Garcinia kola Heckel

Chewing sticks

Ghanaian case by Dominic Blay, Jr.

Traditional tooth care: Chewing sticks in Ghana

Beautiful smiles come naturally to the people of West Africa, where traditional toothbrushes literally grow on trees. Long before the advent of plastic brushes and toothpaste, West Africans, especially in Ghana, were chewing on green, split stems to keep their teeth healthy and white. Even today, there is hardly a Ghanaian household of any class without chewing sticks.

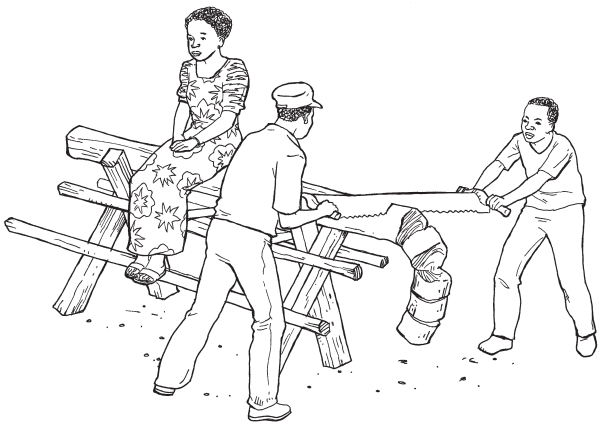
The practice is one of the main reasons West Africans have such good dental health. Medical studies have shown that the sticks are as efficient as synthetic toothbrushes in removing plaque from teeth. This is due to the combined effects of mechanical cleaning, enhanced salivation and the sticks' natural anti-microbial* properties, along with regular use every morning and after meals.

About 70 species of woody plants are used in Ghana as chewing sticks, but the best quality sticks come from 'tweapea' (*Garcinia kola*) and 'nsokar' (*Garcinia epunctata*) trees. These two species grow wild in south-west Ghana, particularly in wet evergreen* and semi-deciduous* forests.

Chewing *Garcinia* sticks help to maintain good dental health.

Garcinia epunctata is a medium-sized, evergreen tree, with a tall but fairly regular and dense crown*. It flowers profusely during the dry season and produces fleshy, edible fruits the size of oranges in the wet season. These fruits are eaten by animals, which then disperse the seeds.

Garcinia kola is a medium-sized, shade-tolerant* tree, with a cylindrical trunk that is slightly buttressed* to the ground. These trees have a dense crown, which is compact but not spreading. Their fleshy, red-orange coloured fruits usually fall to the ground, where both small and large animals (like elephants) feed on them and disperse the seeds. The *Garcinia kola* seeds are also extracted from the fruit and eaten by people in Nigeria and Cameroon as 'bitter cola' nuts. These nuts are eaten fresh or dried as a popular snack, or are ground up and used in traditional medicines.



Cutting the stems down to size in the production of chewing sticks.

Trees on the edge

Wood for chewing sticks is harvested from tweapea and nsokor trees in government-owned forest reserves or in forests over which families and/or clans have tenure. Despite their economic importance, there have been few studies about how to encourage the regeneration of these species, and there are few controls over harvesting in the wild. Harvesters say the trees coppice (or shoot new stems from their base) but these shoots die after a few years.

The Forestry Commission requires all harvesters to buy permits but it does not set quotas nor monitor the amount of wood being taken. There is virtually no management of the resource and little information is available about the rate of harvesting. The length of time it takes *Garcinia* spp. to mature is also unknown. The only deterrents to harvesting are high transport costs and a dislike of small logs among local harvesters. Most harvesters come from outside the areas they operate in. As they rarely return to the same forest, they have little incentive to let trees mature so that harvesting can be more sustainable.

Garcinia spp. are now seriously threatened with extinction in Ghana due to over-exploitation. To meet the demand in the Ashanti and Kumasi region, each month an estimated 4 700 trees are harvested and 12 000-19 000 stems per month are turned into chewing sticks for the Ashanti region alone, in three processing centres. Similar quantities are being processed in other Ghanaian regions like Accra and Takoradi.

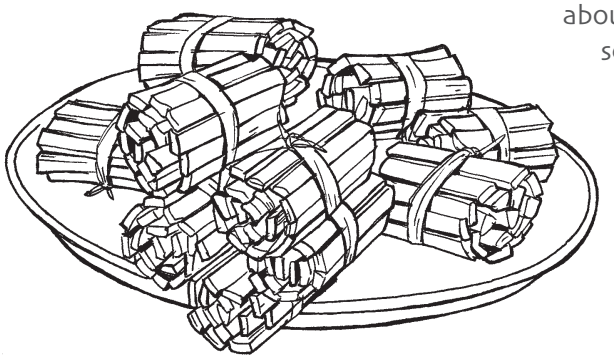
Harvesting and processing

Harvesters cut the stems or 'logs' with machetes or cutlasses*. Some use chainsaws for thicker stems, which can be more than 20 cm in diameter at breast height. Branches are never used because they cost too much to transport and are usually too small for splitting. Harvesting generally takes place between October and March to avoid the wet season, when most forest roads are impassable.

Men and women work in small groups but they are paid individually, according to the number of logs cut or chewing sticks split.

Harvesters make use of other forest products in their daily lives but only earn money from *Garcinia* spp. In some regions, about 80 per cent of household income comes from harvesting wood for chewing sticks. The harvesters usually work in small groups of 3-5 men and carry their logs to nearby roads. These are picked up and transported to towns and cities in trucks loaded with about 200 logs each.

The stems are taken to processing centres and turned into chewing sticks by hand - from start to finish. This is a two-step process taking 1-4 hours. In the first stage, men working in teams of two remove the bark and cut the logs into small sections about 13 cm long. In the second phase, women split the sections into 2-5 cm chewing sticks using knives and mallets. The sticks are then tied into bundles containing 20-30 pieces. Each log yields an average of 750 bundles.



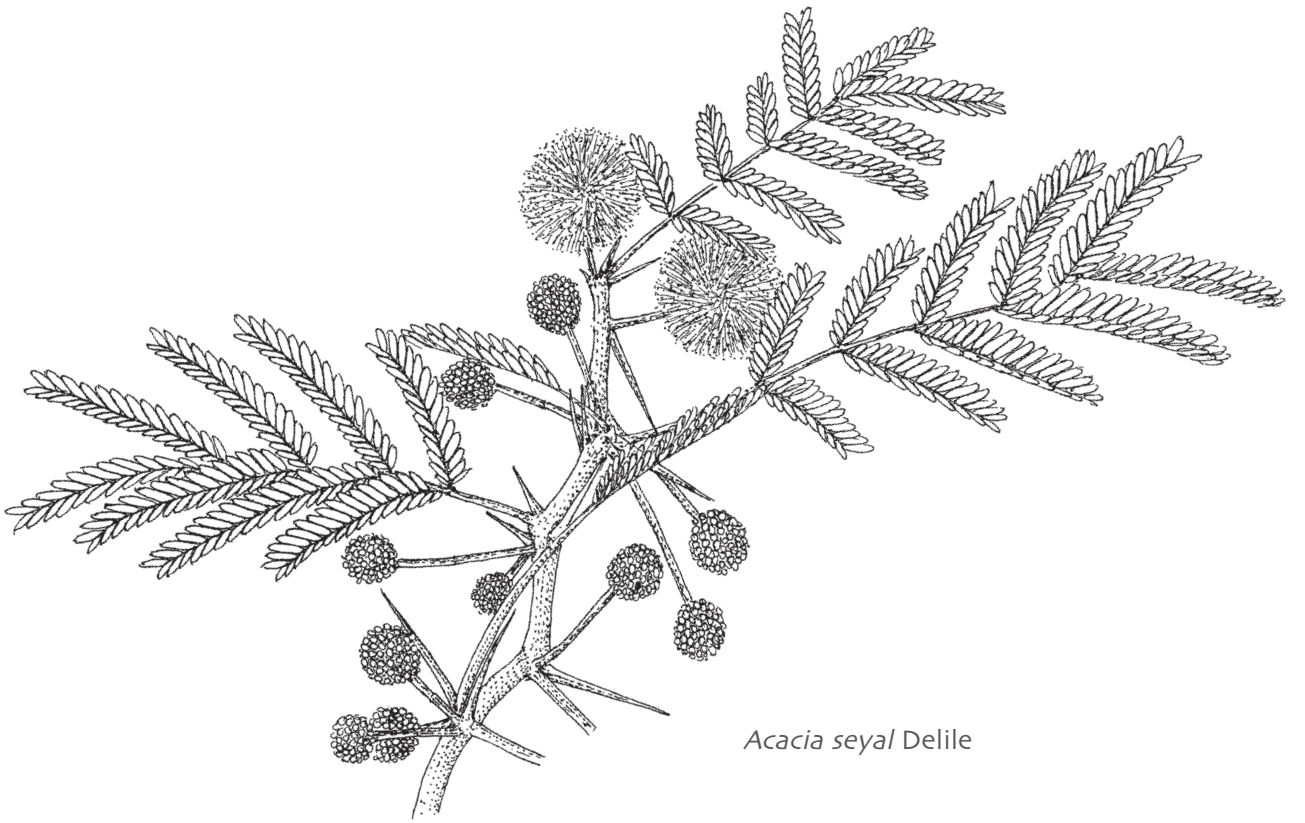
Bundles of 20-30 chewing sticks are sold in local markets and urban centres.

Women earn much less than men for their processing role. Annually men earn about US$ 300-800 for cutting the stems into sections, while women earn US$ 200-500 for splitting the wood into chewing sticks. Workers are paid according to the number of logs they cut or chewing sticks that they split, so they prefer not to share the labour.

Trends

Over-exploitation has seriously depleted the number of *Garcinia* trees growing in Ghana. It now takes more than a week to find enough trees in the forest to harvest one truckload of about 200 stems. This local scarcity is increasing harvesting rates in nearby Liberia and Côte d'Ivoire, and is affecting the livelihoods of harvesters who cannot afford to travel outside Ghana. Scarcity is also driving up the market price of chewing sticks, and some traders are selling poorer quality alternative species. About 70 other species are now being used as substitutes for *G. kola* and *G. epunctata*.

There is an urgent need for appropriate policies, including the monitoring of harvesting rates and the management of *Garcinia* spp. With a sustainable supply, the product has potential to be exported to neighbouring countries, as well as to Ghanaians in Europe and the United States. In spite of the scarcity issues relating to the two preferred tree species, income from producing chewing sticks continues to support many families and to contribute to local and regional economies.



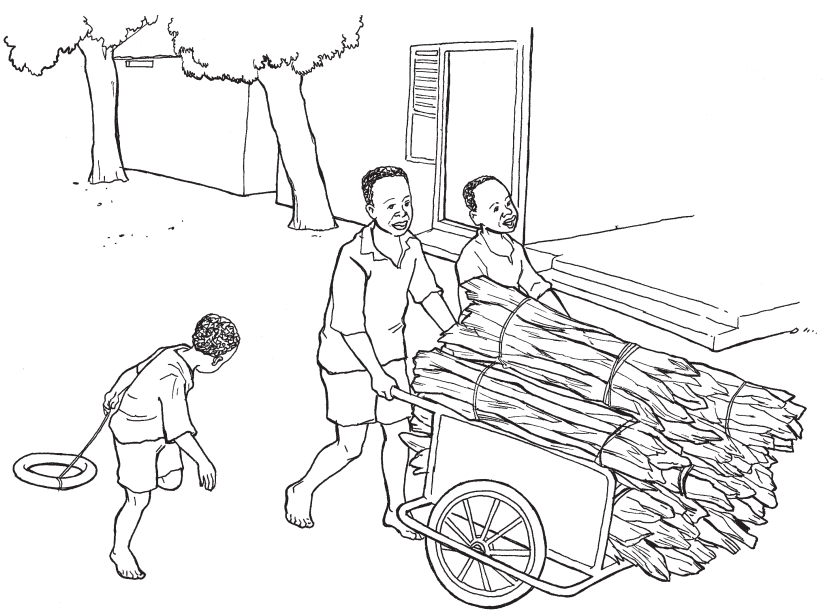
Acacia seyal Delile

Fuelwood

Cameroonian case by Tata Precillia Ijang

Fuelwood in Cameroon: An energy source from the forest

In the Maroua area of the Far North Province of Cameroon, many forest products are gathered from both plant and animal sources. The range of products includes fruits, nuts, oils, medicinal plants, Arabic gum*, bush meat, bark and wood. Fuelwood is one of the key harvested products - an essential source of energy, gathered for both subsistence needs and commercial trade. In many rural areas, like Maroua, particularly where gas and electricity are uncommon and household incomes are low, wood represents the main source of fuel. This is the case not only in Cameroon but also in many other neighboring countries in the region. For centuries fuelwood has remained an affordable and reliable source of domestic energy for the rural populations of developing countries around the world.



Fuelwood is transported as individual headloads*, or by animal, bicycle or push cart. The mobile urban retailers use push carts and cars, while the urban transporters use six or ten tonne pick-up trucks.

In Maroua, where there are few wage labour oppotunities, the extraction of wood for fuel has contributed to income generation, in addition to meeting household energy needs - but it has also contributed to environmental degradation. In this part of the world, wood harvesting is the third most important economic activity after agriculture and the rearing of animals. It is an area characterised by a high population density and harsh, dry climatic conditions. It experiences high temperatures, sometimes reaching 40° C, a long dry season, short rainy season and annual rainfall rates between 760-1000 mm. The plant cover of mixed trees, shrubs and savanna* is quite sparse and many of the plant species have developed specialised structures to enable them to survive in these harsh conditions - including deep root systems, few and small leaves, thorns and thick bark.

Fuelwood harvesting and consumption

In Cameroon, fuelwood constitutes around 60 per cent of the total energy consumed in all sectors and 85 per cent of the energy consumed in households. Maroua reflects this high consumption rate, with two thirds of the total energy consumed by urban households and 100 per cent of village household energy being derived from fuelwood. Village usage averages 586 kg per person each year, at a cost of around US$ 0.03 per kg. Formerly, wood harvesting in this region was mainly undertaken by women, who gathered only dry branches and small trunks for home consumption. Today however, following the increase in demand and the expansion of the commercial trade, a massive amount of felling is taking place, drawing on both dry and fresh branches and trunks. The result has been a drastic reduction in tree cover.

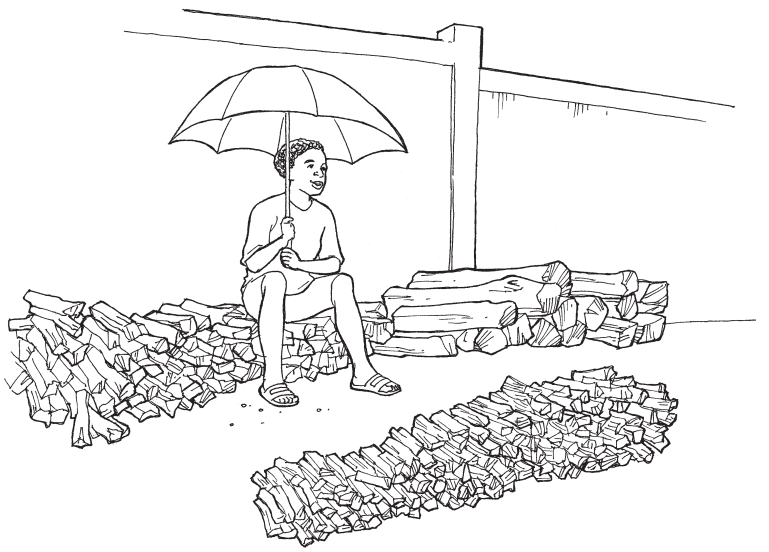
To increase value and maximise profits, successive traders split the wood into smaller and smaller pieces along the trade chain. Logs and big branches are split into large halves, medium halves and small halves (which consumers prefer the most). During processing, the quantity of wood sold per US dollar is reduced, enabling traders to make a small profit.

Now men do the main woodcutting, early in the morning before it gets too hot, with fuelwood sales taking place in the afternoons. The harvesters keep some wood for home use and sell the rest, mainly to wholesalers, although some retailers and consumers buy directly from the village harvesters as well. It is the wholesalers however, who are the main link between the villagers and the urban population. These wholesalers resell to retailers in towns, who employ workers to split, tie and sell the wood to urban consumers. Basically, the marketing chain for fuelwood stretches from the forests to the villagers' local roadside markets and finally, to the town markets, where the main consumers are the urban poor - for whom fuelwood is their only source of domestic energy. Some of the larger stems are also sold in urban centres as poles for the construction and repair of houses.

Acacia seyal - The main source of wood

Most of the fuelwood is harvested from *Acacia seyal,* which grows to a height of around 17 m and fortunately, has a fairly rapid rate of regeneration. The seeds germinate and with little or no assistance, grow quite easily unless they are disturbed by browsing cattle or

bushfires. Full growth is attained after about 10 years, and in areas that have not been completely depleted of stocks, it is quite common to find around 20 trees per square kilometre. Fuelwood from *Acacia* has a high quality, relating to its good capacity to burn and produce charcoal, and the fact that it creates less wood ash and smoke than many other species. These trees can also be used for timber, forage, food, medicine and improving soil quality. However *Acacia* and other tree species are being cut down indiscriminately without much consideration for the age or size of the trees.

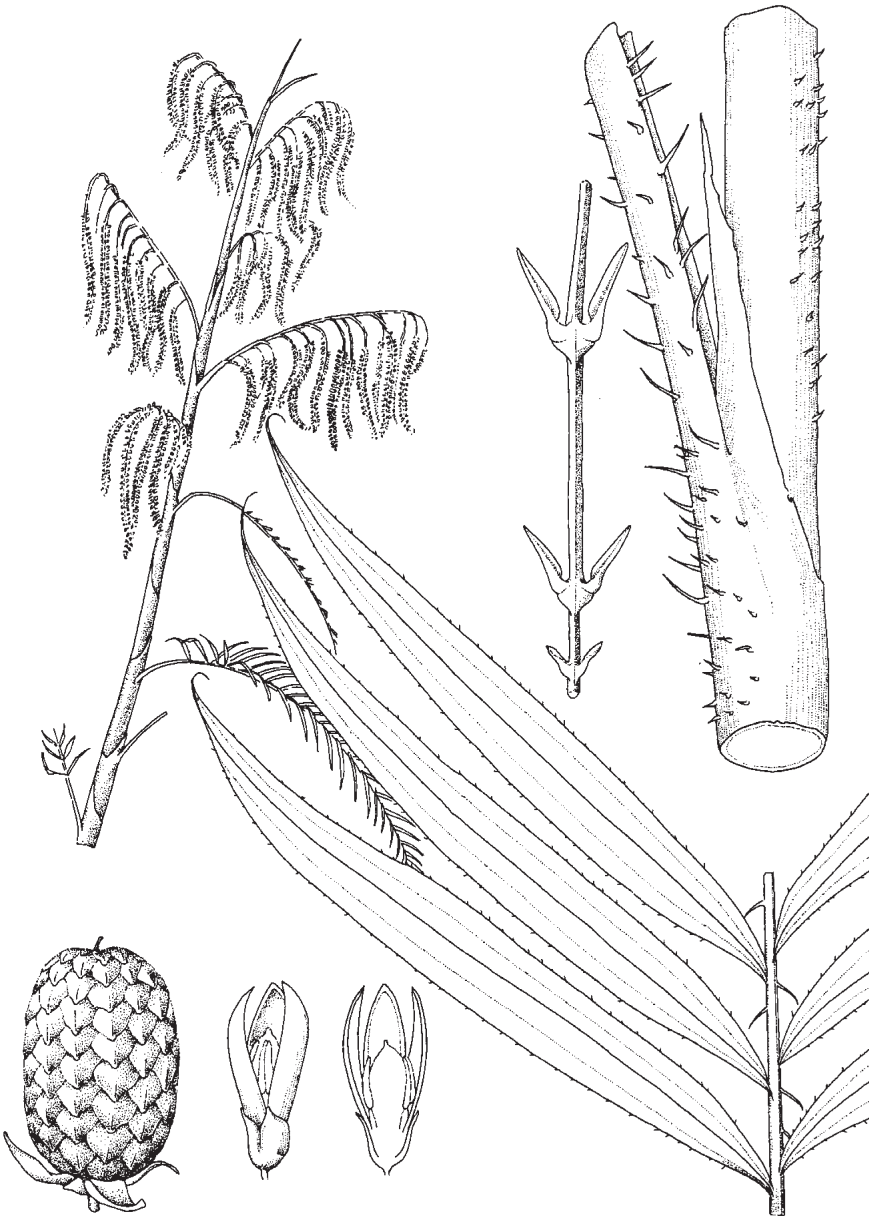


The commercial sale of fuelwood generates valuable cash income for poor rural harvesters and urban traders.

Addressing the issue of declining supplies

The most noticeable change attributed to the intense harvesting of wood is the disappearance of the indigenous* tree cover, leaving behind a wide, empty landscape covered with tree stumps and a few scattered young trees, which often do not reach maturity due to heavy browsing. The trade and demand for fuelwood is increasing, although supplies remain inconsistent, especially during the rainy season. The main reasons for this include the increasing scarcity of local supplies and the need for longer distances to be traveled to reach new collection sites, bad roads and the high cost of hiring vehicles.

Since the collection of fuelwood represents a major source of income for many households, it has been difficult to achieve a reduction in this activity, despite the negative environmental impacts. However, the current level of over-harvesting is not sustainable*. Improvements in management and harvesting techniques are required, along with the more effective use of this product. In a bid to address these issues, there has been an increase in State attention and in the number of non-government organisations and environmental protection programmes operating in the area in recent years. Harvesters have benefited from these developments through education and training, and the resulting improvements to their living conditions, income generation and employment prospects. Some local people have even become motivated to maintain trees on their own plots or plant exotic*, fast growing fuelwood species in the area to help compensate for the disappearance of the natural savanna.



Laccosperma secundiflorum (P. Beauv.) Kuntze

Rattan

Central African case by Terry Sunderland

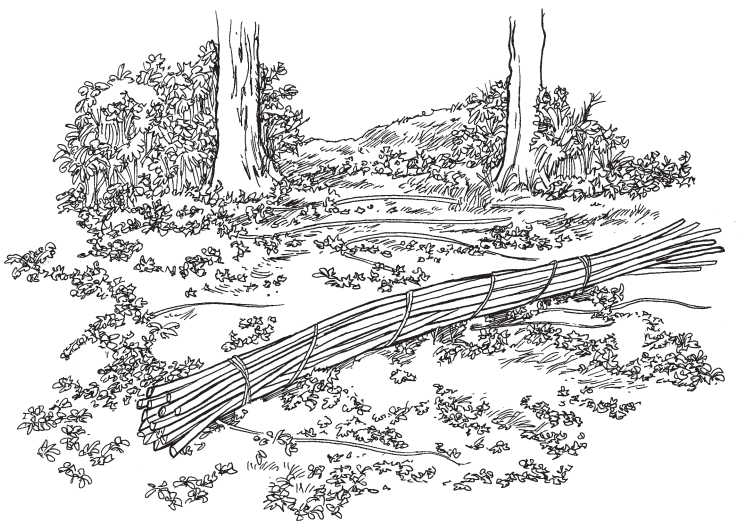
Cameroonian case by Louis Defo and Ghanaian case by Charles Adu-Anning

Rattan: Poor man's furniture turned fashionable

Rattan was once regarded as 'poor man's furniture', made by villagers who could not afford anything else, but the rustic charm of rattan chairs and tables now has a much broader appeal in many different parts of the world.

The word 'rattan' comes from the Malay 'rotang', literally meaning 'climbing palm'. The inner part of the flexible stem is used as 'cane' for making furniture and weaving baskets. The larger diameter canes, from *Laccosperma secundiflorum* and *L. robustum*, are used to form frames, while the smaller diameter ones, from *Eremospatha macrocarpa*, are often split and used for weaving around the framework. Rattan canes are flexible, long lasting and suitable for making many items: like furniture, fish traps, crossbow strings and hammock bridges.

Rattan products are common in rural Africa, but cane furniture has recently become fashionable in towns and cities, and in Europe as well. A thriving harvesting and manufacturing base has developed over the last 5-10 years to supply the growing local and international trade.



Historically, short lengths of cane have been used to discipline school children and in many African schools they are still in use today. Poor children!

A big family

Rattans grow in lowland tropical forests and are widespread in forests throughout central Africa. There are about 600 different species growing in Asia, but only 22 in Africa. Some species grow well in dense forest, while others prefer more open areas, for example, where trees fall and light breaks through the canopy.

The rattans that provide good quality cane in Africa produce many stems from a single individual. As the rattan clump gets older it produces more and more climbing stems and becomes wider in diameter. A really old individual can be up to 5 m across, with up to 50-100 stems in one clump!

As climbing plants, rattans rely on trees for support. Their fast growing stems wind their way upwards towards the light, pulling themselves up into the canopy using 'whips' that extend from the ends of their leaves. These are armed with big hooks, which anchor the palm to the surrounding trees.

Most rattans are also very spiny, discouraging wildlife from eating their growing tips or fruits. However, many animals (including elephants, chimpanzees and gorillas) and birds (such as hornbills) love the juicy, sweet fruits and seek them out, spreading the seeds far from the mother plant as they travel through the forest. Even though the seeds are deposited in their own little pile of compost, they can take up to a year to germinate. Wildlife is very important in rattan regeneration and seedlings are hard to find in forests where hunting has made animals scarce.

Rattan stems are cut from the base of the plant using cutlasses*. The spiny skin is then pulled away, and the stems are cleaned and tied into bundles or rolls. It is a tough job and while some harvesters use thick gloves for protection, others just use their bare hands.

A tough customer

Both the harvesting and processing of rattan is almost exclusively a job for young men aged under 35. This work is usually secondary to farming activities. Men work in the fields all morning, perhaps harvesting a little cane or sending their sons into the forest. They then gather in village squares for the afternoon, working on rattan and discussing community issues.

Whenever you ask a rattan harvester about his job, he will always complain about the many ant bites he gets every time he is in the forest! The raw canes are peeled and dried in the sun before being turned into furniture, baskets, fishtraps and other items. Some items may be sold for cash at the roadsides to passing trade, or exchanged for bushmeat or traditional medicines.

Most of the cane however, is sold to middlemen, who take it to specialised rattan markets in towns and cities, where it is sold to urban artisans. The canes are fashioned into various products and are sometimes varnished prior to sale to give them an attractive, shiny appearance and to ward off termites and other insects.

Management

Rattan is not well managed throughout Africa. Anybody can harvest the cane if they pay the nearest village a small fee or give a gift to the chief and his council. The development of a wide network of logging roads has also opened up previously inaccessible forest areas.

This open access has led to unsustainable practices. Harvesters indiscriminately cut everything from the rattan's base clump, even the young stems, just to get at the mature cane. But this doesn't allow the clump to regrow and produce new stems for future harvests. Collectors then take their destructive practices to new sites and as they move through the forest, the rattans are either killed or take a very long time to recover. Some harvesters now complain they have to travel further into the forest each time they want to gather cane. The added transport and labour costs are slowly pushing up the price of raw cane in the urban markets.

Because of the long time it takes for rattan seeds to germinate and the fact that rattan is still found in the forest, farmers do not cultivate the palms on their land. However, once rattan is established, it can grow up to 7 m in length per year, which means there is potential to grow it on farms using fruit trees for example, for support.

Trends

Cane products have become fashionable in Europe and among urban dwellers in many African cities. As the quality of the finished products has increased, the perception that they are traditionally 'poor man's furniture' has faded. The rising cost of timber has also boosted demand for cane as a less expensive alternative.

However, this growing market is promoting uncontrolled harvesting. Although rattan palms are generally common, harvesters are being forced to travel further and further into the forest. The introduction of small-scale cultivation coupled with a more regulated wild harvest regime could significantly help to foster the long-term sustainability of the rattan resource in Africa.

In rural communities, local people are often harvesters as well as artisans, making products for sale. However, most of the harvest is bought by traders and is destined for cane markets and finally, the hands of urban artisans.

Rattan in Cameroon

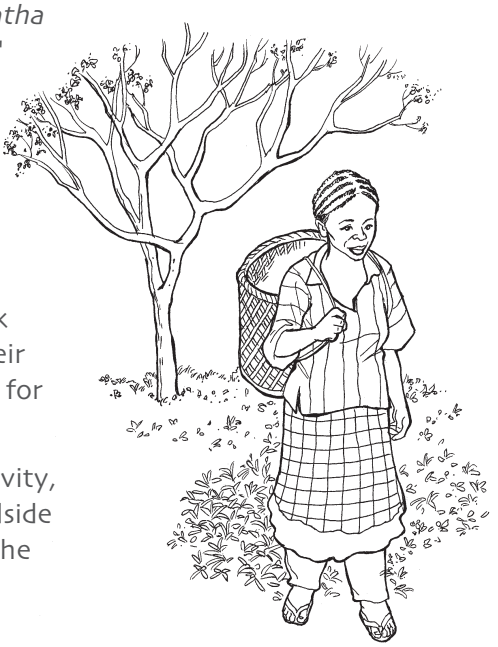
As in other African countries, local populations in Cameroon have used rattan canes* for centuries, mainly for fine weaving, basketry, housing construction and making furniture. During the period of European colonisation, traditional production started to change and a new style of rattan processing was introduced. The 'modern' rattan cottage industry, which produces new designs of baskets, shelves, beds, tables, chairs and many other items, has witnessed the progressive development of a commercial dimension in both rural and urban areas.

Harvesting and Processing

Rattans are widespread throughout the humid forest zone of Cameroon. In the Yaoundé region for example, this forest product is of economic, social and cultural importance, ranking second only after agriculture in village production systems. The two main commercial species are *Laccosperma secundiflorum* and *Eremospatha macrocarpa*, locally known as 'ékè' (maraca rattan) and 'nlong' (fillet rattan) respectively. These rattans are gathered completely from wild stocks, mainly by men, who alternate rattan harvesting with other income-producing activities.

After being harvested with cutlasses*, the rattan canes are bundled together and carried back to local villages, where they are later processed or made into items for sale. Alternatively, they may be carried directly to roadsides and transported by car or truck to the urban rattan market in Yaoundé. Here, the harvesters sell their cane directly to processors, receiving around US$ 0.22 per metre for nlong and US$ 0.03 for ékè.

Villagers and farmers manufacture rattan products as a sideline activity, but in the urban areas rattan artisans work full time, in small roadside workshops. The individual craftsmen undertake almost all the manufacturing stages themselves - including scraping, drying, splitting and bending the canes, constructing the framework for various items, weaving and varnishing. They use simple, manual tools like knives, hammers and hand saws, along with gas blowtorches to assist with bending the material into the desired shape.



Rattan baskets are important items in the daily lives of rural people.

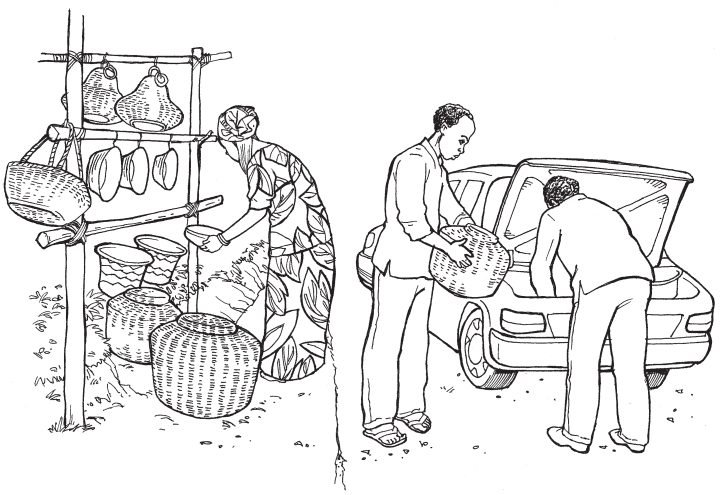
Rattan processing is done mainly by young men, many of whom became rattan basket makers after the country went into recession and unemployment levels rose.

Marketing the finished products

The rattan craftsmen generally sell their products directly to consumers - to other villagers or passers by in rural areas, or to city dwellers in the urban markets. As a result, middlemen are quite scarce. The market prices range from around US$ 0.36 (for a small basket) to US$ 380 (for a higher end dining setting). Nearly all of the products are sold on the domestic market, with only a very small quantity going for export. The export market remains largely unexplored but has a lot of potential given the international demand for rattan products. One of the issues to be addressed though is that the quality of the African end products is not as good as those produced in South-East Asia.

Trends

In the Yaoundé region of Cameroon, many families depend on rattan as a source of money, and in producers' households it represents about 42 per cent of overall cash income. Harvesters can earn around US$ 288 per year, while rural craftsmen can earn around US$ 376. The rattan sector has potential to grow and continue providing a valuable source of revenue, however it is facing a number of difficulties - including unsustainable harvesting, a resource shortage around some villages due to over-harvesting and agricultural expansion, a lack of appropriate policy and regulatory frameworks, a lack of appropriate equipment, and poor processing techniques. These factors are all exerting pressure on the rattan resource. Such issues will need to be addressed if rattan production is to be put on a more sustainable* footing and its true development potential in Cameroon realised.



Some craftsmen showcase their rattan products near busy, major roads, making the most of the exposure this offers.

Rattan in Ghana

In Ghana, as in Cameroon, the two most important rattan species are *Laccosperma secundiflorum* and *Eremospatha macrocarpa*, but in this part of the world they are known as 'eyee' and 'mfia' respectively. Rattan canes* are collected predominantly from the south western part of the country, with the processing industries mostly located in and around Kumasi in the Ashanti region. About 60 per cent of the villages have road access between the rattan harvesting sites and the marketing centres. However, the remaining 40 per cent do not, and the harvesters have to carry their heavy rattan bundles to the nearest roads, which can be 8-10 km from the production sites.

Rattans were once found throughout the high forest zones of Ghana but forest degradation and over-exploitation of the species have since limited commercial quantities to the wet and moist evergreen* forests of the south west. Originally, rattans were only used on a subsistence level to produce the likes of rattan mats and ropes, but around 50 years ago, commercial rattan products like furniture began to be manufactured. The collection, processing and trading of rattan and rattan products now involves many thousands of rural and urban people throughout southern Ghana. Today, rural processors tend to produce mainly storage and carrying baskets, and fish traps for the local markets, while the urban processors produce items like furniture, book shelves, baskets, trays and various artefacts.

From raw material to finished products

After cutting the rattan canes, the harvesters generally clean away the sheaths and spines before arranging the stems into bundles of about 50-80 pieces (depending on the species). Given the strenuous nature of the work, and the weight of the 2-3 m long bundles, at around 30-35 kg each, it is hardly surprising that the harvesters are predominantly young males. Many of the rural harvesters return to their villages with their supplies, later making rattan products for sale. Other harvesters sell their cane to middlemen at the "forest gate", or pool their collection with several other harvesters, and sell to marketing centres. Sometimes urban processors directly hire harvesters to bypass the middlemen, reducing their costs and guaranteeing their supplies in the process. Before the processors can utilise the cane though, it needs to be dried in the sun or in kilns to reduce the moisture content (and to ward off insect attack and fungal disease).

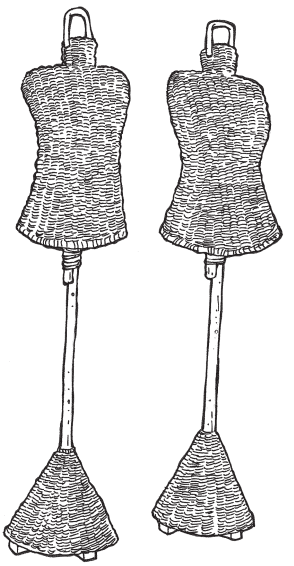
Thousands of minor and major players earn valuable income from harvesting, processing or trading rattan. The major rural rattan collectors generally carry out their harvesting around

other farming activities, earning up to US$ 350 per year. The major urban rattan processors tend to be involved on more of a full time basis, and good operators can potentially earn more than US$ 800 per year. The quantity of rattan products sold in markets and roadside stalls largely depends on the time of the year, with the busiest periods being Christmas, Easter and during the dry season.

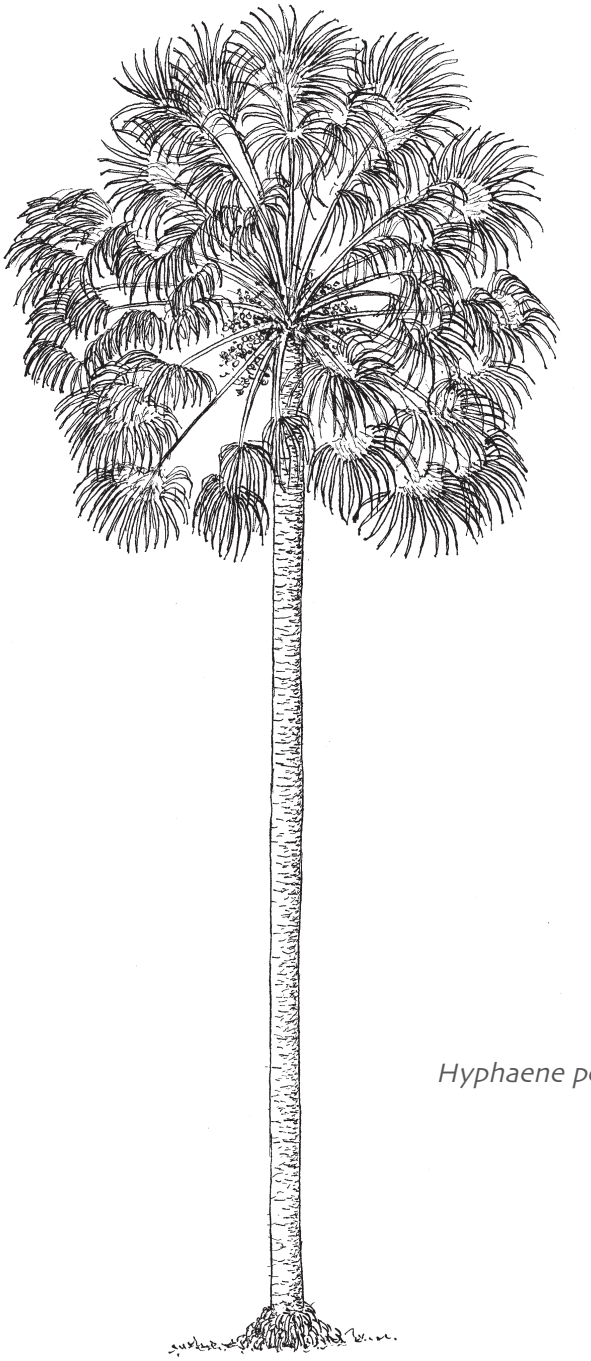
Trends

A combination of deforestation, excessive timber logging, and over-exploitation has greatly reduced rattan populations. As a result, many small scale rattan industries have been forced to close. Other consequences include considerable increases in the travel time for collection and the cost of raw material. Rattans are even being imported now from Liberia and Côte d'Ivoire. The survival of the industry in Ghana will depend on strict adherence to reduced impact logging* (RIL) techniques in areas where the concentration of rattan species is greatest, and also, the establishment of rattan plantations in old *Hevea brasilensis* and *Theobroma cacao* (rubber tree and cocoa) plantations.

Currently less than 50 per cent of rattan producers belong to rattan associations. The strengthening of these associations could assist with fostering unity and good relations among members, controlling raw material prices, regulating and encouraging sustainable harvesting* practices to protect existing wild stocks, and promoting rattan cultivation and plantations. If the necessary attention is given to the industry, it has the potential to continue contributing economically both regionally and nationally, and also, improving the livelihoods of those involved in collecting, processing and trading rattan.



Rural and urban buyers purchase different types of products, with the city markets tending to stock fancier items.



Hyphaene petersiana Mart.

Palm baskets

Zimbabwean case by Phosiso Sola

Weaving ilala: Palm leaves in communal areas of Zimbabwe

Have you ever noticed how many baskets of different shapes and sizes there are in most handicraft shops? In many African countries, the basketry industry has been experiencing growth, and in places like Botswana, Namibia and South Africa, basketry has become very important for people's livelihoods - providing both household items and a means of making a living. In the Sengwe communal area of South Zimbabwe, shangaan people have been utilising the palm *Hyphaene petersiana* for craft work and sap tapping for centuries. The young leaves are used for basket making, the dry petioles (palm frond stalks) for doors and chairs, and the fresh rachis (the frond stalk extensions, from which the leaflets arise) for mats. Women also use the fan leaves as thatching material and for weaving tablemats.

Craft production depends on leaf supplies, which in turn, depend upon palm densities and leaf production rates. In one of the Sengwe communal areas, an estimated 3300 leaves are harvested per hectare each year. Such a figure may sound high but fortunately under the local circumstances, this rate is sustainable* without leading to over-harvesting. *Hyphaene petersiana*, locally known as 'ilala', is a communally owned resource that grows naturally in large clusters, scattered across woodland* areas. In Zimbabwe, land in the communal areas is State-owned, with traditional leadership and local government as resource custodians. In Sengwe, the local shangaan people have access rights to tapping their local palm stands for sap, with these rights being passed down from father to son. Anyone in the community however, is able to harvest the palm leaves for craftwork.

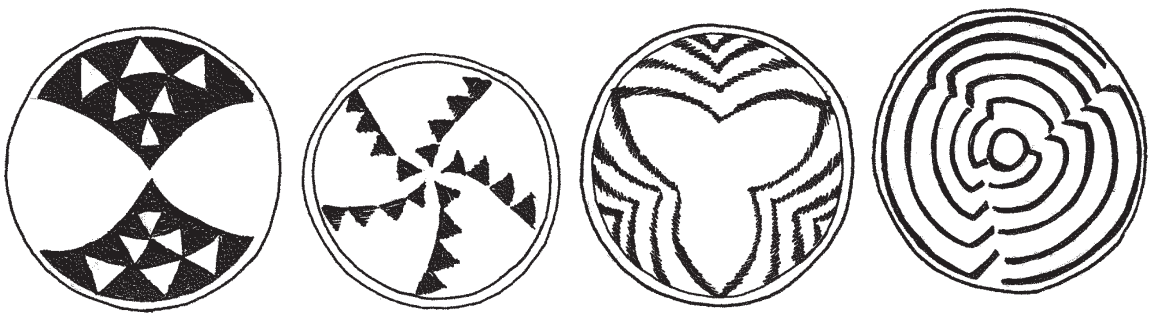


Plate-shaped baskets are coloured with natural dye. The bark of *Bechermia* trees is collected and ground (and sometimes mixed with charcoal to deepen the colour), before being added to palm leaves in boiling water.

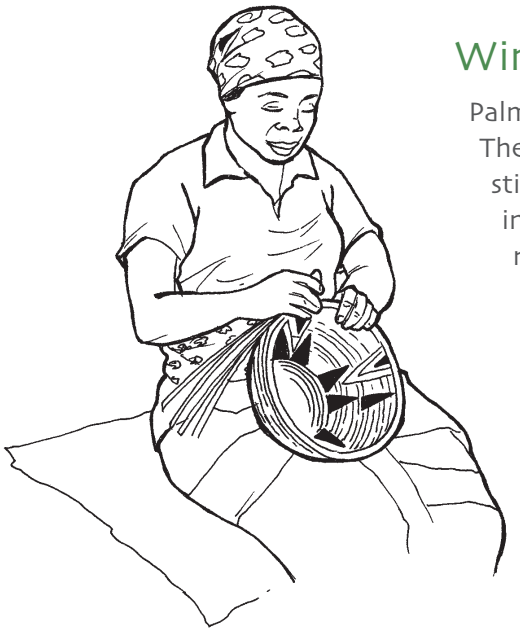
Each village has its own designated areas where tapping fields and also leaf harvesting areas are located. The village chief has overall control of palm utilisation, working through a head man, and to date, they have managed to stop the transportation and sale of unprocessed palm leaves. Traditional rules have helped to conserve the palms, even with everyone in the designated area having access to palm leaf harvesting.

Leaf processing and weaving

Family members carry out both leaf processing and weaving. Unopened leaves, consisting of many leaflets, are cut and opened for drying. The leaflets are split using a big needle, the midrib* is removed and the outer edges are discarded. Midribs are used as weft threads and weaving material for winnowing baskets, and as filling for shopping and fruit baskets. The big craft pieces (winnowing, harvest and washing baskets) are made from palm leaves of about 100 cm in length, while the smaller weavings, such as wall hangings, fruit baskets and sugar basins, are made from shorter leaves.

Harvesters collect material from female plants, which have dark green, pliable leaves that are well suited for craft making. Male plants on the other hand, have whitish-green leaves that are more brittle and therefore less suited to craft production.

Nearly two thirds of the items produced are sold for cash - either traded locally or collected by producer groups, graded and sold to the Sengwe Vanani Craft Association (SEVACA). This craft-trading organisation was established in 1997 with financial assistance from a German NGO called Terre des Hommes (TDH). About 60 per cent of commercial basket producers belong to this association. Before its establishment, basket quality was poor, the range was small, and production and income levels were low. Basketry was an activity that took place outside the main agricultural season, with most of the products being piled up in houses in case potential buyers passed by. Building the capacity of local people and linking the Sengwe community to outside markets has led to an increase in craft production and income levels. In 1998, craft producers earned an average US$ 14.80 per year, and the basketry industry accounted for about 20.5 per cent of the annual income of Sengwe households. A 2001 survey revealed that the average basketry earnings had increased to US$ 21.07. However, it is likely to have since declined again due to the country's current economic problems.



In Sengwe, most community members have participated at one time or another in palm related activities. The overall proportion of cash income generated from sales is around 8 per cent for men and 20 per cent for women.

Wine tapping

Palm sap tapping is the main competitive use of *H. petersiana* palms. The optimal season for tapping is between August and March, as stipulated by local rules and traditional technical knowledge (which indicates tapping in the cold season results in reduced output and retarded regeneration). It can take around three months for experienced tappers, mainly elderly men, to tap a ramet (palm stem). Each day, only a small amount of tissue is scraped off from the top (a maximum of 1 cm, with an average thickness of 0.5 cm). This is why tapping takes so long. A recovery period of three years is then required before the ramet can be tapped again. This period is shorter than for palms in other regions, as the Sengwe flood plains facilitate a faster recovery.

Tapping the sap prevents palm stems reaching flowering maturity. Apart from leaf material which is cut when the palm stems are prepared for tapping, leaf production ceases while the stems are being tapped. This reduces the availability of material to the basketry industry in the short term, but the repeated tapping actually maintains suitable small palms for basketry, and also increases the number of resprouting stems per clump.

Trends and issues

H. petersiana palms are not being over-harvested but there are other possible threats to the basketry industry, including population growth and land conversion. The Sengwe area used to have more palm veld* but much of it has been lost to agricultural fields. Human population growth also remains a key factor influencing the availability of palm resources, as it contributes directly to the rate of land use conversion, settlement and crop production.

The basketry industry that began as chance-sales by a few households has grown to encompass about 60 per cent of the Sengwe community. SEVACA, the locally based trading association, has facilitated the expansion of markets, which in turn, has increased community and household income levels. This demonstrates that with well directed support, community based industries can be viable.

Conclusions: The lessons learned

By Brian Belcher and Citlalli López

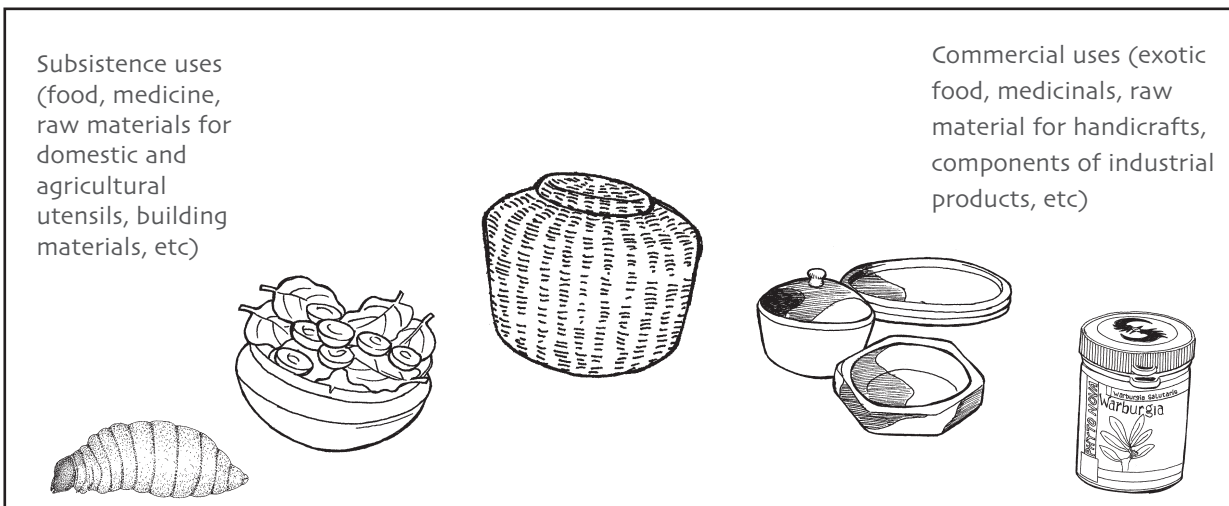
The cases within this volume demonstrate a great deal of variability, as well as some striking similarities. As such, they are valuable for what they teach us both individually and collectively. By comparing and contrasting different cases we can gain a greater understanding about the characteristics of small scale natural resource management, the broader socio-economic context and also, policies and interventions that may lead to successful outcomes or failures. This final chapter discusses some of the key issues and lessons learned about the value of forest resources, their sourcing and management, demand and supply, and fair and sustainable trade.

The value of forest resources for rural families

Rural livelihoods, especially in developing countries, are characterised by diversity. Households rely on the direct use of agricultural and forest goods as well as many different sources of cash income, generated from the sale of produce or wage labour. Three categories of households involved with non-timber forest products (NTFPs) can be identified according to the degree of household income earned in cash and the proportion generated by the trade of NTFPs.

- Households primarily relying on subsistence sources (direct use) of forest goods
- Households in which the commercial NTFP provides a supplementary source of income
- Households that earn most of their income in cash, from the sale of a forest product

The latter group tends to deal with products that have large and often international markets. Commercial value however, is not the only reason families conserve and manage forest resources. Many trees in Africa are rich sources of food, building materials and medicines. Particular trees may also give rise to different end products, which are used both commercially and in many other ways by local people, for instance in rituals or in terms of medicinal or domestic applications. Long-lived trees such as marula, which grows in southern Africa, can be a source of food, fuelwood, medicine, and income - in this case, when the fruits are processed into beer. Shea trees, the source of shea butter, have multiple uses too, as do bush plum trees, and *Afzelia quanzensis*, which is used in Kenya and Zimbabwe for woodcarving. Sometimes commercially important trees, like bitter cola, retain significant cultural values as well. When a baby is born a bitter cola tree is often planted and lifelong ownership is bestowed upon the infant. Bush plum trees can be a sign of either hospitality or hostility to visitors, while trees used for woodcarving in Zimbabwe (including *Afzelia quanzensis*) can indicate important ritual sites.



Forest products are used both to meet subsistence needs and to generate income

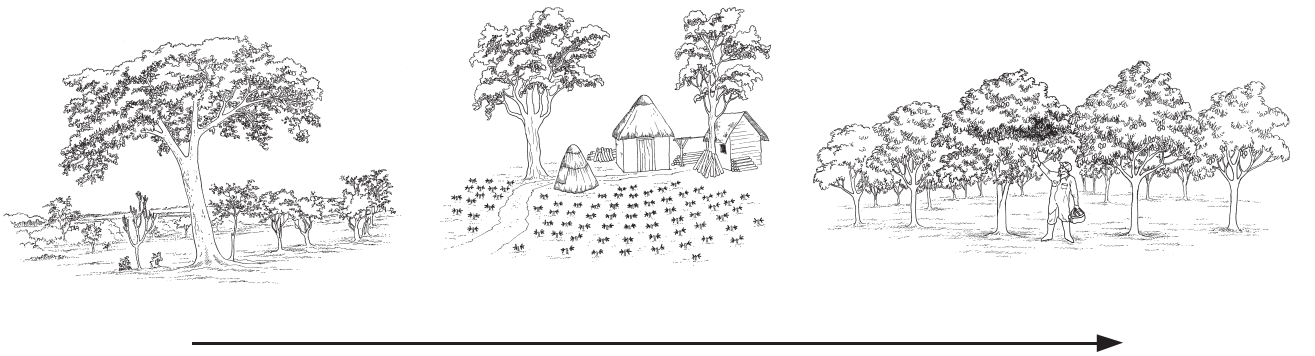
From where do our forest products come?

Forest resources not only come from forested lands, as we observe in a number of the cases, they are also found in home gardens, on agricultural lands and even in plantations. Around the world researchers have identified different approaches to forest resource management, ranging along a continuum from low to high intensity. At the high intensity end of the scale, there is a greater level of investment in terms of time and money, human labour, the use of agrochemicals* and special tools, etc. Along the management spectrum valuable species may be:

- Collected from wild populations, with no management
- Encouraged, protected and otherwise managed in natural forests
- Managed along with other useful forest species
- Tolerated (allowed to grow naturally and not weeded out) on agricultural lands
- Cultivated on agricultural lands in combination with other cultivars*
- Managed in small plantations
- Grown in large monoculture plantations

As the various cases illustrate, many African forest products are collected from the wild, and in contrast to Asia, there are far fewer examples of intensively managed forest species. Wood for chewing sticks in Ghana, UmMemezi cosmetic bark in South Africa, and food products like edible weevil larvae in Cameroon and bush meat in Ghana, are all hunted or collected directly from forests and traded in local markets. Products destined for the international marketplace, such as devil's claw root, and bark from *Warburgia* and *Prunus africana* trees (which are all used for pharmaceutical purposes), are also collected from the wild.

In a few of the cases in this volume, we observe that resources that were originally found in the forest are now being cultivated. In such cases farmers have patiently experimented, planting valuable species close to their settlements, on farms, in agroforestry* systems or in their home gardens. Shea trees are retained where they are found naturally growing in agricultural fields and near houses and regeneration is encouraged to boost natural stocks. Recently, due to market pressures and resource scarcity, farmers and researchers have begun experimenting with the planting of *Prunus africana* and



From low to high intensity resource management

Warburgia seedlings within agroforestry systems. Some other species, such as bush plum (*Dacryodes edulis*), have already been domesticated* and can be found growing in garden plots and on farms. To satisfy consumer tastes and supply larger quantities of products for burgeoning markets, farmers have, over time, modified the characteristics of certain species, like those of the bush plum. For example, by selecting or breeding to change the size, flavour or colour of the product, improve consistency or shift the fruiting period.

Harvesting, transporting and trading forest resources

Several cases in this volume show that harvesters may receive low levels of revenue, yet collecting forest goods can represent their most important source of cash income. For example, the harvesting of wood for chewing sticks in Ghana, palm leaves for basket weaving in Zimbabwe, and *Prunus africana* bark for medicinal purposes in Cameroon, provides the main form of income for many rural families. A number of the cases indicate that harvesting forest resources is often a seasonal activity which fits in around other work demands and largely depends upon the seasonal harvesting period, especially in relation to fruits.

In most cases it is the men who carry out the harvesting, although women and children are responsible for the collection of some forest products, such as marula, njansang and wild mango fruits. In South Africa, it is the women who collect UmMemezi bark to make cosmetic powder, an activity which often constitutes their main source of income. For rural families, the income generated from the sale of raw or manufactured forest products is used to meet daily subsistence needs or to cover important expenditures such as school fees or medical treatment. Some forest products provide valuable supplementary income in addition to agricultural or other income sources.

After harvesting, the resources need to be transported to their point of sale or processing. As with the old real estate motto, location is everything! The distance to markets, the availability of roads and the means of transport all influence whether and how producers market their produce. The harvesters' families or other local processors immediately process some forest products - especially those that are prone to spoiling and bulky or heavy products with a low value. Processing increases their durability and concentrates value. In several African cases, the harvesters undertake the processing themselves, especially when the requirements are quite simple and only call for the use of basic technology or tools. Products like UmMemezi bark, bush plums, njansang and wild mango fruits are processed into different products and sold directly to consumers in markets. A great number of women are involved in these processing phases, obtaining important income for their families.

When products require a higher level of transformation, the raw material is delivered to artisans or other workers, most of whom live in cities or near roadsides. The production of chewing sticks in Ghana provides a good example of this type of setup, as do woodcarving in Kenya and Zimbabwe, and the manufacture of rattan products in Ghana and Cameroon.

When it comes to selling forest goods, the products are moved to market individually on producers' backs, atop bicycles or motorcycles, or using available public transport. Sometimes forest products go directly from harvester to consumer, which can work well if the buyers want small volumes. For example, large amounts of bush meat and weevil larvae brochettes are sold in this way along busy roadsides. However, for many products this approach can disadvantage the sellers, who may be forced to accept low prices on a "take it or leave it" basis, particularly if they are far from home.

Instead, marketing is often organised by intermediaries, who purchase the products from harvesters and transport them to markets, larger traders or processing centres. Although such 'middlemen' are often seen as rural robbers, these traders frequently provide important services that are otherwise unavailable - like transport and marketing, loans against future production, and the provision of essential goods and information to remote villagers. Traders can also be important repositories of detailed knowledge regarding specific forest products. They often work hard to earn a modest profit while carrying a considerable share of the risk - prices may fall by the time the product reaches market, a proportion of the shipment may spoil or the whole lot may be confiscated by forest guards.

What happens when demand and supply change?

Over time, the demand for forest products has expanded within Africa and also in other parts of the world, especially in Europe, North America and Japan - largely due to companies tapping into the organic goods market in search of ingredients for the likes of beauty and pharmaceutical products. A number of the cases document an increased demand for products, particularly where an international market has developed or expanded. Some products, such as *Prunus africana*, *Warburgia* and devil's claw, are largely traded outside their production areas. The trade in bush plum, shea butter and bitter cola has also extended beyond local and country borders. The individual cases show that when demand increases, changes take place in terms of harvesting, processing and marketing practices.

A rise in demand stimulates producers to pursue various strategies to increase production. With wild resources, harvesters first intensify their collection practices. Especially when there is "open access" to forest (i.e. the unrestricted use of resources, with no effective property rights) and different harvesters compete to obtain the same forest products, there is a tendency for harvesting methods to become ever more destructive. This has been observed in relation to the felling of trees in places like Zimbabwe, where wood is collected for carving, in Ghana where chewing sticks are produced, and in South Africa, where kiaat wood is obtained for making handicrafts. In the cases of *Prunus africana* and *Warburgia* trees, their respective barks, which are valued as pharmaceutical ingredients, are being over-harvested, and in the case of devil's claw root, another source of medicinal components, entire plants are being uprooted. However, in all such cases, these practices limit the species' ability to regenerate and reproduce, leading to a reduction of future supplies. Similarly, due to competition or scarcity, immature specimens may be gathered, even when they do not attain the best market prices. When resources become extremely depleted in a given area, harvesters may then begin traveling long distances to more remote locations in search of new supplies.

Pressure over resources
Harvesting techniques
Resource management

Changes in processing technology
Division of work
Quality and quantity of production
Transporting and marketing

When demand for a forest product increases, many changes can occur in relation to harvesting, processing and marketing

Traditional rules have often provided guidance over access rights and have helped to protect resources. However, in situations of conflicting claims (e.g. between the State and communities) or as demand and prices for forest products increase, traditional rules can break down. To address the issue of over-exploitation and ensure a continued supply, farmers may intensify the management of valuable species. Together, a number of factors favour the process of domestication: significant demand, high market prices, secure tenure and appropriate ecological conditions.

Increased demand often leads to the specialisation of tasks. Sometimes this involves the abandonment of traditional manufacturing methods in order to produce larger quantities - and this can result in lower quality end products and lower market prices (as in the case of woodcarving in Kenya and Zimbabwe). In some cases, the processing takes place outside the original country where the forest product is collected. This is the case for forest goods that are processed into pharmaceuticals in Europe and the United States of America, and for commodities like shea butter, which is manufactured from shea kernels and used in skin care products.

Contrary to what most consumers would imagine, growing demand for forest goods does not always result in improved incomes for rural collectors, processors or traders. In fact, sometimes conditions for the rural poor may even worsen. Increasing demand and more profitable commercialisation can:

- Diminish the supply of and access to forest products for families who depend on forest goods for their own use or for sale
- Result in diminished resource access for small farmers who lack control or ownership over land and/or resources, shifting access to more powerful individuals or groups who have land rights and capital to invest
- Favour domestication efforts which involve not the original forest-based producers but a new set of producers with greater access to agricultural land and planting technologies

Fair and sustainable trade of forest goods

Due to the complexity and potentially negative impacts for small producers, plans to enhance commercialisation or intensify the production of forest goods need to bear in mind the wide range of potential impacts. Forest products are often sourced unsustainably, or their value is inequitably shared among the many people involved in their collection, processing and trade. Working to promote ecological sustainability and fair trade, international and national organisations have established several initiatives over the last two decades - including certification and the formulation of forest conservation policies.

Certification is a procedure whereby a written assurance is given that a product, process or service conforms to certain standards. For instance, several non-timber forest products, such as Brazil nuts and palm hearts, have been certified in Brazil and Mexico. However, very few harvesters overall have access to the financial resources or organisational framework necessary to pursue certification. Programmes for certification have mainly been developed for timber and agricultural products but four main categories are relevant to forest products as well, and consumers may encounter these kinds of labels when making purchases:

- Environmental - e.g. the Forest Stewardship Council (FSC) promotes ecological sustainability as well as socially responsible forestry
- Health - e.g. the International Federation of Organic Agriculture (IFOAM) focuses on the avoidance of exposure to, and contamination by, chemical pesticides and fertilisers
- Social - e.g. the Fairtrade Labelling Organisations International (FLO) aims to ensure that there is a fair and equitable distribution of benefits to producers
- Quality - e.g. the International Organization for Standarization (ISO) and Good Manufacturing Practices (GMP) formulate international product standards and encourage quality assurance

In addition to efforts by non-governmental organisations such as those outlined above, many countries have formulated national policies for the conservation of biological diversity, including forest resources. The United Nations Convention on Biological Diversity (CBD), adopted in 1992,

affirms that States have sovereign rights over their own biological resources, and provides a broad legal framework to structure access and benefit-sharing agreements. Since the management and use of many commercial forest products is based on indigenous knowledge, such agreements have been particularly relevant for the conservation of genetic forest resources and the protection of intellectual property rights.

Building the knowledge base

As the various case studies illustrate, it is critical that forest goods are recognised and valued not only for their short term economic benefits, but also for their cultural richness and the sustenance that they offer to tens of millions of rural and urban families worldwide. For centuries, non-timber forest products have played vital subsistence roles and this continues to be the case in developing countries. A range of products with commercial potential, as we have seen, also provide important sources of family income - for those with few other choices, as well as for those with access to capital or land and the initiative to further market or commercialise a particular product. The ability of a given resource to continue meeting both subsistence and commercial needs however, largely depends upon sustainable* harvesting and management practices. Access to information to assist with things like resource management, equitable access, income sharing, product development and marketing can be an important part of this process - and can help to ensure a longer term future for both the forest products and the people who depend upon income generated from their collection, processing and trade.

Research, such as that carried out in the course of compiling this volume, helps us to better understand and appreciate the importance and roles of forest products, and some of the factors that lead to positive or negative outcomes for resources and forest people. It is hoped that the lessons learned will add to the growing knowledge base about forest products and that this information can contribute to government and development policies, a general raising of awareness amongst consumers and also importantly, that it can filter back to the communities involved in the commercialisation of forest products, enhancing the traditional knowledge and skill base. Such information can better equip communities to improve their livelihoods in an environmentally sustainable manner - tapping into the riches of the forest in ways that can meet both short term and longer term subsistence, commercial, cultural and conservation needs.

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Glossary

The use of scientific names

At the start of each case in this volume you will have noticed the scientific names of the different forest plants (and animals) that are profiled. Biological classification helps us to understand the natural world and structure our knowledge. It enables people to identify and record species, providing a universal language of communication and serving as an important tool in nature conservation.

Each different species has a scientific name, which is a Latin binomial (or two-part name). This consists of a genus, followed by a species name and the name or initials of the person (or people) that published the first scientific description of that species (e.g. *Garcinia kola* Heckel). When it comes to naming plants, the system of 'botanical nomenclature' is used to distinguish and identify different types of plants. There are a number of reasons for this:

1. Universal Recognition

A plant can be identified in any country around the world using its botanical name - overcoming the barrier of different languages.

2. Relationships

Plant relationships can easily be determined by examining the botanical classification.

3. Identification
Common names are problematic and vary between districts. For instance, the name 'acacia' (wattle) could refer to any of the 1500 or so species of *Acacia*. A botanical name on the other hand points to one specific type of plant.

4. Origins
The origins of the plant can be established by looking at the name. For example, indicating if it is a hybrid (i.e. the offspring of two different plant species or varieties).

Genus
Genus names are always written in italics and begin with a capital letter (e.g. *Acacia*). They may be derived from the name of a famous botanist or from classical Latin names relating to the relevant plant. Alternatively, they may be Latinised forms of more common names, drawing on languages like French or English.

Species
This level consists of a general epithet or genus name and a specific epithet or species name (e.g. *Sclerocarya birrea*). The species name distinguishes exactly which plant is being referred to within a given genus. Species names are always written in italics, using lower case letters, and are usually descriptive. For example, they may provide clues to a plant's origins (e.g. *Pterocarpus angolensis* = from Angola). They may describe the plant or animal (e.g. *Tragelaphus scriptus*: Tragos (Greek) = a he-goat; elaphos (Greek) = a deer. In combination, the term refers to a type of antelope. Scriptum (Latin) = "something written", referring to the white coat markings). Or they may signify that a particular plant or animal is named after someone (if the species name has the suffix -i or -ii. e.g. *Cassipourea flanaganii* is named after Henry George Flanagan, a nineteenth century South African plant collector).

Subspecies
Sometimes within a species there is significant variation but not enough to assign another species. In this instance, the classification 'subspecies' is used. Subspecies names are always written in italics, using lower case letters, and like species names, are often descriptive (e.g. *Harpagophytum procumbens* ssp. *procumbens*).

Varietas (Variety)
Sometimes within a species (or subspecies) there is moderate variation, requiring the more subtle classification of 'varietas' or 'variety'. Varietas names are always written entirely in lower case italics and again, are often descriptive (e.g. *Prunus americana* var. *lanata*).

Agrochemicals - Agricultural chemicals, including fertilisers, pesticides, etc.

Agroforestry - Diverse farming systems whereby trees are integrated with crops to increase production and also, the social and environmental benefits.

Agro-industrial - A combination of agricultural and industrial elements, as in oil-palm plantations.

Agro-pastoral Activities - Agricultural and pastoral activities, including the growing of crops and the raising of livestock.

Amino Acids - A group of organic compounds containing an amino group and a carboxyl group. Twenty different amino acids are considered as the building blocks from which proteins are formed.

Anti-microbial - A substance which inhibits the growth of, or even destroys, microbes (micro-organisms, some of which are disease causing). Such substances are used in the treatment of microbial infection.

Apartheid - Racial segregation (a term particularly related to past practices in South Africa).

Arabic Gum - A latex fluid that is extracted from the stems of Acacia species for various applications (including industrial use and export). It can be used fresh as a binding material and when dry, as a chewing gum.

Biodiversity - Biological diversity. The variety of life in all its forms, levels and combinations - including ecosystem diversity, species diversity, and genetic diversity.

Bushbucks - Large mammals (*Tragelaphus scriptus*) which belong to the Antelope family, and are popular in the bush meat trade.

Buttressed/Buttress Roots - Flattened extensions of tree trunk and above ground roots, which grow out from the main trunk to support and stabilise a tree. Found in certain (often shallow rooted) trees, especially in rainforest areas.

Calabash - A container or vessel made from dried gourd shells.

Canes - The long, hollow or pithy, jointed stems of certain plants, like rattan, bamboo and sugar cane.

Chew Sticks - The green, split stems of certain woody plant species, which are chewed to maintain good dental health (especially in West Africa).

CITES - The Convention on International Trade in Endangered Species of Wild Fauna and Flora. This international agreement between Governments aims to ensure that international trade in wild animals

and plants does not threaten their survival. CITES works by subjecting international trade in specimens of selected species to certain controls. Authorisation through a licensing system is required for species covered by the Convention. These species are listed in three Appendices according to the degree of protection needed.

Coppice - The sprouting of shoots arising from woody stumps or the underground roots of parent plants.

Crown - The uppermost layer of foliage on a tree or in a forest, through which filtered light reaches the understorey trees and plants below.

Cutlasses - Short, heavy, slightly curved swords, which are sometimes used in the harvesting of plants or plant products.

Dispersal of Seeds/Disperse - The distribution of seeds from the parent plant by carriers such as the wind, water, birds or animals, or by other means.

Domesticated - The process by which formerly wild plants or animals are retained or integrated into farmland systems or home gardens, sometimes involving selective breeding over many generations to improve desirable characteristics for human benefit.

Drought Resistant - Hardy plants or trees that can withstand a shortage of water and difficult environmental conditions for a period of time during dry and drought periods, usually as a result of special adaptations.

Duikers - Small antelopes (*Sylvicapra* spp. and *Cephalophus* spp.) which inhabit forest or dense bushland and are one of the most highly favoured bush meat species, for both subsistence needs and the commercial trade.

Ecologically Sustainable - The gathering of plants or plant products in a way that does not jeopardise the reproductive capacity or regenerative potential of a particular species within a given area (and which does not have a detrimental impact on the surrounding ecosystem of living organisms and their environment).

Ecology - The study of the interactions of organisms with their physical environment and with one another.

Ecosystem - A community of living organisms interacting with each other and the physical environment in which they live.

Ecotones -The boundary of a transitional zone between adjacent communities or biomes (major, regional ecological communities characterised by distinctive life forms and principal plant or animal species).

Evergreen - Trees and shrubs that retain living leaves throughout the year. The leaves of the past season are not shed until the new foliage has been completely formed. This contrasts with deciduous plants, which lose their leaves during a certain season.

Exotic - Species of plants or animals that are not indigenous or native to a particular area. That is, they have been introduced from foreign locations or countries. (See also 'Introduced species')

Extinct - Without a living representative, as in 'species extinction'. 'Locally extinct' relates to the loss of a species within a particular area.

Grass-cutters - A type of rodent known as a 'cane rat' (*Thryonomys* spp.). These small mammals are popular in the bush meat trade, particularly in West and Central Africa. Their meat has a higher protein but lower fat content than domesticated farm meat and is appreciated for its tenderness and taste.

Habitat - The environment of an organism or species; the place where it is usually found living.

Habitat-specific - A species that requires or prefers a particular kind of habitat or environment in which to live, breed or obtain certain types of food.

Hardwood - Woody tree species belonging to the 'dicot' class of angiosperms (or flowering plants) - characterised by having two seed leaves, net veined leaves and flower parts usually in multiples of fours or fives. Hardwoods often, but not always, have hard wood.

Headloads - Goods, like firewood or fruits, which are carried, often in baskets, upon the head.

Host-plant - A plant from which a parasite (or other organism, like a fungus or insect) obtains nutrition and/or lives on. Or, a plant or tree which another plant uses for structural support (e.g. as in the case of rattan).

Indigenous - Originating in or characterising a particular region or country, native to an area.

Introduced Species - The introduction of plants, animals or other living organisms from foreign locations or countries, into a region where they were not formerly found naturally living or growing; species that are not indigenous or native to a particular area. (See also 'Exotic species')

Midrib - The central or middle vein of a leaf.

Monoculture - The use of land for growing only one type of crop.

Montane Forest - The lower section of vegetation in mountainous regions, which extends to the tree line (the natural border or point at which tree growth becomes less common). This cool, moist upland habitat is dominated by evergreen trees.

Non-pastoral Areas - Areas where pastoral activities (like tending livestock) do not take place, for reasons such as extreme aridity, remoteness, or urban/semi-urban development.

Pangolins - Nocturnal mammals (*Manis* spp.) that are similar to anteaters, but are covered in armour-plated scales. These animals have a specialised diet of ants and termites and are a popular species in the bush meat trade.

Parasitic Mistletoe - A type of plant (belonging to the Loranthaceae Family) which lives on, and obtains nutrients from, a host tree.

Phytosanitary - Relating to the conditions affecting the health of plants, especially in terms of cleanliness and the exercising of precautions to reduce the incidence of disease.

Propagate - The process of breeding or assisting plants, animals, etc to naturally reproduce from parent stock. Or the process of growing new plants from seed, cuttings or even tissue samples.

Protozoal - Relating to organisms, often very small or microscopic, belonging to the phylum Protozoa - which is comprised of animals consisting of one cell, or colonies of similar cells.

Reduced Impact Logging (RIL) - A set of practices which seeks to lessen the impact of logging and includes factors such as: reducing logging intensity; practicing directional felling; selecting trees for harvesting in a discerning manner; carefully planning skid trails, roads and log landings to cause minimal disturbance; and winching logs on to trails.

Ringbarking - Cutting away the bark in a ring around a tree trunk or branch - a practice which can kill the affected area or even the entire tree.

Rooted Cuttings - Cuttings, usually small sections of stem, which have been taken from a plant or tree and propagated - grown in a solution or soil, until new shoots and roots appear. Once established, such cuttings can be transplanted.

Savanna/Savanna Grassland - A grassland region with scattered trees, grading into either open plains or woodlands, usually in subtropical or tropical areas.

Secondary Forest - Forest regrowth following significant disturbance of the original vegetation. The new growth often differs in forest structure and species composition compared to primary forest (i.e. mature, old growth forest).

Semi-deciduous - Plants that shed some of their leaves in a particular season (often during dry or cold periods) or at a certain stage of growth.

Semi-domesticated - Neither wild nor fully domesticated. A partial state of domestication - the process

whereby plants or animals become integrated into farming systems or home gardens, often involving selective breeding to improve desirable characteristics.

Shade-tolerant - A plant or tree that can live and grow in the shade of taller plants and trees, or beneath other structures which reduce the level of light they receive.

Stolon - A slender shoot, usually in the form of a horizontal stem or runner, which can take root and eventually develop into a new plant.

Sustainable/Sustainably - see 'Ecologically Sustainable'

Sustainable Extraction/Harvesting - The gathering of plants or plant products in a way that does not jeopardise the reproductive capacity or regenerative potential of a particular species within a given area.

Sustainable Management - The implementation of management or harvesting guidelines to foster the regeneration of a species in a given area. Measures are put in place to ensure that the extraction of a particular type of plant or animal product does not adversely affect the ability of the remaining stocks to recover.

Sustainable Supplies - Supplies that are obtained in a manner which does not jeopardise the regenerative potential of the resource that they are drawn from. That is, harvesting is in balance with the productive capacity and hence over-exploitation does not occur.

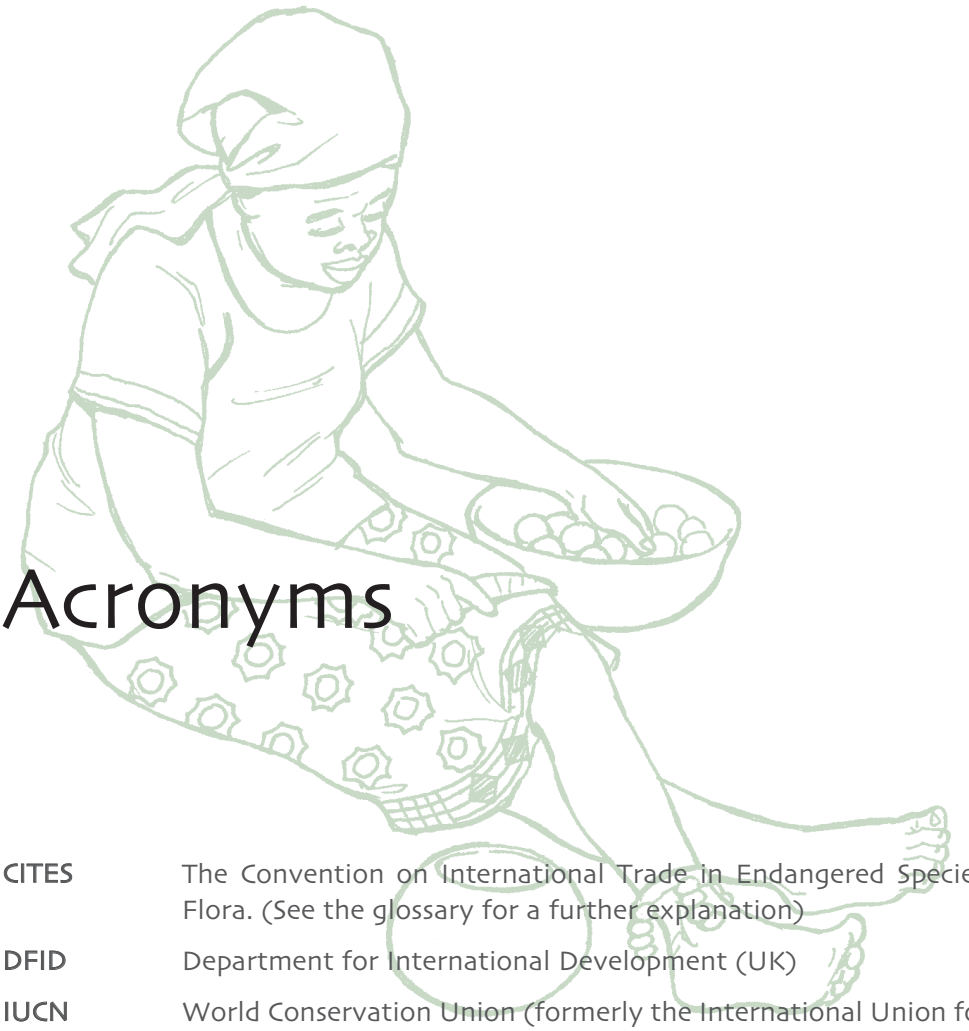
Tuber - An enlarged, fleshy underground stem (such as that of the potato); usually an oblong or rounded thickening or outgrowth.

Understorey - Plants growing under the canopy of taller plants or trees.

Veld - Thinly forested or open country, bearing grass, bushes or shrubs; characteristic of parts of southern Africa.

Water-storing Secondary Roots - Roots that branch from larger, older roots or the primary root, in which water is stored (often as an adaptation to facilitate survival in arid conditions).

Woodland - An area of vegetation dominated by a more or less closed stand of short trees; an intermediary area between grassland and forest.



Acronyms

CITES	The Convention on International Trade in Endangered Species of Wild Fauna and Flora. (See the glossary for a further explanation)
DFID	Department for International Development (UK)
IUCN	World Conservation Union (formerly the International Union for the Conservation of Nature)
NGO	Non-Government Organisation
NTFPs	Non-timber forest products
SAFIRE	Southern Alliance for Indigenous Resources
SEVACA	Sengwe Vanani Craft Association (a craft trading organisation operating in Zimbabwe)
TDH	Terre des Hommes (a German NGO operating in Zimbabwe)
UNESCO	United Nations Educational, Scientific and Cultural Organization
WWF	World Wide Fund for Nature (formerly the World Wildlife Fund)

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Source material used for the illustrations

Front cover	*Pterocarpus angolensis*, based on photos by Piet Van Wyk, published in Van Wyk, B. and Van Wyk, P. (1997) Field guide to trees of southern Africa. Struik, Cape Town. African woman, based on a photo by Kathrin Schreckenberg, Overseas Development Institute (ODI), London
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Page 30 Based on a photo by Kathrin Schreckenberg, ODI London

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Page 33 *Prunus africana*, redrawn from a botanical illustration by Margaret Stone, published in Beentje, H. (ed.) Flora of tropical east Africa. Royal Botanic Gardens, Kew.

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Page 37 *Cassipourea flanaganii*, redrawn from a botanical illustration by Tony Dold, Selmar Schonland Herbarium

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Page 41 *Warburgia salutaris*, redrawn from a botanical illustration by Fay Anderson, published in Gelfand, M., Mavi, S., Drummond, R.B., and Ndemera, B. (1985) The traditional medical practitioner in Zimbabwe. Mambo Press, Harare.

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Page 45 *Harpagophytum procumbens*, based on photos by Rachel Wynberg

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Page 57 *Pterocarpus angolensis*, based on photos by Piet Van Wyk, published in Van Wyk, B. and Van Wyk, P. (1997) Field guide to trees of southern Africa. Struik, Cape Town.

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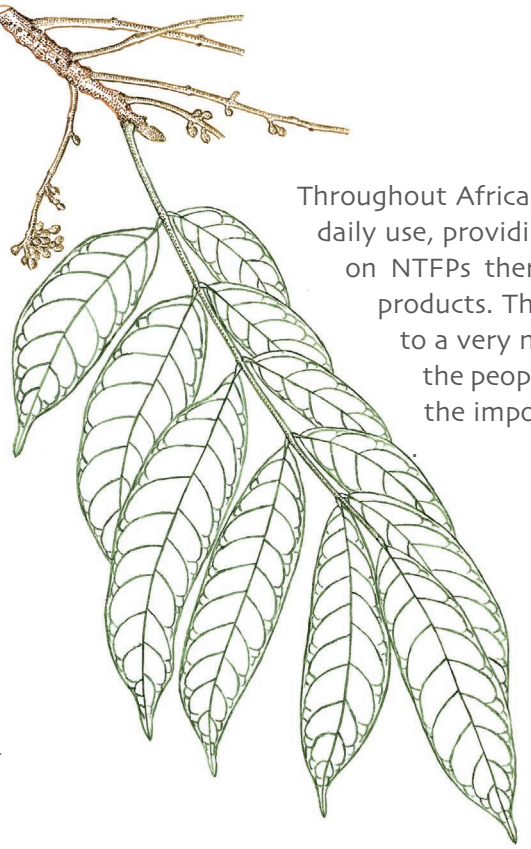

Throughout Africa, non-timber forest products (NTFPs) such as plants and bush meat are in daily use, providing crucial resources for local livelihoods. Despite research that has focused on NTFPs there is still a lack of knowledge regarding the importance of these forest products. The research that has been conducted has been targeted and communicated to a very narrow audience. This book is a rare and valuable exception. It brings to life the people and products behind the research, communicating in a very readable way, the importance of "green social security".

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