Forest Products, Livelihoods and Conservation

Case Studies of Non-Timber Forest Product Systems

VOLUME 2 - AFRICA

Editors
Terry Sunderland and Ousseynou Ndoye

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Office address: Jl. CIFOR, Situ Gede, Sindang Barang,
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Tel: +62 (251) 622622
Fax: +62 (251) 622100
E-mail: cifor@cgiar.org
Web site: http://www.cifor.cgiar.org

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ANIMAL PRODUCTS

Contributors

Atilade Akanmu Adebisi
CENRAD
P.M.B. 5052
5 Akinola Maja Street
Jericho Hills, Ibadan
Nigeria
E-mail: cenrad@mail.skannet.com;
cenrad@ibadan.skannet.com

Hassan Gbadebo Adewusi
Department of Forest Resources
Management
University of Ibadan
Nigeria
E-mail: ajilete@hotmail.com

Charles Adu-Anning
Department of Agroforestry
Institute of Renewable Natural
Resources
Kwame Nkrumah University of
Science and Technology
Kumasi
Ghana
E-mail: canning@forig.org;
canning_01@yahoo.com

Michael B. Balinga
African Rattan Research Programme
c/o Limbe Botanic Garden
P.O. Box 437, Limbe
Cameroon
E-mail: mpbalinga@yahoo.fr

Dominic Blay
Forestry Research Institute of Ghana
University Box 63, Kumasi
Ghana
E-mail: dblay@forig.org

Ivan Bond
World Wide Fund for Nature
(Southern Africa Region
Programme Office)
Almond Tree Cottage
Long Wittenham Road
North Moreton, Nr Didcot
Oxon OX11 9AZ
United Kingdom
E-mail:
leebee@atcottage.freeserve.co.uk

Oliver Braedt
Federal Research Centre for
Forestry and Forest Products (BFH)
Leuschnerstrasse 91
D-21031, Hamburg
Germany
E-mail: braedt@holz.uni-hamburg.de

Simon Kosgei Choge
Kenya Forestry Research Institute
PO. Box 20412, Nairobi
Kenya
E-mail: skchoge2002@yahoo.com;
kefri@arcc.or.ke

Michelle Cocks
Institute of Social & Economic Research, Rhodes University
P.O. Box 94, Grahamstown 6140
South Africa
E-mail: M.Cocks@ru.ac.za

Anthony B. Cunningham
People and Plants Initiative
84 Watkins Street
White Gum Valley, Fremantle
Australia
E-mail: peopleplants@bigpond.com

Louis Defo
University of Leiden, WOTRO Ph.D fellowship programme
P.O. Box 8297 Yaounde
Cameroon
E-mail: defotls@yahoo.fr

Mercy A. Dione
University of Buea
SW Province
Cameroon

Tony Dold
Selmar Schonland Herbarium
Rhodes University
P.O. Box 94, Grahamstown 6140
South Africa
E-mail: T.Dold@ru.ac.za

Dale Doré
SHANDUKO: Centre for Agrarian and Environmental Research
195 Fife Avenue, Harare
Zimbabwe
E-mail: daledore@zol.co.zw

Susan Tarka Harrison
Department of Botany
Natural History Museum, London
Cromwell Road
London SW7 5BD
United Kingdom
E-mail: tarkaharrison@yahoo.com

Tata Precillia Ijang
Ministry of Scientific and Technical Research in Cameroon
Institute of Agricultural Research for Development, Dschang
c/o Presbyterian Church Dschang
P.O.Box 353 Dschang
Cameroon
E-mail: ijang2001@yahoo.fr

Nouhou Ndam
Limbe Botanic Garden
P.O. Box 437, Limbe
Cameroon
E-mail: Lbg@bifunde.com; Lbgmcp@camnet.cm

Ousseynou Ndoye
CIFOR Cameroon
c/o IITA Humid Forest Station
B.P. 2008, Yaounde
Cameroon
E-mail: o.ndoye@cgiar.org

Joseph Obua
Department of Forest Biology and Ecosystems Management
Faculty of Forestry and Nature Conservation, Makerere University
P.O.Box 7062, Kampala
Uganda
E-mail: obua@forest.mak.ac.ug

Patrick Omeja
Faculty of Forestry & Nature Conservation
Makeree University
PO. Box 7062, Kampala
Uganda
E-mail: omejap@hotmail.com

Kathrin Schreckenberg
Forest Policy and Environment Group, Overseas Development Institute (ODI)
111 Westminster Bridge Road
London SE1 7JD
United Kingdom
E-mail: k.schreckenberg@odi.org.uk

Charlie M. Shackleton
Environmental Science Department
Rhodes University
Grahamstown, 6140
South Africa
E-mail: c.shackleton@ru.ac.za

Sheona Elizabeth Shackleton
Environmental Science Department
Rhodes University
Grahamstown 6140
South Africa
E-mail: s.shackleton@ru.ac.za

Phosiso Sola
SAFIRE
10 Lawson Ave, Milton Park
Box BE 398 Belverdere, Harare
Zimbabwe
E-mail: afpc2a@bangor.ac.uk;
sola@safire.co.zw

Wavell Standa Gunda
Center for International Forestry
Research
Regional Office for Eastern &
Southern Africa
73 Harare Drive
Mt. Pleasant, Harare
Zimbabwe
E-mail: w.standa@cgiar.org

Terry C.H. Sunderland
African Rattan Research Programme
c/o Limbe Botanic Garden
P.O. Box 437, Limbe
Cameroon
E-mail: afrirattan@aol.com;
TCHSunderland@aol.com

Mahop Tonye Marcelin
PhD student Queen Mary College
University of London
E-mail: tonyemah@yahoo.com

Rachel Wynberg
Graduate School of Environmental
Studies
University of Strathclyde
P.O. Box 83, Kalk Bay 7990
South Africa
E-mail: rachel@iafrica.com

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Foreword

His Excellency, Henri Djombo
Minister of Forest Economy
and the Environment of the Republic of Congo

President of the Conference of Ministers in Charge of Forests of
Central Africa (COMIFAC)

Several authors have highlighted the importance of Non-Timber Forest Products (NTFPs) in the livelihoods of forest dwellers in Africa. These products, namely fruits, nuts, leaves, barks, cane and bushmeat in particular, have been used for centuries as food and medication by African forest dwellers.

The collection and sale of NTFPs is mainly the activity of poor populations and small traders. As a result, any action aimed at developing the NTFP sector will contribute to poverty alleviation in the same way as it does to the development of the agricultural sector.

The economic crisis of the 1980s in Africa, which resulted in the decline in the profitability of cocoa and coffee production on the international market, prompted the majority of farmers to diversify their sources of income by collecting and selling NTFPs in order to minimize the risks related to agriculture. The economic potential of NTFPs for poverty alleviation is very high compared to traditional cash crops such as coffee and cocoa. Research by the Center for International Forestry Research (CIFOR) has shown that the prices of certain NTFPs could compete with those of cocoa and coffee.

The lack of harmonization of the methodological approaches used in the past did not allow for a comparison of the case studies carried out on NTFPs in various parts of the continent and between Africa and other continents. CIFOR took an unprecedented step by initiating the project on World Comparison of NTFPs, financed by DFID. This project is based on 61 case studies, including 17 in Africa. The lessons learnt from the project were very beneficial to the researchers involved, and put their case studies in a global perspective. It is certain that in Africa, researchers who work on NTFPs do so in isolation. This does not enable them to exchange or learn from other researchers in the same field. The CIFOR project allowed various researchers

involved to interact for the first time, especially during workshops organized on each continent, and through the web sites created for this purpose.

There is no doubt that this volume, which is devoted to Africa, will help in guiding investments and decision making on NTFPs in the continent for years to come. This volume highlights the important role of NTFPs in the well being of millions of Africans, and it is also the basis of a plea to African governments to work together towards securing the access and property rights of populations. It also indicates the need to improve the performance of markets with a view to intensifying and diversifying viable local economies that have strong bases in national and regional networks. This will contribute to the emergence of a situation where forest resources will be preserved and the livelihoods of populations will be improved (a win-win situation). In my opinion, this intensification and diversification would be attainable in a sustainable way if the domestication of NTFPs were carried out at the same time and on a large scale, thus allowing rural communities to integrate trees into their farming systems.

The publication of this volume is very timely as COMIFAC, CEFDHAC and other sub-regional organizations plan to organize important meetings in 2004.

Foreword

J.E. Michael Arnold

Products other than timber and other industrial roundwood have always constituted a large part of the forest economy in developing countries. Individual products provide inputs and income directly to huge numbers of rural and urban households. In many countries the aggregate of non-timber forest products (NTFPs) contributes as much, if not more, to national product as industrial roundwood. However, their designation as 'minor' forest products reflects their relative neglect until quite recently. Produced and consumed largely outside the monetary economy, they attracted only limited attention and even less in the way of measurement and research.

The recent increase in interest in NTFPs has been a consequence of a number of shifts in developmental focus. With the evolution in thinking about the importance of rural development and poverty alleviation has come growing interest in how forests and forest products contribute to households' food and livelihood security. Within this framework forest product activities have begun to attract particular attention as being often one of the larger income-generating components of the non-farm part of the rural economy. In recent years this interest has been reinforced by shifts in development policy and strategy towards more market driven activity within this part of the economy.

At the same time, concerns that development activities be consistent with environmental integrity, and not prejudice the future potential of forest and land resources, have highlighted arguments that managing them for NTFPs might be less environmentally damaging than alternative uses of forests. In addition, the policy shifts that encourage devolution of control and management away from central governments to local institutions have drawn more attention to NTFPs as a potentially important incentive to local forest management.

However, the state of knowledge about these aspects of NTFP activities has not kept pace with this emerging and evolving perception of their

increased importance. Though quite a lot is known about the characteristics of many individual products, much less is known about their commercial performance and developmental linkages. Consequently, we are still at a quite early stage in the process of establishing general patterns of NTFP activity that could help us understand the factors that determine the circumstances in which they are or are not likely to be commercially successful and appropriate.

This knowledge is so rudimentary not only because of the low priority attached to NTFPs in the past, but also because of the complexities of researching and understanding such a highly diverse group of products, produced in such a wide range of different ecological and socioeconomic situations. Some are generated within predominantly subsistence livelihood systems, in order to generate the limited amounts of cash income needed to fill seasonal gaps or tide households over hard times. Others form part of livelihoods that are integrated into the market economy, and can form important and growing sources of household income and improvement. Many NTFPs are goods that fall out of use as incomes rise, or that can no longer compete when more efficiently produced alternatives become available in their markets. Others, in contrast, face expanding markets and generate attractive returns. Consequently greater exposure to market forces may disrupt or even overwhelm some NTFP trades, while offering new or expanded opportunities for others. It is therefore important to understand more precisely the factors that shape such possibilities and threats, in order to be able to identify what types of intervention might encourage the one, or help avert or alleviate the other.

There are also different scenarios to be considered on the supply side. Some NTFPs are extracted from existing 'wild' resources, others are produced from forest resources under some form of management, while still others are outputs of cultivated tree resources within a predominantly agricultural environment. Issues that we may need to know more about include how different forms of management relate to the different roles particular NTFPs play in the associated livelihood and socioeconomic system; the extent to which different NTFP production systems conform to conservation objectives and concerns; and the capacity of existing governance mechanisms to effect desired outcomes.

These three volumes represent one output from a substantial pioneering exercise designed to help fill some of these gaps in our present knowledge base. The study set out to determine what patterns of interaction between factors such as those mentioned above can be discerned from existing information, based on comparative analysis across a substantial number of different products in different situations in Africa, Asia and Latin America. This is not a random, or necessarily representative, sample of case studies. Their choice reflects the availability of the needed information, but the selection covers a wide range of product, circumstance and situation.

The analysis of information provided by this body of work has shown that important patterns can be identified. These are summarised in the introduction chapter of Volume 1. Each volume complements this comparative

analysis by providing a descriptive account of each case study that was contributed from a particular geographical region, prepared by the researchers involved. Together they provide a wealth of information about individual NTFPs and the situations in which they are being produced and traded, and indicate the extent of the research base drawn upon in the course of this important exercise. It is to be hoped that it will provide a starting point for further research and analysis to continue the process of improving understanding of the potentials for NTFP activities to contribute successfully to livelihood enhancement and sustainable forest use.

Chapter 16

The rattan sector of Rio Muni, Equatorial Guinea

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

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

ABSTRACT

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

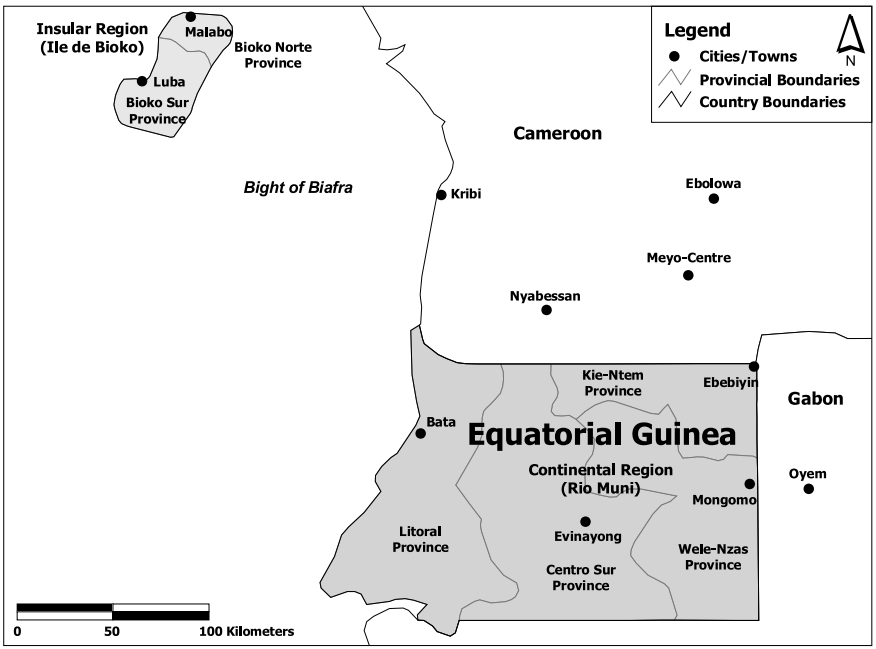
INTRODUCTION

Equatorial Guinea

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

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

Figure 1. Map of Equatorial Guinea (excluding Annobon)



Source: ESRI Data and Maps 2002.

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

The Rio Muni territory

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

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

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

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

The resource base: rattan species utilised in Rio Muni

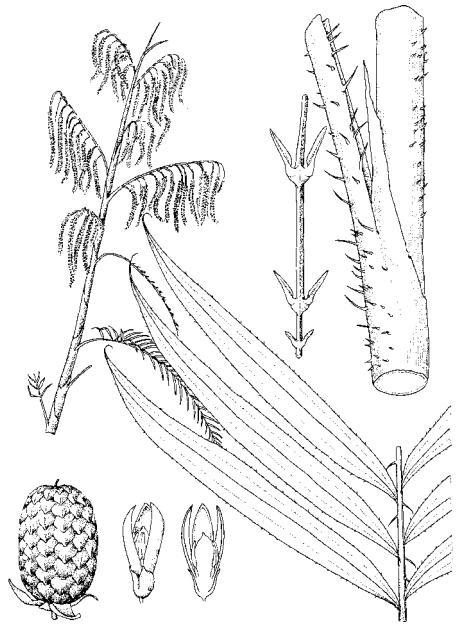
In Rio Muni, mainly three rattan species are collected in the forest for processing and sale. These are the large diameter canes *Laccosperma secundiflorum* (P. Beauv.) Kuntze and *L. robustum* (Burr.) J. Dransf. (*nkan* or *aka*), used whole for furniture framework and split for coarse basketry, and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

Table 1. The rattans of Equatorial Guinea and their use

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

Source: modified from Sunderland 1998.

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



(Laccosperma secundiflorum)

THE PRODUCTION-TO-CONSUMPTION SYSTEM

Raw material production area

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

Table 2. Major supply zones for raw cane to Bata

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

Raw material producers and the socio-economic context

Introduction

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

Village-based harvesting and transformation

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

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

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

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

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

Urban-based harvesting and transformation

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

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

The processing industry

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

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

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

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

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

Trade and marketing

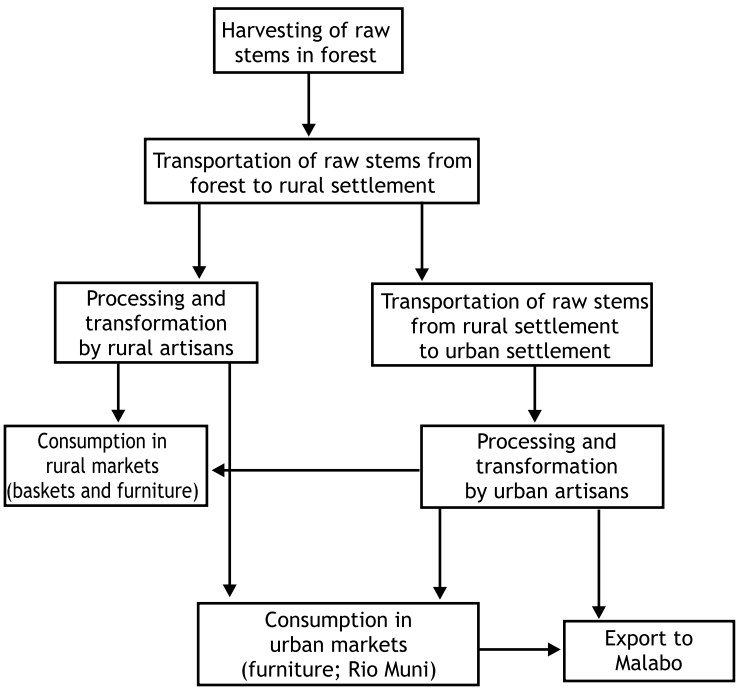
The ways in which rattan moves from the forest to the final consumer are described above. The production-to-consumption system is summarised in Figure 2.

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

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

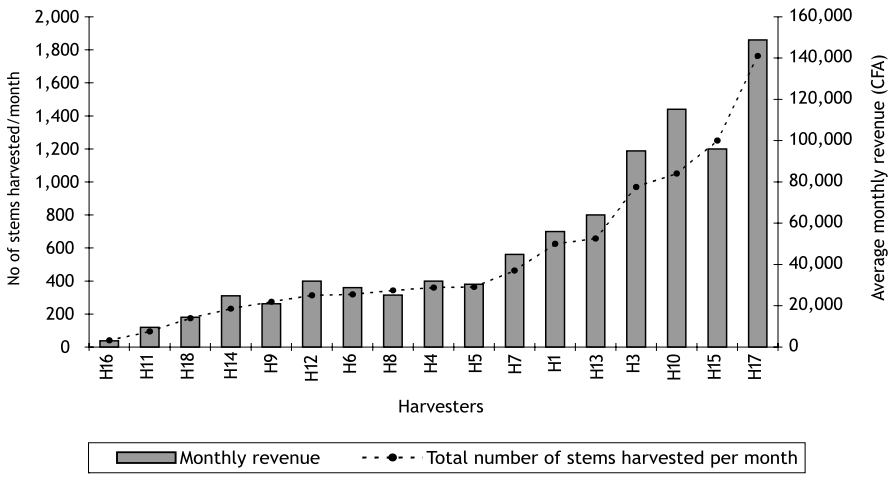
Photo 2. Fabricated chairs for sale in Bata (Photo by T.C.H. Sunderland)

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



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

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



POLICY ENVIRONMENT

Customary laws and controls

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

Legislation and government interventions

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

Formal taxation

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

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

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

Rattan unions

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

TRENDS AND ISSUES

The resource base

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

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

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

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

The trade

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

Livelihoods

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

Development interventions

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

CONSERVATION AND DEVELOPMENT LESSONS OF RATTAN HARVESTING IN RIO MUNI

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

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

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

SUMMARY AND CONCLUSIONS

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

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

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

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

ENDNOTES

1. African Rattan Research Programme, P.O. Box 437, Limbe Botanic Garden, Limbe, Cameroon. E-mail Terry C.H. Sunderland: TCHSunderland@aol.com; E-mail Michael B. Balinga: mpbalinga@yahoo.fr

2. University of Buea, SW Province, Cameroon.

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

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

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

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