. It is exclusively men who carve although women sometimes help with polishing and painting, particularly at a household level. With a trend towards the specialisation of activities, some carvers also contract out time demanding stages like sanding to skilled operators, whose work creates a nice smooth finish and results in the products fetching a higher price.

Generally, woodcarvers work in groups or co-operatives for the convenience of obtaining wood supplies and marketing finished products. Established groups sell their products through show rooms located at strategic places in towns and cities. Carvings are also sold in shops, at the entrances to game parks and along beaches and roadsides. Large quantities are exported to overseas markets as well. An increasing number of middlemen are getting involved in the carving marketing chain, buying products from carvers in a semi-finished state, for a cheaper price, and then adding value using skilled workers to sand, polish and paint these products. With a high quality finish, such carvings are destined for exclusive shops in major centres or for the export market.

Links in the chain

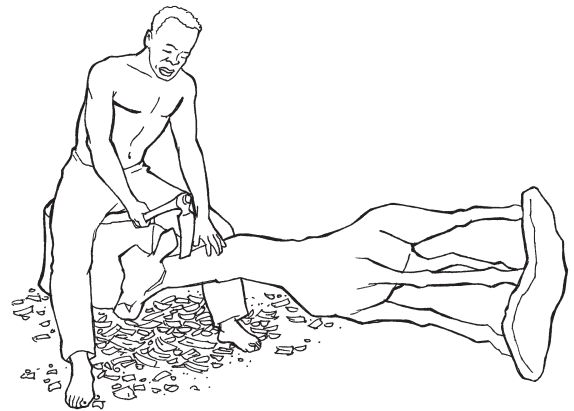
Many steps can be involved in the production of woodcarvings, with profits differing along the various stages of the production chain.

- 1) Wood is harvested and bought for US\$ 12-15 per m³.
- 2) Loading and transport charges are US\$ 2 per m³ and US\$ 0.1 per m³/km, depending on the species.
- 3) Semi-finished products are bought for US\$ 30-66 per m³ (about US\$ 1-2 per carving). Approximately 600 pieces are produced from 1 m³ of wood.
- 4) Skilled workers are hired to sand and polish the carvings, which are sold to middlemen or tourists at carving centres for US\$ 3-4.
- 5) Specialised middlemen and dealers arrange for further finishing and their high quality carvings are then sold in exclusive shops for US\$ 5-10.
- 6) Dealers fill export orders, pricing the carvings at over US\$ 20 each.

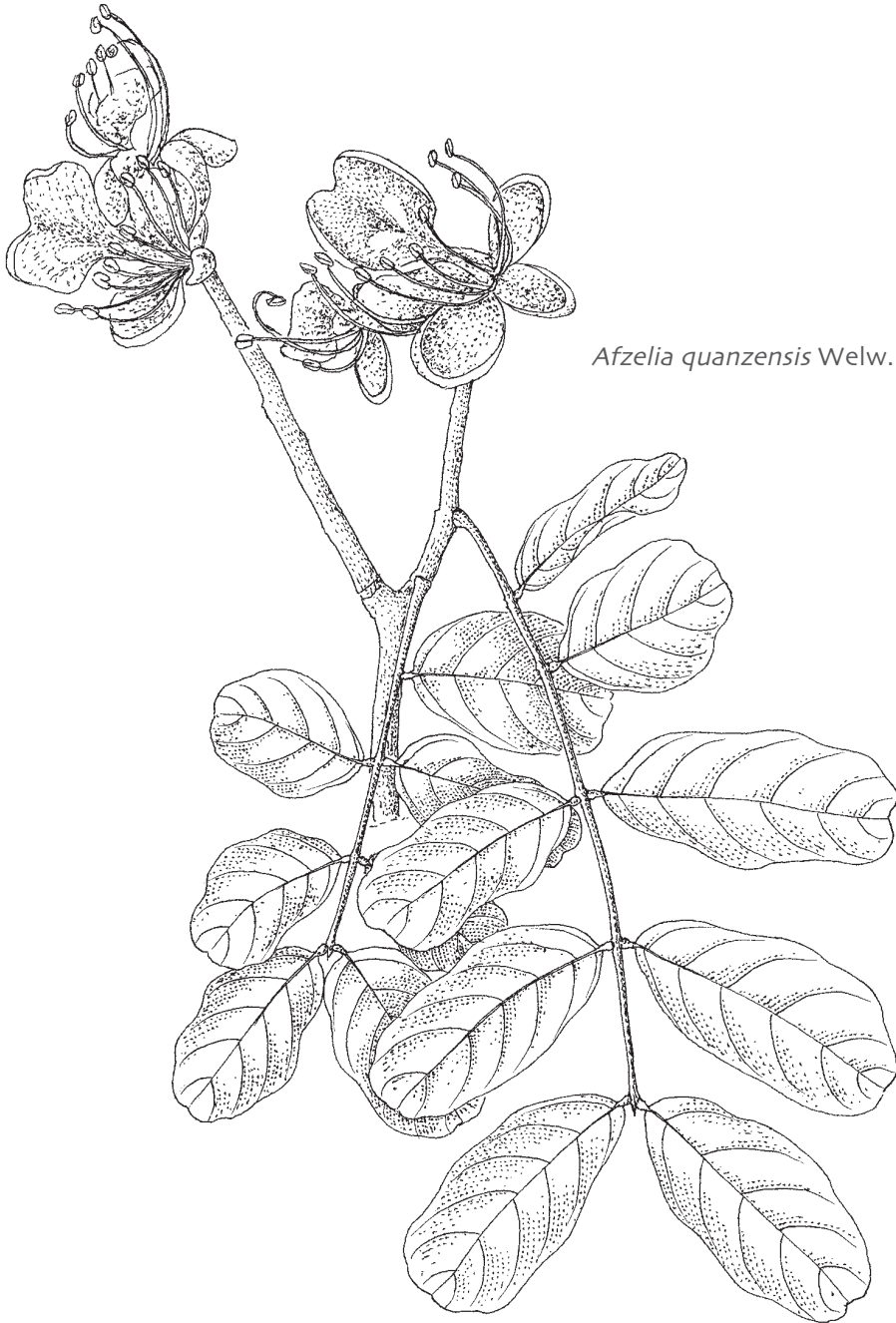
Trends

Increased demand for raw material is leading to widespread depletion of the more popular carving species in the forests and woodlands where these trees naturally grow. Alternative species with similar carving qualities but which are more abundant and faster growing are gradually bridging the gap between supply and demand. Carvers, woodcarving co-operatives and private investors are considering programmes to encourage on-farm production of fast growing trees to make woodcarving a more sustainable industry in Kenya. This is linked with the 'good wood' campaign aimed at developing sustainable supplies* of wood from sources outside natural forests - using species such as *A. indica*, which can be planted in between crops and in plantations. This campaign also encourages buyers to choose 'good wood' carvings. However, it is currently difficult to distinguish between these products and those made from the scarcer woods.

There is a clear need to assist both traders and buyers with the identification of carvings made from 'good wood'. This could be achieved through attaching labels from an independent certifier to carvings which are made exclusively from 'good woods' and/or are tied to a strategy aimed at supplying wood (both 'good woods' and indigenous species) from plantations and farms.



Carvers develop their skills through many years of experience and are able to quickly transform pieces of wood into sculptures, using simple hand tools.



Afzelia quanzensis Welw.

Woodcarving

Zimbabwean case by Wavell Standa-Gunda

MuKamba: Woodcarving from a rain-making tree in Zimbabwe

This is the story of the *Azelia quanzensis* tree, which the Shona people of Zimbabwe call 'muKamba' and the Ndebele people know as 'umkamba'. In English, it is referred to as 'pod mahogany'. Throughout Africa, the roots, seeds, leaves and wood from these dry forest trees have a long and varied history of use, in both urban and rural households. Culturally, because of their large size, muKamba sites have often been used for rituals, rain-making and spirit appeasement ceremonies. The root is traditionally used in herbal medicine as a treatment for chest pains, kidney problems and snakebites. At times, spiritual healers have used the striking red and black seeds to exorcise bad omens, while women have found an alternative use for the seed pods - as decorative necklaces.

During droughts and food shortages, muKamba leaves are eaten as a vegetable and the wood has long been used as a raw material for the household manufacture of domestic equipment like yokes, stools, spoons and plates. Such items are sometimes bartered in exchange for food or even social capital. In recent times, the wood has attracted a more commercial focus as well, in the production of woodcarvings and modern office and home furniture.

The woodcarving boom

In Zimbabwe, the escalation of trade in woodcarvings is linked to various national and regional events. Firstly, the collapse of apartheid* in South Africa and several years of domestic political stability in Zimbabwe led to increased tourism between the two countries. The devaluation of the Zimbabwean dollar contributed to the woodcarving boom as well - making the country more attractive to tourists. Another factor was the serious droughts of the late 1980s and early 1990s, which forced many people to find alternative sources of income to supplement their agro-pastoral activities*.

Growth in the number of craft producers and markets has been phenomenal. The number of roadside markets selling woodcarvings and other handicrafts along the 300 km stretch



Poles fashioned from the wood of muKamba are used for grinding maize.

of road linking Masvingo to Beitbridge, on the route connecting South Africa with Central Zimbabwe, has grown from just a few in the late 1980s, to more than 25 in the late 1990s, directly involving approximately 4,000 people. Recently however, the country's political instability has resulted in a general decline in the industry, the Zimbabwean dollar has been over-valued and fewer tourists are entering the country.

Harvesting the trees

MuKamba trees are naturally found in eastern and southern Africa, in woodlands and dry forests. These drought resistant* trees grow to 12-15 m but sometimes reach up to 35 m. As it is illegal to cut these trees, secret harvesting occurs at night. Alternatively, Zimbabwean laws allowing villagers to collect dead trees are exploited, with harvesters ring barking* the trees and leaving them to die. They later cut them with an axe or hand saw (as none of the wood harvesters own a motorised power saw). If it is a large tree, the harvesters may dig around the edges to a depth of around 1 m, setting fire to the root system and pulling the tree down with ropes and oxen if it doesn't fall. Such harvesting techniques are destructive and leave nothing for regeneration.

Processing the wood

Rough carvings are shaped with chisels into African animals like hippos, giraffes or warthogs. Next, sandpaper is used to smooth the carvings before they are polished with floor or shoe wax. This whole process can take up to 15 days, earning the carver an average US\$9 per product. Financial returns for carvers vary between markets and over time. Woodcarvers generally earn between US\$ 100-500 per person, per month, depending on market conditions and the level of tourism, with the peak months being in August and January.

In Zimbabwe, unlike woodcarving industries in other parts of Africa, and especially Kenya, there is no specialisation. The same person carries out all of the activities involved in woodcarving in Zimbabwe, from harvesting through to selling. In Kenya, where there is a greater degree of specialisation, the product quality is high and the prices fetched per cubic metre of wood are also higher than in Zimbabwe and Malawi.



Small branches are taken for firewood, while the larger ones for carving are removed with an adze (chisel-like tool) or axe. This reduces the weight of the log for transporting to the homestead or roadside market, where the final carving takes place.

Avoiding the bust - fostering more sustainable trade

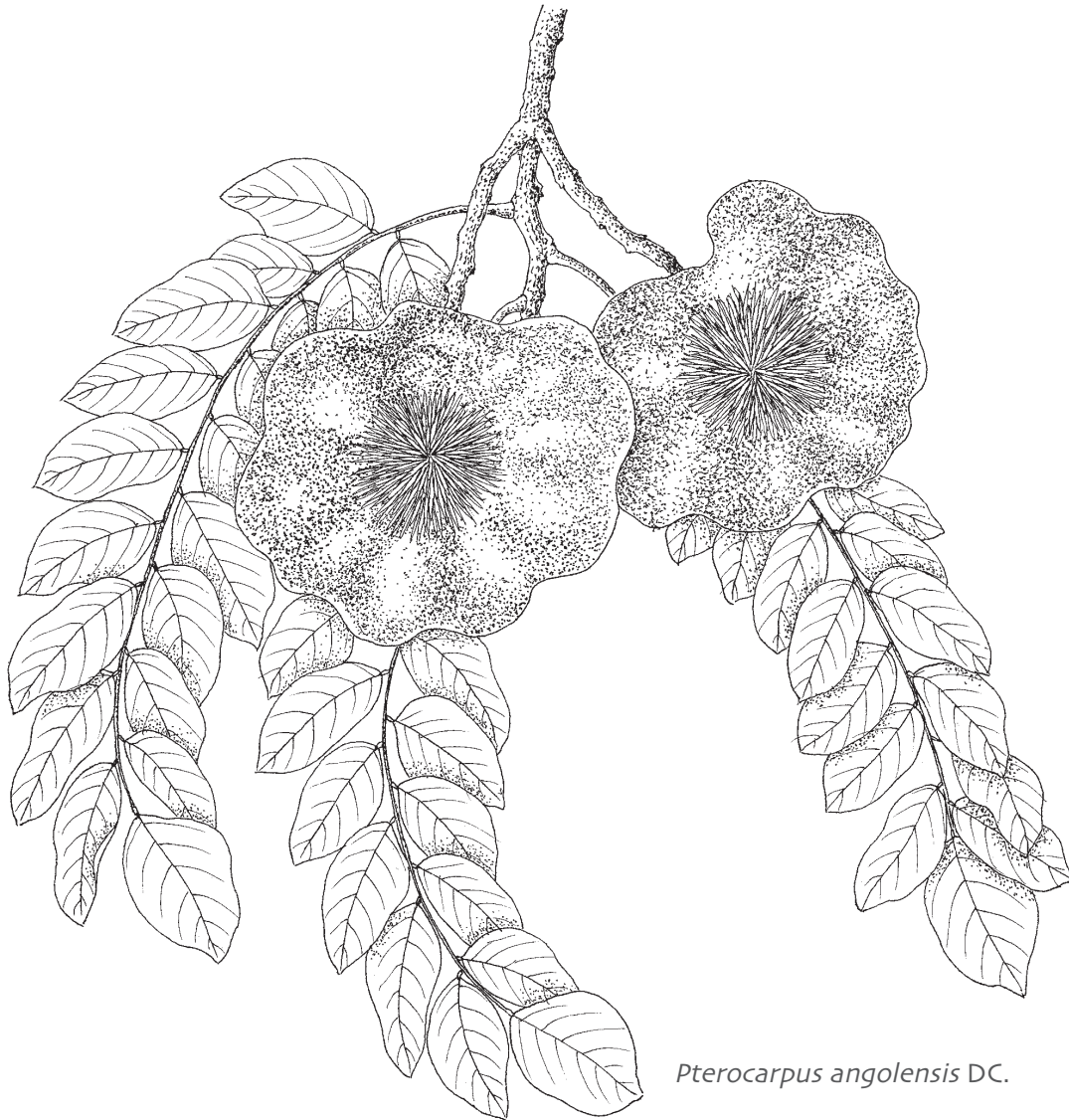
The sustainability of the woodcarving industry depends entirely on the future supply of raw material. The region's forests are unlikely to be able to sustain the current rate of harvesting, signaling future scarcity for woodcarvers and a loss of muKamba's multiple uses and benefits for rural populations. To avoid shortages and conflicts, and to foster sustainable management*, changes are required locally and nationally.

Legislative reform is needed to make woodcarving legal and to shift the control of trees and harvestable timber to a sub-district level. The greatest successes have been where control has been transferred to community organisations such as villages or wards with low populations. To support community management and control, a permit system could be introduced to limit the harvest of timber for carving and the amount of wood that can be purchased by carvers. Such a permit system could also result in the community receiving the payments for harvested supplies.

Valuable lessons can be learnt from the Kenyan experience. In response to the scarcity of indigenous* hardwoods*, timber from alternative species, like jacaranda and mango, is now being used in the Kenyan carving industry. These trees can be found throughout Zimbabwe as well - where their wood could also be substituted for carving. Campaigns promoting the use and advantages of such 'good woods' should focus on providing information to carvers and the tourists buying their products. Both groups stand to benefit from these measures and education campaigns.



Competition characterises the roadside craft markets, where tourists and local buyers browse and hunt for bargains. If they remain in their cars, asking prices through the window, traders need to offer favourable deals, as the buyers are likely to leave at any time.



Pterocarpus angolensis DC.

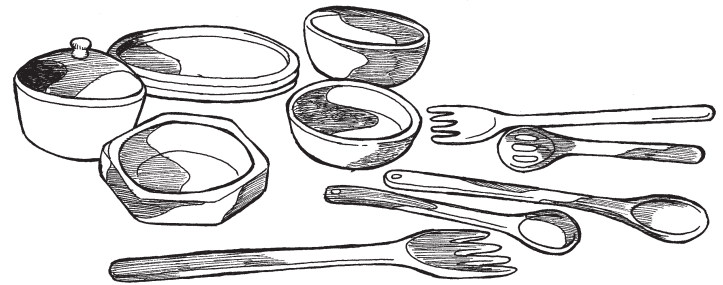
Kiaat carvings

South African case by Sheona E. Shackleton and Charlie M. Shackleton

The kiaat tree: Timber for appetising tableware

Food seems all the more delicious when it is served with beautiful wooden spoons, and green salads are freshly mixed in wooden bowls. There are few more beautiful timbers to whet the appetite than that of southern Africa's kiaat tree. A simple approach brings out the best in this warm brown, medium-grained wood. Leaving their woodcrafts unadorned, carvers merely polish their bowls, spoons, platters, walking sticks and the like, before taking them to catch a tourist's eye at craft and curio markets.

The kiaat tree (*Pterocarpus angolensis*) was greatly sought after during the colonial era, particularly for making furniture. About 50 years ago, a few unemployed men in the region bordering the Kruger National Park decided to try their luck at carving this attractive, hard wood and selling their products to tourists. Many of these original craftsmen are still plying their trade. They have been joined by numerous others, who all work individually from their homes, with the help of their families. Kiaat tableware and utensils are now common items in markets and other outlets in this region.



Carvers produce bowls, spoons and many other woodcrafts, from kiaat's beautiful timber.

Hanging in the balance

Kiaat is an extremely slow growing tree, taking more than 80 years to reach a minimum harvestable size. Its distribution in the woodlands of South Africa is relatively restricted, and years of exploitation are taking their toll. Carvers are finding it increasingly difficult to find suitable trees within the communal lands surrounding their villages, and taking trees from land around other villages is causing social tension. Although the species is state property and legally protected, there has been uncontrolled pillaging in some nature conservation reserves.

Scarcity has led to some substitution with other species but, on the whole, there are few alternatives available. Unfortunately, attempts to propagate* the plant have been largely unsuccessful. The kiaat craft industry thus hangs in the balance as the resource dwindles.

A job between jobs

High levels of unemployment, combined with a shrinking job market, a lack of land for farming and an increased need for cash, have driven many rural households to seek alternative sources of income. Woodcarving and furniture-making represent one widely adopted strategy in parts of South Africa where suitable wood species occur.

Craftsmen tend to enter the industry following retrenchment, with some moving continuously back and forth between carving and formal jobs. Thus, the ability to access wood and fashion it into saleable products is an important safety net for the unemployed.

Carvers harvest their own wood, usually felling whole trees, which they cut into smaller logs and transport home. By law a permit is required to cut the trees and the timber is paid for, albeit at a very subsidised price compared with the open market, where it sells for more than US\$ 700 per cubic metre. In their makeshift workshops, carvers meticulously fashion the wood by hand into a range of products using homemade axes, adzes and other tools. Women and children do the sanding and polishing.

Once a carver has adequate stock, he boards a minibus taxi and visits the various informal markets, which are often located at key tourist destinations such as waterfalls, game reserves and viewing points. A selling trip usually takes the whole day, with the craftsman covering 200 km or more. Female traders buy the goods at these informal markets and then sell them to tourists. Sometimes the carvers sell their handiwork to formal retailers, although in recent years the curio shops have begun stocking imported goods from Kenya and West Africa rather than locally made items. The best times for sales are the peak holiday periods of Easter and Christmas.

However, the trade is not a profitable one for carvers, with most simply subsisting from one day to the next. Sales fluctuate from month to month and costs are high, especially the costs of extracting timber and visiting the markets. The considerable labour involved in harvesting and carving is rarely recognised in the prices received, and carvers are often forced to accept exploitative prices in order to pay their taxi fare home and put food on the table.

Competition from other African countries has made South African kiaat craftsmen even more vulnerable. Imported carvings began flooding in after trade embargoes were lifted in 1994. In real terms, carvers are less well off now than 10 years ago, as prices have not kept



Kiaat logs are highly valued due to their beautiful, rich wood, with its contrasting streaked colouration.

pace with inflation. However, dependency on woodcarving remains high, and it is estimated that the carvers obtain around 75 per cent of their annual household income from this activity. Given this, and the dwindling natural resource base, the outlook is not good for these craftsmen - unless the Government and development agencies intervene to help secure their future.

Trends

For kiaat carvers making plain but useful utensils, market opportunities are not as great as for craftspeople producing a wide array of fancier carvings for tourists and export. Only a small number of South Africans are involved in kiaat woodworking, but it represents their principal source of income in rural areas with few jobs and unemployment rates of over 75 per cent. For carvers to continue earning a living and practicing the specialist skills that they have developed, access to alternative sources of wood is essential, and efforts must be made to involve kiaat producers in managing the resource if the trees are not to become locally extinct.

In the last five years, there has been an increase in external support to producers and traders but this needs to be better coordinated, and a more focused long-term effort by all key stakeholders will be required to foster a more sustainable industry. Lessons from other

African countries and elsewhere could also assist this process. New skills, products, organisational structures and perspectives are needed to diversify production and trade in the local industry and bring carvers more into the mainstream - particularly given the competition from neighbouring country imports. Consumers also need to be made more aware of the value of kiaat wood, and the time and effort required to produce carvings and handmade furniture. Local products should be promoted and appreciated, rather than being regarded as inferior to imports and the fancier factory produced items. If such issues can be addressed then there can be hope for the future for the local woodcraft industry.



Market traders sell many different woodcrafts, including kiaat carvings.

