CONSULTING SERVICES BY ENVIRONMENTAL RESOURCES MANAGEMENT

FINAL REPORT

Department for International Development

Cross River State Community Forestry Project: *Non-Timber Forest Products Advisor*

September 2001

Environmental Resources Management
8 Cavendish Square, London W1M 0ER
Telephone 0207 465 7200
Facsimile 0207 465 7272
Email post@ermuk.com
http://www.ermuk.com
&
Scott Wilson Kirkpatrick & Co Ltd
Avalon House, Marcham Road, Abingdon,
Oxon, OX14 1UG
Telephone 01235 555535
Facsimile 01235 553203

ERM

FINAL REPORT

Department for International Development

Cross River State Community Forestry Project: *Non-Timber Forest Products Advisor*

September 2001

ERM Reference 6133

Prepared by: T.Sunderland

For and on behalf of Environmental Resources Management	
Approved by:	D K JAUGHRAY
Signed:	
Position:	DIRECTOR
Date:	19/09/01

1. EXECUTIVE SUMMARY

The economy of Cross River State is heavily reliant on both timber and non-timber forest products (NTFP's) for revenue generation. However, these resources are traded in very different marketing systems and whilst up to 80% of timber revenues enter the official statistics, it is estimated that as little as 50% of the total revenues generated by NTFP's enter the formal economy. The disparity has led to an over-emphasis on the timber resource by Federal and State Government as well as by development agencies and a historical neglect of a holistic approach to forest management. However, considerable research undertaken as part of the first ODA-assisted project (1992-1995) highlighted the importance of the harvest and trade in NTFP's to the rural and urban communities of Cross River State. In addition, it was further determined that these products have significant potential to contribute *both* to the livelihoods of forest-based communities and to a coherent strategy of sustainable forest management.

A number of key NTFP resources are identified as having an especially important economic role within Cross River State and are major sources of revenue both to indigenes and non-indigenes alike. These resources include bush mango, afang, *Carpolobia* cattle sticks, *Randia* and *Garcinia* chewsticks, rattan canes and bushmeat; the "big seven". Analysis of the collection, processing, marketing and trade of these resources forms the basis of this report. However, a number of other NTFP's are also widely traded and provide a diversified source of income generation for many rural communities. The trade in these resources particularly highlights the vast range of NTFP's harvested and traded throughout the State and the economic reliance on them by local communities.

Despite the varied range both in products and the means in which they are traded and marketed, there are general trends that characterise the NTFP sector in Cross River State. In particular, despite the general perception within the global forestry sector that the harvest of NTFP's is a relatively benign activity, undertaken in harmony with the forest system, in Nigeria many forest products are being significantly over-harvested leading to considerable local scarcity and subsequent fluctuations in supply. With the exception of products that are harvested non-destructively, such as bush mango, and those that are harvested at relatively low intensities, the harvest of many NTFP's is undertaken in an uncontrolled and highly destructive manner (in particular *Carpolobia* cattle stick and *Randia* and *Garcinia* chewsticks).

There is a significant lack of information with regard to the baseline ecological knowledge that could be used for the development of sustainable strategies for wild harvest for most NTFP species. In particular, knowledge of the density and distribution, regeneration and recruitment, growth rates, phenology and recovery post-harvest information that is essential for the establishment of yield quotas is woefully incomplete for most NTFP resources. Gathering this information requires a commitment to long-term studies of the key NTFP's to facilitate the provision of guidelines for sustainable utilisation of these forest resources and *before* harvest quotas may be determined.

Cultivation efforts aimed at reducing the pressure on the wild resource are also an important means of developing sustainable supplies of NTFP's particularly when

incorporated into indigenous land-use and agricultural systems. Good examples of community initiatives involved in cultivation (e.g. bush mango) provide a model to follow for other NTFP's. Cultivation techniques for a number of these high value NTFP's have been developed elsewhere and, particularly in the case of afang and rattan, could provide a significant source of revenue for local rural initiatives.

The marketing structure for most resources shows that indigenes are predominantly involved at the collector level and their level in participation diminishes as the product moves up the trade chain. This is particularly so for NTFP's that have a greater export demand (*Carpolobia*, *Randia*, etc.) but is also, somewhat surprisingly, the case for bush mango and afang, products with high domestic markets. The lack of tangible, and equitable, benefits accruing to communities in Cross River State from NTFP's harvest and sale is a significant constraint to their sustainable management.

In general, processing and transformation of the majority of forest products, the activity that often adds the greatest value at that particular point in the marketing chain, is undertaken and controlled predominantly by non-indigenes. Despite the fact that processing of most products prior to transportation and sale is at best rudimentary, the poor levels of local transformation considerably affect the ability of many rural communities to capture the full benefits of the trade in NTFP's. Although there are notable general trends for the trade in plant-based NTFP's, the bushmeat sector, and the issues surrounding it, is far more complex and would benefit from a more in-depth study of this resource alone.

Despite its value, the development of the NTFP sector is hindered by a poor system of revenue collection within the formal State economy, unlike that of timber. In particular, this is the result of institutional shortfalls in the forest legislation and the lack of management capacity within the Forestry Commission. In addition, the lack of incorporation of NTFP's to the remit of the Forest Management Committees (FMC's) to date also constrains the formalisation of the sector. If these revenues were indeed contributing to the formal forestry sector (i.e. such as operates for the timber resource where official revenues, based on exploitation quotas, are collected and contribute directly to the State's treasury) there would be a significant change in how such products were both perceived and managed.

Finally, the scale, importance and organisation of the trade network for many NTFP's cannot be over-emphasised, in particular the cross-border trade between Nigeria and Cameroon. This represents a potential source of revenue for both countries; an opportunity that is currently being missed. The fact that significant revenues accrue to the informal sector in this way indicates a "willingness-to-pay" on the part of NTFP traders and transporters. There is an urgent need to control and monitor the cross-border, and the interstate trade, not only for the benefit of the formal forestry sector, but also to allow the determination of sources of supply and potential future scarcity.

2. INTRODUCTION

This report is based on the results of a recent consultancy carried out in Cross River State from the 13th May to 1st June 2001, for the DFID-funded Cross River State Community Forestry Project (CRSCFP). This field visit consisted of a series of market surveys, interviews with forestry staff and resource users as well as meetings with

selected FMC's. A comprehensive literature review preceded the field visit to Cross River State.

The format of the report follows the terms of reference of the consultancy, specifically:

- To collate vital background information through reading, brief data collection exercises and interviews with community members and FC staff to provide the following:

    - An assessment of the current NTFP resource availability in selected FMC's;

    - An update on what NTFP's are collected and in what quantity, concentrating on the five priority NTFP's. If these priority NTFP's are not included in the top five, then substitute those NTFP's important to that particular community;

    - A review of the primary and secondary processing that takes place and the costs associated with these;

    - Information on the typical revenues associated with NTFP's and report any changes from the subsistence to cash economy, or *vice versa*, since the last project.

- Evaluate the existing community regulatory systems for the exploitation of NTFP's and derived revenue and advise on the opportunities for improving and strengthening the regulation of access to those resources to maximise community revenues and assess the role of unions in the NTFP trade.

- Comment on what level of sustainable production is feasible, based upon existing information / community knowledge and advise on how production can be increased. Comment on the possible effects that this increase might have on the productive capacity of the other elements of the forest system.

This report reviews the NTFP sector of Cross River State and pays particular reference to seven key NTFP species. Each of these resources, and the conditions under which they are traded, are discussed in detail. At the request of Forestry Commission officials a number of other NTFP resources are also included in the review and provide additional useful information on the nature of the NTFP trade. To provide a contextual framework for the NTFP sector, the legislative and institutional constraints pertaining to the harvest and sale of NTFP's, particularly with regard to the activities of the Forestry Commission and the FMC's is also discussed. For ease of reading and hopefully to provide a framework for activities aimed at developing the NTFP sector, boxed recommendations are made throughout the body of the document at the appropriate discussion points (i.e. recommendations aimed at developing the cultivated resource for bush mango resource are included within the discussions of bush mango cultivation).

Further recommendations are made for the development of the NTFP sector with respect to developing sustainable, and equitable, strategies for exploitation. These include, proposals for better natural management, cultivation and agroforestry,

greater indigenisation of the marketing chain and improved processing and transformation techniques that can add value at the community level.

3. SOURCES OF INFORMATION

3.1 Literature review

There is a great deal of available baseline information on the NTFP sector of Cross River State. The following sources were of particular assistance in the formulation of this report (a detailed list of this reference material is attached in Appendix 1);

• *Project reports from the previous ODA-assisted forest project*;
Considerable work in the NTFP sector of Cross River State was undertaken as part of the previous ODA-assisted forestry project (1992-1996). Alexander and Effa in particular, in a number of reports, present an enormous amount of baseline data on a wide range of NTFP species used, traded and sources of supply etc. Building on this baseline information Omuluabi and Abang (1994) provide a more coherent overview of the NTFP sector from a resource and marketing perspective and summarise the main constraints and interventions needed. The inventory report produced by Otu *et al*., (1994) usefully includes the stocking of some NTFP's.

• *Annual reports of the Forestry Department (now Commission)*;
The Forestry Commission compiles permit data and evacuation figures (records of forest produce leaving CRS) for their annual reports. Although in recent years the reports have been hand written and data is not adequately managed and analysed, they contain useful estimates of the scale and value of the NTFP trade both within Cross River State, and that exported from the State.

• *Socio-economic survey reports from Living Earth Nigeria Foundation;*
In recent years, Living Earth has compiled a significant amount of information on the community-based management of forest resources, particularly with their target communities. More recently, Morakinyo and Ekpe (2000) compiled a report specifically aimed at the development of the Danare and Abontakon forest management capacity.

• *African Rattan Research Programme household and artisan surveys reports;*
As part of the African Rattan Research Programme activities in Cameroon, Ghana and Nigeria, socio-economic surveys to determine the household importance of rattan, in the context of total forest resource use are being undertaken in collaboration with Living Earth. In Cross River State, this information is being gathered in Danare, Abontakon and the Ekuri villages. In addition to these household surveys, artisan markets throughout Cross River and Akwa-Ibom States have also been sampled to determine the nature and scale of the rattan trade.

• *Recent CRSCFP consultancy reports;*
Fripp (2001) recently undertook a useful socio-economic analysis of the Abu-Bashu communities which, despite being incomplete, provides good information on the importance of forest products to rural households. A further study and review of the legislative framework of the forestry sector in Cross River State is also extremely informative.

• *Other relevant literature;*
The Primate Preservation Group, an NGO based in Calabar led by Edem Eniang has undertaken a number of studies of the bushmeat trade, particularly around Ekong-Anaku. Mr Eniang, kindly made a number of his reports available to us. Other useful literature included a number of recent NTFP surveys from SW Province, Cameroon, which make specific mention of the cross-border trade in forest products between Cameroon and Nigeria.

3.2. Market surveys

Knowledge of which NTFP's are sold and in what quantities is not enough information to design practical conservation, management or rural development strategies for those species in trade. It is equally important to know who is involved in the trade along, often complex, marketing chains, how this is organised, where the present source areas are and how supply and demand are likely to change in the future. In order to update the information presented in Omuluabi and Abang (1994) surveys were undertaken in selected markets in Cross River State that are specifically involved in the trade in NTFPs. The markets surveyed were as follows: Calabar (Watt), Ikom, Ikang, Ekang, Ekong, Aningeje, Agbokim, Amana, Bendeghe-Ekim and Ekukunela. Particular emphasis was made on surveying the cross-border markets that had only been cursorily mentioned in previous reports.

During the market surveys, where possible, a group of wholesale traders were interviewed during group sessions. These interviews provided invaluable information with regard to the structure and nature of the trade, as well as determining the possible influence of organised, or cartel, behaviour.

3.3. Semi-structured interviews

Both group and individual interviews were undertaken with resource users in communities identified by the Project as being of particular importance for forest product management and exploitation. These represented a stratified sample of communities throughout the State. The communities selected were; Ekong-Anaku, Abu-Mpang and Iko Ekperem. In each community at least two persons concerned with the exploitation and trade of each major NTFP was interviewed in group sessions. These resource interviews provided an extremely useful overview of the community-level involvement, or not as it turned out in many respects, in NTFP harvest and trade. Further information was gathered through meetings and discussions with the FMC's in each of these communities.

4. NTFP's IN CROSS RIVER STATE

Non-timber forest products (NTFP's) are products originating from forest systems that provide a wide range of goods, services and products, other than that of timber. Millions of people through the tropics rely on the harvest and sale of a wide range of NTFP's for their economic well-being and it is only relatively recently that the importance of these resources has been realised and NTFP's have become the focus of numerous research and development initiatives. These initiatives are concerned, primarily, with combining the need for the exploitation of forest resources whilst ensuring, through sustainable utilisation, the conservation of the very systems in which they occur. Indeed, this paradigm shift has been so marked that non-timber

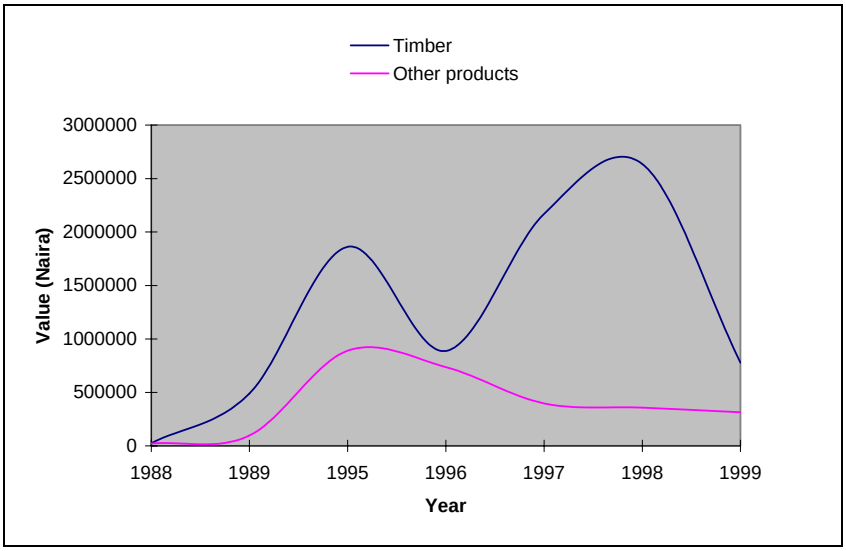
forest products are now regarded as having a significant role to play in contributing to conservation and community development initiatives through product promotion and coherent strategies that provide a framework for forest-based "sustainable development".

However, that in order for this to happen, the promotion and development of high value NTFPs must take place in the context of adequate baseline biological knowledge of the species concerned, understanding of the marketing systems in which they are traded and accompanied by appropriate forest legislation. This framework can then provide a mechanism by which the equitable distribution of benefits, community participation in resource management and the generation of forest product revenues can be realised.

In common with many areas in the Tropics, the population of Cross River State depends heavily on the exploitation of the forest resource base. It is estimated that up to 65% of the population of the State depends on farming and forest exploitation systems for both subsistence and cash incomes (Omuluabi and Abang, 1994). NTFP's in particular help to stabilise incomes as they can be harvested during periods of low farm labour demands and at times of peak NTFP production. Bissong (cited in Omuluabi and Abang, 1994) suggests that as much as 40% of the total cash income for rural families may be derived from forest product harvest and sale.

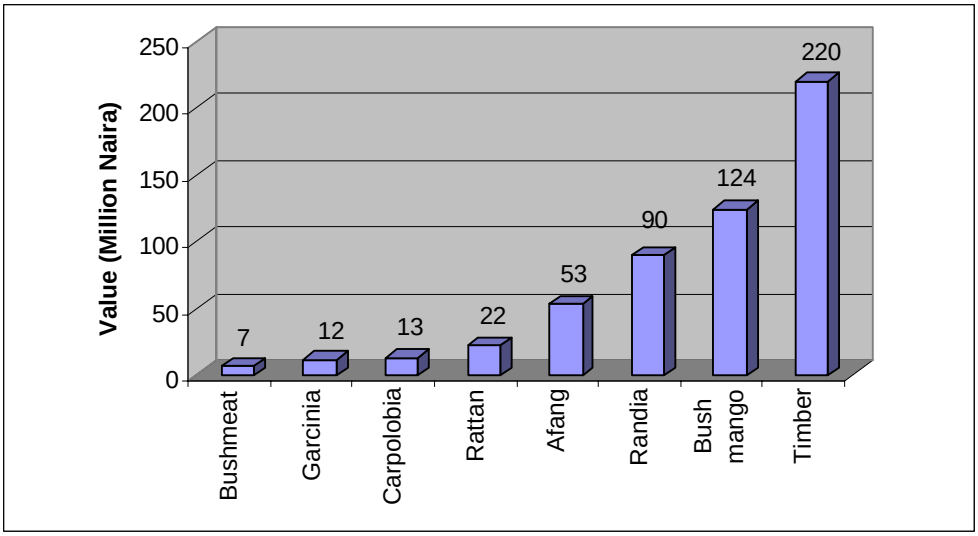
Although, Alexandar and Effa (1994) found that as many as 434 species (representing around 709 different uses) were utilised and traded throughout the State, the sector is heavily reliant on a few high-value NTFP's. The scale and organisation of this sector is thought to be comparable to that of timber in terms of revenues and numbers of people engaged in the harvest and trade. However, the fundamental problem with this trade in NTFP's is that the majority of the benefits are realised in the informal economic sector (i.e. they do not enter the official taxation system) and are hence often unquantifiable.

Figure 1. Revenues collected from the evacuation of forest resources from the State; despite their value, the full benefits of NTFP's are not often captured in official revenue statistics (Source: Forestry Commission Annual Reports 1995-1999).



Despite this, based on estimates of the quantities traded, the scale of the trade in key forest products indicates a thriving and highly lucrative industry. For example the cumulative, or total annual trade in the major NTFP species alone is estimated to be N321 million (whereas the domestic market for timber is estimated at N220 million)[1].

Figure 2. Estimated annual value (million Naira) of key forest products in Cross River State, Nigeria (Compiled and revised from Omuluabi and Abang (1994); CRSFC Annual Reports 1988-99).



In recognition of the economic importance of NTFP's in Cross River State, the previous ODA-assisted undertook a great deal of research on the NTFP sector of the State. The work of Alexander and Effa (1994) provided and extremely comprehensive overview of the household consumption, origin and nature of the NTFP trade while Omuluabi and Abang (1994) undertook a much more detailed study of the marketing chains and trading systems of key, high-value, NTFP's. Unfortunately, the momentum of these studies was interrupted by the project coming to an end in 1996 and hence the recommendations resulting from this work were never implemented. However, despite the fact that the current Project has only a further year to run, there now exists an opportunity to build upon, and update, this excellent baseline information to incorporate NTFP's into the formal forestry sector. This is particularly pertinent given the creation of the network of Forest Management Committees (FMC's) that are now being provided with the capacity to undertake the management of, and benefit from, forest resources for themselves.

5. THE KEY NTFP RESOURCES OF CROSS RIVER STATE

The following information provides a descriptive overview of each of the key NTFP resources currently traded in Cross River State. A brief introduction to the biology and ecology of each resource is followed by detailed information on how each is exploited, traded and sold and by whom. At the relevant sections, recommendations, aimed at achieving the objectives of the CRSFC and CRSCFP, are provided.

[1] Based upon 2001 Naira value.

5.1. Irvingia gabonensis & *I. wombolu* **(Irvingiaceae)**

bush mango (vern.); **bojep** (Boki); **ogbono** (Igbo); **uyo** (Efik); **uyo** (Ibibio)

5.1.2. Introduction

The two botanical species that comprise the resource known as bush mango are large forest trees up to 35m tall. *I. gabonensis* is restricted to the forested region from eastern Nigeria to the northern Congo Basin, whilst *I. wombolu* has a wider range through West Africa, reaching as far Senegal. The cotyledons of both species are used as a soup thickener and as a condiment. However the period of production varies for each; *I. gabonensis* is the rainy season bush mango and *I. wombolu* the dry season type. The species are further distinguished by the possession of a sweet (*I. gabonensis*) or bitter (*I. wombolu*) mesocarp, or "fleshy part" of the fruit.

Whilst predominantly forest species, due to its economic value bush mango is encouraged on farm and fallow land throughout Cross River State. During clearance for farms, mature individuals of both species of bush mango are retained and any seedlings encountered are nursed to maturity. Where resource tenure is strong, particularly in the Boki area, some planting is also undertaken.

The fruits of both species of bush mango are produced every year however, notably for *I. gabonensis*, there are particular years when fruit production is markedly increased. There seems to be no discernible pattern to this "mast" fruiting and the sporadic fruit production is a considerable concern to the majority of bush mango harvesters and dealers as supplies diminish during these years.

The harvest and sale of bush mango is a major source of income for rural communities, not only in Cross River State but throughout the geographic range of the species. A recent socio-economic survey undertaken in the Abu-Bashu group of communities determined that 91% of households were involved in the collection and sale of bush mango. This represents a mean annual income of N33,750; or 50% of the total household income (Fripp, 2001).

5.1.3. Production-to-consumption system for bush mango

Throughout the community forests of Cross River State the collection of bush mango is undertaken almost exclusively by the indigenes of an area. However, forest permit data indicate that non-indigenes dominate the collection of bush mango in forest reserves, particularly in Akamkpa and Oban.

In the community forests, bush mango collection and processing is often a family affair and is undertaken by most able-bodied members of the household. Women and adolescent children are particularly involved with harvesting bush mango. Although a proportion of the total fruits collected are from farm and farm-fallow, the majority are collected in the forest, often far from the community. During the fruiting season many families re-locate to "bush-houses" deep in the forest where they can reside for periods of up to a week, or even longer.

The collection process is as follows: the fallen fruits are collected and are then stacked until the pulp has rotted away. This might take place either at the point of

collection, or back in the village. Once the pulp is rotted, the nuts are opened manually, usually with a cutlass, and the cotyledons are then scraped out with a knife.

Trees inside the forest do not belong to any one individual or family and fruit collection is determined on a "first-come first-serve" basis. However, trees planted or nurtured on farmland are owned by those on whose land it occurs and it is reported that the rising value in bush mango has led to some people clearing land around bush mango trees in forest, so as to secure collecting rights to them. This system has been identified in the communities of Danare and Abontakon by Morakinyo and Ekpe (2000). It is also reported that in these communities, bush mango buyers will meet individual farmers prior to the fruiting season to "book" the harvested cotyledons.

The majority of bush mango, especially the rainy season type, is sold either fresh or in a semi-dry condition. The cotyledons are primarily sold per cup, or basin, and these measures are then amalgamated into 25-50kg sacks by the wholesale buyers. The majority of the bush mango in Cross River State is bought by Igbo and Ibibio traders who transport large quantities to warehouse facilities outside of Cross River State. Many of these same buyers also travel to Cameroon where significant amounts of bush mango are purchased and transported across the border.

The towns of Onitsha, Aba, Abakaliki and Owerri and Enugu are recognised as significant accumulation, drying, storage and distribution points for bush mango. Once at these warehouses, the cotyledons are dried completely (usually in the sun) and can then, after the addition of an insecticide to protect against weevils, be stored for up to 12 months. It is from these points that further distribution takes place and bush mango is traded throughout Nigeria and there is even a thriving export trade to supply African ex-patriots in Europe and the United States (Tabuna, 1999). Ironically, there is also some return trade from these central market points back to Cross River State, the original point of origin, for sale.

Previous reports of cartel behaviour and bush mango unions were investigated during this study. Whilst the majority of the middle-men are indeed Igbo and Ibibio traders who dominate the wholesale market, there is no price fixing of the resource. The role of the unions reported on is more as a welfare provider (i.e. to help other bush mango dealers in times of need). At best, any organisation within the bush mango sector is described as "weak" (Omuluabi & Abang, 1994). In short, the market is essentially free and competitive with many buyers and sellers.

5.1.4. Grading and re-sale

At these warehouses, to maximise the revenues from the trade, some preliminary product grading takes place. The cotyledons are graded according to a number of criteria, the most important of which are:

- Appearance (including cotyledon size, colour and shape);
- Condition (pest and mechanical damage);

However, further criteria have also been suggested as being important.

- Oil content;
- Flavour and drawability.

Based on extensive producer and consumer interview surveys, Daniel Ladipo of CENRAD in Ibadan has developed a standardised grading system for bush mango cotyledons. His hypothesis is that if grading takes place at the community level, then the majority of the benefits currently captured by non-indigenes would accrue to the community-based collectors. It would also ensure that a fair price is paid for good quality bush mango and *vice versa*, rather than the flat price paid for all material at present.

Table 1. *Irvingia* kernel parameters and quality classes (source: Ladipo, 1999).

Grade of sample	Parameters
A	• No debris in kernel mass • Kernels dry (8% moisture content) • Cream in colour • Kernel is whole, unbroken • Kernel powder is very slimy • No pest damage • No fungal damage • Kernel is large and thick
B	• Little debris in kernel mass • Kernels dry (8-10% moisture content) • Cream / yellow in colour • Average kernel size • Kernel powder averagely slimy • No pest damage • No fungal damage • Kernel is averagely large and thin
C	• High debris content in kernel mass • Kernels dry (+10% moisture content) • Darkish brown in colour • Kernel size variable • Kernel powder not particularly slimy • Slight pest infestation • Slight fungal infestation • Kernel small and thin
D	• Very high debris content in kernel mass • Kernels inadequately dried • Blackish (mottled) or green (immature) in colour • Kernel powder not at all slimy • Kernel broken into pieces • Heavy pest infestation • Heavy fungal infestation • Kernel is small and thin

Recommendation: Community-level options for the grading and marketing of bush mango should be investigated. In this regard, it might be appropriate for Dr Ladipo to undertake a short consultancy to advise on the modalities and potential benefits of implementing such a system.

5.1.5. Drying, storage and processing; opportunities and constraints

With two main production periods, June to September, and February to April, there are periods where the market is flooded with bush mango, with a corresponding price decrease, as well as periods when bush mango is not so readily available, and the market value is somewhat higher (up to 300%). Despite these peaks and troughs

in production, very little attempt is made at the community level at drying and storage to ensure a more consistent supply. As well as the need for immediate income by most families, the main reason for this is the difficulty in adequately drying the cotyledons, particularly in the rainy season. However, certain local storage techniques are practised in some areas. For example, in the Ekuri villages, the rotting fruits of bush mango are stuck to the clay walls of the houses where they dry and are able to be stored in this way for up to six months. When the bush mango is needed, the fruits are removed, the nuts cracked and the cotyledons scraped out. Another form of local storage consists of forming "balls" of 8-12 rotting fruits, which are then smoke-dried. This is more common in the Boki area. Again these may be stored for up to 6-12 months. However, the majority of the material stored in this manner is more commonly held for household consumption and is not sold. The main reason for this, it seems, is that the cotyledons are subject to some shrinkage whilst inside the nut and are not suitable for sale, particularly when there is better quality dried material available elsewhere in the markets.

A common form of preservation practised in southern Cameroon and Gabon is the processing of the cotyledons into *odika* or *dika* cake. To make this, the cotyledons are ground and heated in a pot lined with banana leaves to melt the fat and then left to cool. The resultant grey-brown mass is then placed in a mould and dried, either naturally in the sun, or over a fire. During the moulding, pepper and other spices can be added. The resulting cake can store for a long time and is used in the same way as the whole cotyledons. It is surprising this form of local storage is not practised more commonly in Nigeria.

There are, however, good examples of community-based drying and storage of bush mango. For example, in cocoa-producing areas in Cameroon, the cotyledons are dried using the cocoa-drying process; a roofed area with a flat concrete bed is built 1m above a hearth in which a low constant heat (from burning fuelwood) is applied. The kernels are not subject to direct smoking, and so are not tainted and are dried extremely efficiently; in this state they can be stored effectively for up to 12 months.

Recommendation: A number of pilot communities should be identified for whom this low technology drying technique would be appropriate. Ideally, these would be communities who are actively involved in the cocoa trade and who would additionally benefit from being able to also dry and store this product more efficiently. The CRSCFP could fund the establishment 3-5 of these model drying facilities in collaboration with key FMC's.

It is known that stored bush mango is rather prone to weevil attack and those commercial wholesalers currently involved in storage add some insecticide to the sacks prior to closure. If community-based storage is to be encouraged, it is recommended that investment is made in suitable, and cost-effective insecticides.

Small interventions at the community-level, such as preliminary grading, drying and storage that can add value to a product is a fundamental tenet in the development of the NTFP sector. Care must be taken however in not underestimating the influence of non-indigenes on the current bush mango market. For example, wholesale buyers might not be receptive to community-based price increases due to improved drying and grading for example, and may purchase from less-enlightened collectors

elsewhere. To counteract this, it might be necessary for micro-credit facilities to be made available to enable communities to purchase and store large quantities of bush mango for sale and distribution when supply is low and the market price is correspondingly high. This intervention has recently been proposed for two Living Earth communities with well established and effective FMC's, Danare and Abontakon, and seems a sensible and realistic approach to begin to capture the real market value of the bush mango resource. By selling in times of relative paucity rather than at times of abundance, Morakinyo and Ekpe (2000) estimate that the real income of the dried and stored bush mango could be increased significantly; this could represent a considerable source of revenue.

Recommendation: CRSCFP should monitor the Living Earth proposed bush mango micro-credit scheme for Danare and Abontakon and, if appropriate, identify suitable FMC's for pilot micro-credit support to facilitate community-level drying and storage.

5.1.6. Sources of supply

Although, both species of bush mango are widespread throughout the forest region of Cross River State, forestry records indicate that the main sources of supply of bush mango to the markets are Odukpani, Boki, Akamkpa, Ikom, Obubra and Biase LGA's. There is also a substantial import of bush mango into Nigeria from Cameroon. The major entry points are Mfum and Ekang, although material is also recorded as crossing through border points of Agbokim, Ekong-Anaku and Amana.

5.1.7. Amount and value of the bush mango trade

The local and international trade in bush mango products is reported to be worth an estimated US$50 million and the product is listed on the weekly commodity lists in Nigeria (Ladipo, 1999). It is interesting to note that the price of bush mango has steadily increased over the past ten years. Analysis of the records from the State border forestry posts suggest that the mean annual estimated volume of bush mango exported from Cross River alone is a little over 600 metric tonnes (with a present market value of N72 million). In the absence of adequate corresponding import data, it is not possible to determine the quantities of Cameroonian origin. Omuluabi and Abang (1994) estimate that as much as 70% of the bush mango either collected or imported into Cross River State is subsequently re-exported; it can then be assumed that an estimated 260 metric tonnes are traded within the State (valued at N52 million). Hence the mean annual production of marketed bush mango is estimated to be 860 metric tonnes with a total market value of N124 million. It should be noted that these figures do not capture the substantial household consumption of bush mango in Cross River State, nor do they capture the significant (up to 300%) price increases during times of scarcity; they can thus be considered rather conservative. It is also unclear what proportion then returns to Cross River State for re-sale after drying and storage.

The wholesale unit of sale for bush mango is the 50kg bag. At the peak collection period the 50kg equivalent amount in tasas, or basins, is currently purchased from community-based collectors for around N 7,000 and is then re-sold for N 10,000. The

retail unit of sale is a standard 7cc cup, which is sold at N100-150. During periods of scarcity, both the wholesale and retail prices can increase by up to 300%.

5.1.8. Community-level controls and benefits

Because of its value, there are considerable community-level controls on the harvest of the bush mango resource from community forests. Primary amongst these is that non-indigenes are discouraged from harvesting bush mango and the majority of the harvesting is undertaken by natives of the village. However, there are instances when non-indigenes are able to collect bush mango. Firstly, non-indigenes who have settled and become integrated into a particular community may have access to the bush mango resource, and operate under the same conditions as indigenes. Secondly, collection may be undertaken by strangers after the payment of a levy to the community leaders. This is commonly the case in the Abu-Bashu group of villages. Many communities in Cross River State require outside buyers of bush mango to register in the village before they are permitted to purchase any material. There is currently no standardised rate. For example, in Abu-Mpang N350 is paid to register as a buyer, and then a further N550 is then paid per week for "evacuation", although this evacuation fee is not based on quantity. In contrast, in Iko Ekperem, N600 is paid for registration whilst no further charges are made for evacuation. All revenues raised through this means go to the village community fund and not directly to the FMC. This pattern is repeated for many other NTFPs. In Ekong-Anaku, non-indigenes who collect bush mango without permission are subject to an immediate fine of N20,000 or the confiscation of the produce.

Traditional controls also include the prohibition of the felling of individual bush mango trees in any circumstances and collectors are not allowed to climb any tree and harvest the unripe fruit; the fruit may only be harvested after it has ripened and fallen to the ground.

5.1.9. Legislative controls and official tariffs

Consistent with customary law, *I. gabonensis* is included on the list of Protected Species of the 1999 Forest Law that must not be felled. Unfortunately, the recent nomenclatural change that separated the sweet and bitter bush mango (Harris, 1996), is not reflected in the current forest schedule and *I. wombolu* is not included on the list. Despite the fact that people generally include both species as a single resource, it is important that the Forestry Law is accurate and avoids any opportunity for ambiguity.

Recommendation: Along with *I. gabonensis , Irvingia wombolu*, the dry-season, or bitter, bush mango should also be included on the list of Protected Species in a future revision of the Forest Law.

To collect bush mango from within a forest reserve a permit must be obtained from the local Charge Office. This annual permit is currently set at N5,000 although most collectors pay on a monthly basis (N800), preferring to buy the permits during periods of peak production. This permit also allows for the transportation of bush mango so middle-men who purchase from Cameroon, as well as from Cross River communities are able to transport their produce unhindered. The permit system is

such that currently no quantities for collection and transport are specified. Charge Offices can control collectors and transporters who do not have the necessary documentation and on-the-spot fines of N 20,000 – N 120,000 may be applied. If the transporter is unable to pay, then their produce may be impounded. Permits are not necessary for the collection of bush mango in community forest by indigenes.

5.1.10. Overview of resource availability

There are few reports of scarcity of bush mango. Stocking estimates suggest that there is good regeneration and there are as many as 6.31 stems per hectare, representing as an estimated 2.5 million trees in the high forest alone in Cross River State (Otu *et al*., 1994). Despite the fact that many fruits are collected from the forest floor, enough remain to germinate. It is likely that some dispersal is undertaken by faunal predators prior to collection, and there is strong evidence that collection and transport by people is also dispersing the seeds. For example, there is ample regeneration of bush mango along paths where seeds presumably have fallen from the basins used to carry them from the forest. In the Korup area in Cameroon these areas have been termed "bush mango groves" (Malleson pers. comm.).

The increase in planting, particularly in the Boki area, is also increasing the supply of bush mango. Throughout the State, indigenes planting on farmland are assured of adequate resource tenure and then own both the trees and their products. In general, the dry-season bush mango (*I. wombolu*) is preferred as a planting species, as although it does not yield as much fruit as *I. gabonensis*, it can be sold for more as it has better drawability. A number of Charge Offices have, in recent years, propagated the seed of bush mango for distribution to communities and the previous ODA-assisted project provided a degree of extension support in bush mango grafting for local communities. One of the complaints about planting of bush mango is the time that it can take for first fruit production. Although some provenances can bear fruit after 6-8 years, most take up to 10 years before many individuals produce fruit in adequate quantities. This is stated as being the greatest disincentive to planting. However, Jonathon Okafor in Enugu has undertaken a considerable about of research on the selection of bush mango, particularly in the development of early and high-yielding cultivars. Although, he has traditionally relied on grafting to ensure the cultivars are true-to-type, this production technique is not easily transferable to communities due to the high skills level needed, coupled with relatively low rates of production. It should be emphasised that seed material from improved cultivars would be a better means of bulk propagation for bush mango. Dr Okafor was contracted during the first ODA-assisted Forestry Project to undertake some extension of bush mango and a number of forestry staff were trained in bush mango grafting. The secure and strong market, coupled with regular annual increases in value, makes cultivation of bush mango a viable activity for many communities. It is also compatible with other forms of land use (e.g. as a shade crop for cocoa).

Recommendation: A programme for the seed propagation and planting of improved cultivars for bush mango should be developed in collaboration with Jonathon Okafor, ideally building on the activities of the previous project. Emphasis should be made on the integration of bush mango with other economic activities (cocoa planting, other tree crops).

Most communities recognise the fact that there are "good" years and "bad" years for fruit production and this fluctuation needs further investigation. However, during these periods of shortages of supply, a degree of substitution takes place and okra (*Hibiscus esculentus*), ogbamu (*Diospyros piscatoria*) and draw leaf (*Corchorus olitorus*) are the main resources utilised in this regard. However, the strong cultural preference for bush mango suggests that these substitutes are not a viable long-term alternative if the bush mango resource was in any significant danger of over-exploitation.

Recommendation: To determine the sustainability of the bush mango resource, a long-term ecological study of both species of bush mango should be initiated. Of particular interest would be knowledge of the pollination biology of each species, including the reasons for masting, fruit yields, seed dispersal, and patterns of mortality and recruitment. This would not necessarily be within the direct remit of the CRSCFP, but collaboration might be considered between the FC and a Nigerian academic institution for which funds could be made available for a structured, and well-supervised, PhD programme.

5.2. *Gnetum africanum* & *Gnetum buchholzianum* (Gnetaceae)

afang (Efik); **afang** (Ibibio); **ukasi** (Igbo); **eruru** (Yala)

5.2.1. Introduction

The edible leaves of afang are a staple food product throughout West and Central Africa and provide a significant source of protein, amino acids and mineral elements. The afang resource is comprised of two species of slender forest climbers that are very similar in appearance. However they possess some morphological differences that are recognised by traders and they occur in different ecological conditions. *G. africanum* is characterised by having slightly broad, somewhat firm leaves and is generally found in secondary forest and farm bush. It is a widespread species and ranges from SE Nigeria to Angola. *G. buccholzianum*, on the other hand, possesses slightly narrower, less lignified leaves and is a species more commonly found in high forest. It is not as common in Nigeria as *G. africanum*, and is restricted to the coastal forests of Cameroon through to Congo (Brazzaville).

The harvest and sale of afang represents an important economic activity for many rural people in Cross River State. Fripp (2001) found that it comprised 33.5% of the total household income of the Abu Bashu communities and brought in a mean annual revenue of N22,360; in economic terms it is second in importance in forest product collection and sale only to bush mango.

5.2.1. Production-to-consumption system for afang

In common with bush mango, the harvest of afang from the forest is dominated by indigenes and is widely undertaken by women and children. The leaves are plucked and bundled in the community and may either be sold at the village or is transported to urban markets for sale to wholesalers. The trade itself is rather fragmented with many dealers, and an often complex chain of custody, depending on whether the afang is to be sold and consumed within the State or is exported. As much as 75% of

the afang harvested is exported from Cross River State to central markets in the major cities of the eastern States of Nigeria (Aba, Abakaliki, Ikot Ekpene, Enugu, Owerri, Uyo) and as far afield as Lagos. The dealers concerned with the export trade are, in the main, Igbo's and Ibibio's. The domestic market, however, is dominated by indigenes of Cross River State and collectors themselves may often sell directly to consumers at roadsides and in market places. A great deal of afang is also consumed at the rural level without entering the market system at any point.

A high proportion of the afang traded in Cross River State is collected and imported from Cameroon; an estimated 800 metric tonnes per annum crosses the border at various road and sea entry points. The major crossing points are at Agbokim (by canoe along the Cross River), by road at Mfum and Ekang, on foot at Ekong-Anaku and by sea to Ikang and Oron. This latter trade route is by far the most important, with up to 400 metric tonnes travelling from the port of Idenau in Cameroon each year (Ngatoum and Bokwe, 1994). This cross-border trade operates in two ways: Nigerian buyers either travel to Cameroon to purchase direct from the village-based harvesters; or Cameroonian dealers buy from the communities and transport the product to the central Calabar and Ikom markets for subsequent sale to both domestic and export wholesalers.

There are some weak associations of dealers in afang, however, much like the bush mango unions, these are primarily concerned with welfare provision for their members rather than arranging price-fixing or trade control.

5.2.2. Processing and transformation

With the high perishability of afang, there is little opportunity for introducing improved processing for afang at the community level. However there has, in recent years, developed a thriving export trade in afang to supply Nigerian ex-patriots in Europe and North America. To prolong the storage period of the product, the afang is sliced and dried in Lagos and then packed in "breathable" cellophane bags prior to shipment. Afang, prepared in this way can then store for up to three months.

5.2.3. Sources of supply

As both species of afang do not naturally occur in high concentrations in the southern part of the State, the main collecting localities are Biase, Yakurr, Akamkpa, Ikom and Boki LGA's. However, a good proportion of the afang traded in Nigeria originates in Cameroon, predominantly collected from the SW Province. However, the afang transported through the Idenau export point originates primarily from the Yaounde region (Centre Province).

5.2.4. Amount and value of trade

The unit of trade for afang is the bundle. However, the size and method of tying a bundle is not uniform to the trade as a whole, but is somewhat consistent regionally, often to the extent that dealers can recognise the origin of each consignment based on their knowledge of each region's methods of packaging prior to transportation. Because of this lack of uniform unit of sale, coupled with variations in quality means that there are no standard prices applied for the sale of afang. There is also considerable variation between what dealers refer to as the two "types" of afang

which are, in fact, the two different species. For example, the *G. buchholzianum* "type" is more commonly collected in Cameroon but, being somewhat more soft than *G. africanum*, does not store as well, nor for as long. It is also not considered as palatable and hence does not command such a high price.

It is estimated that 530 metric tonnes of afang is collected and traded within Cross River State or is exported to other consumer regions. A further 800 metric tonnes crosses the border from Cameroon, however, a good proportion of this imported material is shipped direct to Oron in Akwa-Ibom State. A conservative estimate as to the annual value of the trade in afang is N53 million.

5.2.5. Community-level controls and benefits

In almost every community in Cross River State, there are regulations, or by-laws, regarding the collection and purchase of afang. In particular, to ensure a measure of sustainability, harvesting guidelines are stipulated that state that the only the leaves of afang should be plucked and the stem itself should not be disturbed, nor the roots pulled up. Whilst this would indeed ensure a measure of regrowth, it seems unlikely that this practise is adhered to and there are reports of stems being pulled from the canopy and even trees being felled on which afang is climbing upon to obtain the greatest possible harvest.

In general, non-indigenes are not permitted to enter the forest to harvest, unless they are fully integrated into the community. The local emphasis is on ensuring that indigenes benefit from the collection and sale of the resource. However, particularly within forest reserves, non-indigenes are harvesting directly for themselves.

Afang buyers and dealers (usually non-indigenes) who wish to purchase the harvested leaves are expected to register in the source communities, and often pay additional taxes. The annual fees for registration and taxation vary: N500 registration in Ekong-Anaku (plus a further N300 tax for every 100kg transported from the village); N600 registration in Iko Ekeperem (with no other costs); N350 registration in Abu Mpang (with a further N550 tax per month for transportation).

5.2.6. Legislative controls and official tariffs

The 1999 Forest Law stipulates that commercial harvesters of afang must be in possession of a permit for collection if the material is to be harvested in forest reserves. This is obtained for payment of N800 per month or N9,000 per annum. Indigenes do not require a permit for collection in community forests and possess usufruct rights in forest reserves. No further costs are involved when transporting the harvested produce through, or between, States.

5.2.7. Overview of resource availability

Although once a widespread forest resource, there are reports of local scarcity throughout Cross River State and it is clear that the current harvest intensities and practices are leading to a decline in resource availability. The main harvesters, particularly women and children, complain that they need to travel much further into the bush to obtain a once-abundant resource. Moves to promote sustainable

harvesting practices, along the lines of those of the traditional by-laws, would help with the conservation of the wild resource.

Recommendation: CRSCFP should develop optimum guidelines for the harvest of certain NTFP's particularly afang. For this resource, these guidelines would include prohibition of felling trees for access to the stem, pulling down, and breaking the stem itself, or up-rooting the individual; leaves should be plucked only. The FMC's would ideally be responsible for the implementation and enforcement of these guidelines.

Despite a long tradition of afang cultivation in compound gardens in Akwa-Ibom State, there is no such history of cultivation in Cross River State. However, there is strong demand for the knowledge of how to cultivate afang, which is an extremely simple process. Significant strides have been made in Cameroon in the development of community-based cultivation of afang. The initial results have been extremely positive and preliminary afang harvest results from these community trials indicate that annual yield values could form an important source of income for the village-based farmer and domestic grower. Harvesting yields from the intensive afang production trials conducted at the Limbe Botanic Garden have indicated approximately 2kg yield per plant (fresh weight) every six months. As harvesting stimulates the production of new side shoots and branches, more leaf biomass is produced and yields thus increase.

Recommendation: Community-based training in afang cultivation should be introduced to pilot communities in Cross River State. This work should be undertaken in close collaboration with the Limbe Botanic Garden, Cameroon who have developed low-technology methods of bulk propagation for afang and extended this technology to a wide range of target communities. Initial trials indicate that the potential yields, and incomes, are substantial.

5.3. Rattan canes (Palmae)

Laccosperma secundiflorum, L. robustum = large diameter canes;
Eremospatha macrocarpa = small diameter cane (cane rope);

5.3.1. Introduction

Rattans are climbing palms that possess flexible stems suitable for furniture manufacture, basketry and a range of other uses. Although there are 20 species of rattan distributed throughout the lowland tropical forests of Africa, only a few possess the properties required for commercial utilisation. In Cross River State, two species of large diameter cane, *Laccosperma robustum* and *L. secundiflorum* and the small-diameter cane, *Eremospatha macrocarpa* (or cane rope) provide the basis of the rattan industry. Whilst these species are relatively common throughout West and Central Africa and are particularly concentrated in secondary forest, over-exploitation has led to considerable local scarcity in some areas.

5.3.2. Production-to-consumption system for rattan

In common with a number of other forest products that are predominantly exported from the State, rattan is generally harvested by non-indigenes, particularly those of

Ibibio origin. Although some indigenes are involved in the harvest and sale of rattan, particularly in Iko Ekperem, and many harvest for home consumption (for the tying of yams, for example) the pattern of commercial trade in cane is similar to *Randia* chewing sticks (see below). This is reflected by the results of a recent socio-economic survey of the Abu-Basho communities determined that only 0.8% of the total household income was derived from the harvest and sale of rattan.

Throughout its range, rattan is considered an open-access resource and access is facilitated by the payment of a small payment, either in cash or in kind, to the community. Harvesting of the mature stems can be a difficult and unpleasant activity. The sheaths and leaves are considerably spiny are often infested with ants and other stinging insects and dragging the stems down from the forest canopy is extremely physically demanding. Hence, harvesting rattan is predominantly a male activity.

Rattans in Africa are clustering species; i.e. they produce many stems from a single individual. As the stems age and develop, the leaf sheaths slough off indicating maturity and it is the lower portion of these stems that is harvested for use. To facilitate access to the mature stems, harvesters often cut everything in the cluster, including the young and developing stems. This has a deleterious impact on the future production of mature cane as it then takes a relatively long time for the clump to regenerate. Once cut, the canes are bundled and transported to the nearest transportation route and is either traded and consumed locally or subsequently exported from the State. There are very few formal markets for raw rattan; the final sale is often direct to urban artisans. These are predominantly based in Akwa-Ibom, Port Harcourt, Lagos, and Aba. Uyo and Enugu are more commonly supplied with finished products from Akwa-Ibom that are made from raw cane originating in Cross River State. However, a large central clearing-house for raw rattan exists in Maryland, Lagos and a great deal of cane also originating in Cross River is traded here (Morakinyo, 1995).

For the supply of the much smaller domestic market for rattan in Cross River State, harvesters (who can be both indigenes and non-indigenes) supply directly to the artisans. This is often on a "command" basis and there are strong relationships between them. Alternatively, middle-men, usually from Akwa-Ibom, purchase the cane from indigenes in a community and then supply the artisans directly. Rather surprisingly, even in Cross River State, the majority of the urban artisans are non-indigenes; the sector is dominated by Ibibio's from Akwa-Ibom.

5.3.3. Processing and transformation of rattan

Aside from a cursory scraping of the epidermis and leaf sheath, very little is done to process the cane before its final delivery to the artisans. The artisans themselves then, prior to the transformation of cane, scrape away the epidermis with a small knife and then sun-dry the raw cane before it is used to make furniture. This is the case for both large-diameter and small-diameter canes and represents the greatest opportunity cost in furniture production. Recent innovations in rattan processing have recently been introduced to Cameroon from Malaysia and have proved to be an extremely efficient means of adding value and durability to the final rattan products. The main intervention in this regard is boiling of the raw cane in diesel oil. This serves a number of functions:

- It dries the cane by forcing out all the latent moisture;
- It removes the epidermis through heating, negating the need for subsequent scraping;
- It provides protection against termites and other boring insects;
- It gives a glossy and shiny appearance.

During a recent training course in rattan processing and transformation for rattan artisans, undertaken in collaboration with the Forest Research Institute of Malaysia, this technique was introduced to the African rattan sector for the first time and has proved to be of extreme interest. Unions of artisans are now beginning to obtain credit for the establishment of their own central oil-curing units, which would serve a number of artisan enterprises. Because of the better quality of the raw cane and the saving in labour, most artisans indicated during recent markets surveys, that they would pay extra for cured cane. This indicates there is considerable potential for communities to begin to supply artisans themselves with processed, but un-transformed, cane, given the means to do so.

Other basic low-technology techniques in improved transformation such as binding (instead of using nails), steam-bending and using sulphur for fumigation and bleaching have also been demonstrated and adopted. In the next two years, the African Rattan Research Programme has funds to develop similar demonstration processing units in both Nigeria and Ghana.

Recommendation: CRSCFP should begin to identify community-based artisans who are actively involved in rattan work who would benefit from the proposed training in improved rattan processing and transformation which will take place in February of next year. Additional support funds, through micro-credit provision, could be made available for pilot communities to establish their own low technology processing units for them to supply the large urban artisan markets with semi-processed cane (i.e. oil cured but un-transformed into final products). This would be particularly appropriate for communities that are resource-rich in rattan and who currently receive very little benefit from the exploitation of this high value forest resource (for example Ekong-Anaku).

5.3.4. Sources of supply

The main sources of supply of rattan canes in Cross River State are the community forests of Akamkpa, Oban, Ikom, Boje, Bateriko and Obubra. There is little evidence of rattan entering the State from Cameroon although small quantities are reportedly being exported from the Mokoko forest by sea to Oron (Asaha pers. comm.).

5.3.5. Amount and value of the rattan trade

Although in the rural milieu, rattan use is predominantly restricted to basic household items, the urban sector is undergoing a period of growth and prices and revenues are increasing. This is due to the fact that good quality rattan products are rapidly becoming more fashionable among local elite's and the more urbane middle and upper classes. It is estimated that around 60% of the rattan harvested in Cross River State is exported to the markets listed above, with the remainder being

consumed domestically. The total value of this trade is in the region of N22 million (updated from Omulaubi and Abang, 1994).

5.3.6. Community-level controls and benefits

Aside from the receipt of a registration fee and the occasional employment of local harvesters, most Cross River State communities do not benefit significantly from the rattan trade. In fact, some communities do not even request any payment for access to the rattan resource (e.g. Iko Ekeperem). Sensibly, however, the Ekuri villages, now aware of the value of rattan have banned non-indigenes from harvesting in their community forest and undertake rattan collection themselves.

5.3.7. Legislative controls and official tariffs

The harvest and transportation of rattan is controlled by the 1999 Forest Law in as much as permits are required to commercially harvest cane (i.e. more than two bundles of a maximum length of 4m). In an attempt to distinguish between the large and small-diameter canes, the names *Laccosperma* and *Calamus* are used in the Schedule. However, whilst *Laccosperma* is a good umbrella term for the large-diameter canes, the rattan genus *Calamus* is not used commercially and, as it is used to cover the small-diameter cane, refers to *Eremospatha macrocarpa*. To avoid this confusion and any ambiguity, the terms "large-diameter, >1cm" and "small-diameter, <1cm" would be more appropriate.

Recommendation: To ensure the correct resource base is being adequately controlled, the names *Laccosperma* and *Calamus* should be replaced by in future revisions of the Forest Law by "large-diameter, >1cm" and "small-diameter, <1cm" canes respectively.

Permits to collect cane are required for those harvesting from forest reserves. These are obtained at the costs of N200 for bundles of 50 and 25 for the large-diameter and small-diameter canes respectively or N12,000 per lorry load. Further costs are incurred through interstate export; N10 per bundle of 50 and 25 for the large-diameter and small-diameter canes respectively plus N2,500 per lorry load or N1,000 per pick-up load.

5.3.8. Overview of resource availability

Whilst rattans regenerate well in disturbed forest and are a common component of secondary vegetation, there is considerable evidence that the current harvesting techniques and levels are leading to local scarcity. Many harvesters report the need to travel further distances into the bush to harvest cane. Land clearance for farm establishment is also affecting the rattan resource close to communities, with many people cutting and burning the clumps as they did not realise the value and "*e dey plenty for bush*"; this was commonly witnessed in Ekong-Anaku. However, in other areas, particularly Biase, scarcity of cane has become particularly acute and alternative sources of supply are being sought.

Better management of the wild material would substantially reduce the impact of harvesting. For example, not cutting the young and immature stems allowing them

to regenerate would increase the productivity of the stool and allow the harvester to return to the clump to harvest on a shorter rotation. It also ensures the survival of the individual cluster. However, better management relies on a level of resource tenure and often non-indigenes are not particularly concerned about the long-term impacts of their harvesting operations. Ensuring that rattan harvesting is undertaken by indigenes would ensure a degree of investment in the management of the resource.

There are moves towards developing a cultivated source of rattan and, being an arboreal climber, rattan lends itself well to incorporation into agroforestry systems. In SE Asia such rattan gardens provide an important source of income for subsistence farmers; rattan seedlings are planted on fallow land with economically important trees (fruits etc) and when the land is cleared for farmland, on a 10-15 years rotation, the cane can then be harvested and sold. A number of communities have expressed considerable interest in the cultivation of rattan and this might be an appropriate intervention in areas of cane scarcity caused by over-exploitation. Experimental work on incorporating rattan into farming systems is currently under way in Cameroon and is soon to be extended to Nigeria as part of the African Rattan Research Programme's activities in collaboration with Living Earth.

Recommendation: CRSCFP should identify pilot communities where rattan cultivation could be an appropriate intervention and collaborate with the African Rattan Research Programme on the establishment of community-based agroforestry trials.

5.4. Carpolobia alba & *C. lutea* **(Polygalaceae)**

cattle stick (vern.); **sanda** (Hausa); **agba** (Igbo)

5.4.1. Introduction

The two species of *Carpolobia* that are exploited for Hausa stick are almost impossible to tell apart in the field in the vegetative state. However, fertile, they can be distinguished relatively easily. *C. alba* possesses white flowers with a crimson spot at the base of the two uppermost petals and *C. lutea*, although also possessing white flowers, is characterised by a purple spot which turns orange-yellow at the base of the uppermost petals. There are also geographical differences, whilst *C. alba* is restricted to the forests of West Africa, *C. lutea* extends into the Congo basin. Both species are small trees to 5m high of the forest understorey.

Whilst traditionally used as a native torch in Cross River State (after stripping the bark, the dry wood will burn readily due to a high tallow-like substance in the wood) it is for its extremely hard, termite resistant stems that *Carpolobia* is valued. These stems are highly prized as cattle control by Hausa and Fulani herdsmen. The sticks also have some cultural importance and are also used widely in traditional marriage ceremonies as tools in "endurance test flogging" or *shario*.

5.4.2. Production-to-consumption system for Hausa stick

The harvest of *Carpolobia* sticks is undertaken almost exclusively by non-indigenes of the State and the entire production-to-consumption system is dominated by Hausa

and Fulani operators. Harvesting takes place both within forest reserves and community forest. In community forest, the system of access is somewhat informal with non-indigenous harvesters approaching individual communities requesting permission to enter the forest and collect. In addition to this direct approach, a less commonly encountered process known as "fronting" is also known to take place. This is a situation where indigenes of a community are paid as intermediaries by non-indigenes who then arrange with the Chief and Council for the harvest and collection of a set amount of *Carpolobia* (for example 1 lorry-load). In this latter case, the harvesting is usually undertaken by youths of the village. Whichever scenario is acted out, at this point an informal levy is paid to the community, usually directly to the Chief and the council.

The actual harvest of the stems is somewhat rudimentary and wholly unsustainable. The main problem is the fact that the stems are cut below the swollen root collar, which, it is said, produces a natural handle. The damage is so great that there is little or no prospect of regeneration through re-shooting, or coppicing. Coupled with this, the individuals preferred for harvest are adolescents with a dbh of 4-6cm hence many are removed before reaching reproductive maturity. The loss of these immature individuals seriously affects the population's long-term potential for recruitment through seed production.

Once cut to length (1.3m) and bundled, the sticks are then transported to the nearest road point. From there they are transported to Ikom, the sole amalgamation and distribution point in Cross River State; a definite cartel. At this point they are graded into uniform sizes and re-bundled. The next stage of the process entails transportation to Adamawa, Taraba, Kano and Kaduna where the sticks are "processed". This processing takes place in the north as the sticks are reportedly damaged when transported and leaving the bark on provides some basic protection. Actual processing consists of the removal of the bark, after first applying heat, and then allowing the bare sticks to dry slowly under tarpaulines. Some traders also smooth the sticks after drying through sanding. After this cleaning process, the finished sticks are further distributed. Fulani and Hausa cattle traders are very widely spread and the sticks harvested in Cross River State are supplied to northern Nigeria, Benin (Cotonou), Mali, Niger, northern Cameroon, Chad and across the desert as far as Libya.

It is important to note that, along with other forest products, *Carpolobia* does not pass through the periodic markets, reflecting the fact that there is no local demand for it in Cross River State and emphasised the level of control by the Hausa and Fulani cartel.

5.4.3. Sources of supply

The main exploitation areas for *Carpolobia* are Odukpani, Biase, Boki and Akamkpa LGA's. However because of complaints of scarcity, controls at both the community and official levels, many harvesters of Hausa stick are entering Cameroon and cutting extensively, primarily in the Takamanda Forest Reserve and its environs. Much of this material is transported down the Cross River by canoe and is landed in either Agbokim, and then transported by road, or directly to the beach at Ikom. In fact during this study, by remarkable coincidence, TS met with two Hausa stick harvesters were seen harvesting in the village of Mbu in Cameroon six weeks earlier unloading the very bundles they had transported from there.

5.4.4. Amount and value of the trade in Hausa stick

The sale of Hausa stick is extremely lucrative. A bundle of 50 sticks in Ikom is worth up to N 9,000, depending on quality (e.g. straightness, presence of knots). Due to the external nature of the final consumption it is very difficult to estimate the final market (retail) value. From reference to forestry records, it is recorded that, on average, 120 bundles of 50 or 75 stems leave Ikom every month, or around 1440 bundles annually. This represents around 72,000 to 108,000 individuals. The annual wholesale value of the trade in Hausa stick is thus estimated to be around N13 million.

5.4.5. Community-level controls and benefits

The main problem with community-based regulations for the harvest of *Carpolobia*, in common with other high-value NTFP's is that, as it is not used locally, there is a great deal of ignorance about its real value. This is reflected in the fact that there are few formal controls for access to the resource. As described above, it is commonly encountered that non-indigenes either pay the community for access to the resource themselves, or they liase with local collaborators who act as front-men for the operation. Small "taxes", either in cash or in kind, are paid to the community, usually directly to the Chief and the village council and the harvesters are then free to exploit the sticks. The amounts paid for access vary and for as little as N2,000 harvesters can remove quantities up to 150 bundles, each containing 50 stems. In one community visited, permission to harvest Hausa stick has been given after the village council was given two litres of palm wine and six bottles of beer. The fact that the harvesting and transportation is also dominated by outsiders means that local people do not often benefit even the from the provision of labour. In short, despite the high value of *Carpolobia*, very few benefits accrue to the communities in whose forest it is harvested.

5.4.6. Legislative controls and official tariffs

In contrast to the community-level lack of control for the *Carpolobia* resource, the Schedule 1 of the 1999 Forest Law does go some way in recognising the value of the commercial trade in Hausa stick. "Commercial", in respect to *Carpolobia* refers to four or more bundles and persons in possession of commercial quantities are required to be in possession of a permit to collect forest produce. The permit is issued per stick (N20) or per lorry load (N20,000). Further charges are made for evacuation from the State (Schedule 3); these are the equivalent of N1 per stick as well as an additional charge of N3,000 for per lorry. By the very nature of the *Carpolobia* cartel, it is left to the main agent in Ikom is responsible for the procurement of all the necessary collection permits and evacuation passes.

5.4.7. Overview of resource availability

The current harvesting methods and intensities for *Carpolobia* sticks are currently highly unsustainable and all those involved in the trade interviewed report local scarcity in most areas of Cross River State and hence the increased collection activities in Cameroon. The fact that the root collar is cut and damaged, along with the fact that the removal of future reproductive adults suggests there is little chance

for the recovery of an exploited population in the long-term. No assessment has been made of the regeneration potential of the two species under different harvesting techniques, nor of the potential for seed production of either species. If cultivation is a ecologically and economically viable, then community-based agroforestry schemes should be encouraged to ensure the greatest capture of benefits of this trade for Cross Riverians.

Recommendation: Propagation trials for *Carpolobia*, based on seed production, should be initiated, perhaps in the developing Calabar Botanic Garden. Close collaboration with communities and inclusion of the species into agroforestry systems through extension would ensure greater community participation and benefits of the harvest and sale of mature cultivated individuals.

5.5. Garcinia mannii (Guttiferae)

Igbo chewing stick (vern.); **osun ojie** (Boki); **okok** (Efik); **aku ilu** (Igbo)

5.5.1. Introduction

A slow-growing forest tree to 12m, *G. mannii* is characterised by a possessing a short bole and compact crown. The species is restricted to SE Nigeria and SW Cameroon, although it is also sporadically distributed in Equatorial Guinea and Gabon. The primary use of this species is for the production of chewsticks made from the split stemwood.

5.5.2. Production-to-consumption system for Garcinia chewsticks

The product is collected from the forest on demand from (usually non-indigenous) dealers in *Garcinia* who contract harvesters to undertake the felling and transportation of the logs. These harvesters may be indigenes of an area, or they may be outsiders. These dealers transport the billets to rural or urban depots where the products are purchased by a second group of dealer, or they may undertake the processing themselves. Interestingly, 98% of the processing dealers are women. The 5-6m long logs are then cross-cut using a chainsaw into standard lengths (4, 6 and 8cm) and then further processed in household "factories" which rely on manual splitting by cutlass. The split billets are shaved and cleaned before being packaged into large sacks for transportation. These 50 and 100kg sacks form the unit of trade through which another group of dealers market the finished products. Whilst it should be noted that indigenes of Cross River State account for less than 50% of the total number of people involved in the *Garcinia* trade, they account for 70% of the processors, a point in the chain where the benefits are highest (Omuluabi and Abang, 1994). This is a good example of how local processing can add value to a product for the benefit of local communities.

The main processing points for *Garcinia* are Agbokim, Uyanga and latterly, a number of small communities such as Iko Ekperem. The economy of Agbokim is considerably reliant on the processing of chewsticks and is the main supply point for Eastern Nigeria. There are currently 20-30 household "factories" in Agbokim and the production is conservatively estimated at 15-20 metric tonnes of finished chewsticks each week, representing around 360-400 raw *Garcinia* stems. The rainy season is a period of peak production as many remote creeks are then able to be accessed by

boat for the harvest of isolated populations of *Garcinia*. Formerly the Uyanga community in Akamkpa was heavily involved in the trade, but significant local scarcity through over-exploitation, has meant the majority of the local processing units have recently closed down. However, significant trade in *Garcinia* chewsticks still occurs there. Processing of *Garcinia* in Iko Ekperem is being undertaken on a small-scale basis only.

The wholesale trade in finished chewing sticks in undertaken outside of the central markets and the main clearing houses for processed *Garcinia* are concentrated in the Eastern part of Nigeria: Calabar, Uyo, Aba, Abakaliki, Enugu Port Harcourt and Owerri. The main wholesale dealers are, in the main non-indigenes, predominantly from Akwa-Ibom.

5.5.3. Sources of supply

Most *Garcinia* harvested in Cross River State originates in Ikom, Akamkpa and Boki LGA's. However, it is clear there is a fundamental problem with supply in Cross River State and most people involved in the trade suggest that there is very little harvestable *Garcinia* remaining in the State outside of the National Park. This is supported by the fact that the former major processing centre, Uyang, is now in decline. The main source of *Garcinia* logs is now Cameroon, and this explains the emergence of Agbokim in the trade of chewing stick in recent years. The logs are harvested from all along the border area, particularly in the Takamanda and Ejagham forest reserves and are transported by canoe to Agbokim. There is also a considerable supply of *Garcinia* logs by sea to Oron from the Mokoko forest in Cameroon (Sunderland and Tchouto, 1999).

5.5.4. Amount and value of trade

Omuluabi and Abang (1994) estimated that the collection and processing of *Garcinia* chewsticks employs as many as 6,000 people in Cross River State. Although the decline of the sector at Uyang might suggest that not quite as many people as this are engaged in the trade currently, it is clear that the *Garcinia* industry is highly lucrative, with substantial benefits accruing to indigenes of the State, particularly at the processing stage. The annual trade in *Garcinia* chewsticks is estimated to be 5,000 metric tonnes, with 90% of this being exported from the State. This represents an estimated wholesale value of N12 million.

5.5.5. Community-level controls and benefits

As the majority of *Garcinia* harvesters are generally non-indigenes and as the source of the extraction is often far from the point of processing, very little "access-value" is gained by the communities where the chewsticks are processed. However, the involvement of indigenes in the processing means that greater benefits are derived in to the natives of Cross River State, than from the harvest and export of many other forest products.

5.5.6. Legislative controls and official tariffs

The 1999 Forest Law regarding the collection of *Garcinia* is somewhat ambiguous. Although it is stated that a permit is required for collection, the required fees are set

at "N100 (up to 1.5m) or N10,000". The former figure is confusing as unprocessed logs are always up to 3-7m long. And, although not explicit, presumably the latter figure refers to a lorry load. The interstate transport fee applied to *Garcinia* chewsticks is set at N10 per billet or N25,000 per lorry load.

5.5.7. Overview of resource availability

Without doubt, the destructive nature of the harvest of *Garcinia* logs, coupled with the limited range of the species suggested that the species is under serious threat of local extinction. The small diameter of the logs currently being processed also indicates there is a problem with the extant population, with the majority of the individuals within the higher size classes, and hence those with the highest reproductive potential, already having been exploited. The species is already scarce in Cross River State, leading to the closure of a number of processing workshops and many harvesters are now procuring alternative sources of supply from Cameroon. Unabated and uncontrolled exploitation on the other side of the border will further expose the species to significant decline. To emphasise the overexploitation of the species in Nigeria, it should be noted that the stocking of *Garcinia mannii* is 2.8 stems per hectare in the forest reserves of Cross River State (Otu *et al*., 1994). However, the species occurs in densities of 7 stems per hectare in the Mokoko Forest Reserve where commercial exploitation has only recently begun (Sunderland and Tchouto, 1999).

Recommendation: The following strategies should be considered to avoid an immediate, and possibly irretrievable, decline in the populations of *Garcinia mannii*:

- Material which is currently wasted in the harvesting process, notably the branches, can also be utilised for chewsticks and should be collected and processed along with the main bole;
- Product substitution should be investigated. There are 23 commonly traded chewing stick species currently utilised in Nigeria (Isawumi, 1978). Some of these should be investigated as immediate substitutes for *Garcinia mannii*. Some substitution is already taking place in Cross River State with the harvest and sale of *Homalium* chewsticks.
- Cultivation through seed multiplication should be investigated for this species so alternative sources of supply can be developed;
- If exploitation continues at the current rate, and the population continues to decline, a moratorium should be declared, and enforced, on the harvesting of this species (i.e. it should be added to the Protected Species list).

5.6. *Massularia* (syn. *Randia*) *acuminata* (Rubiaceae)
***Randia* chewing stick** (vern.); **pako** (Yoruba)

5.6.1. Introduction

Massularia acuminata (formerly called *Randia*) is a shrub or small tree to 9m tall and is found in the understorey of high forest. The species is distributed from Guinea to Cameroon and Fernando Po, and extends into the Congo Basin. The twigs have a bitter taste and, despite having no recorded anti-bacterial activity, they are the most commonly-found chewing sticks in Nigeria. They are particularly favoured by

Yoruba's who appreciate the foaming action of the sap when the sticks are chewed. Smaller twigs are chewed whole, but the larger ones are split. Unlike many other chewing stick species, the bark is retained on this species.

5.6.2. Production-to-consumption system for Randia *chewing stick*

Cutting of the stems of *Randia* is undertaken in a similar way to that of *Carpolobia*, the main stems are cut at the base, although not below the root collar, and then further cut into lengths of 1m. The stems are then bundled and tied with ca.45 stems in each bundle, depending on the diameter.

Akin with the exploitation of *Carpolobia*, the harvest and sale of *Randia* chewing sticks is almost exclusively dominated by non-indigenes of Cross River State, however, mostly by Yoruba, Igbo and Ibibio dealers. Access to the resource is also achieved in a similar manner and a small payment, either in cash or in kind, to the community will secure collecting rights. However, there are some enlightened youths in some communities that have organised themselves into *Randia* collecting unions. For example, in Ekong-Anaku, it is forbidden for outsiders to harvest *Randia* and, in recognition of the value of the product, the cutting is undertaken by local youths. Final sale can take place either at the community, with outside buyers (mostly Igbo's and Yoruba's) purchasing directly from the harvesters, or will be transported by the community harvesters directly to the main wholesale market for *Randia* chewing sticks, Ijebu Ode near Lagos. The capture of the full benefits and value of *Randia* in this way has enabled the youths of this community to establish a highly efficient and impressive youth group; the Beyeni.

An estimated 95% of the *Randia* harvested is re-sold at Ijebu-Ode to primary processors who run small cottage industries, much along the lines of those for splitting of *Garcinia* chewing sticks. There, using circular bench saws, the logs are cross-cut into sections which are then split manually using cutlasses. The bark is retained, not only because of the belief that it contains active tooth protection ingredients, but also as a means of protecting the product from adulteration. Once split, the chewing sticks are then distributed for final sale.

5.6.3. Sources of supply

The main areas for *Randia* collection in Cross River State are the Ikom and Akamkpa LGA's. The villages along the Oban corridor provide gateways to the major supply of *Randia*. Agbokim seems to be the main importation point for *Randia* that is harvested in Cameroon, notably in and around the Takamanda Forest Reserve. Further material from Cameroon is imported by road at Mfum and also by canoe to Ikang and Oron, with the latter produce originating in the Mokoko forest area (Sunderland and Tchouto, 1999). Greater emphasis is being placed on material from outside Cross River State due to an increasing shortage of supply.

5.6.4. Amount and value of trade

Based on forestry records it is estimated that around 1,350 metric tonnes of *Randia* are exported from the State annually. This represents a wholesale value of around N90 million. The final revenues after processing and sale, however, are much greater.

5.6.5. Community-level controls and benefits

Aside from the occasional and temporary use of community members as labourers, very few benefits of this lucrative trade accrue to the communities where *Randia* is exploited. The registration of dealers often represents a mere token in respect to the final sale value of the chewing sticks. For example, in Iko Ekperem, this registration fee is N1,000 per lorry, plus the provision of drinks to the village council.

5.6.6. Legislative controls and official tariffs

The exportation of *Randia* sticks from Cross River State provides one of the major sources of revenue collection for the Forestry Commission. Permits to collect *Randia* in the State are issued at N20 per stick or N25,000 per lorry load. Further passes for evacuation (export) from the State are N20 for a bundle of 20 with an additional N3,000 for each lorry load. Restrictions also apply to the length of the stick; 1m is the maximum permitted length for each.

5.6.7. Overview of resource availability

Both harvesters and traders report the fact that the *Randia* resource is becoming increasingly scarce. This is characterised by the fact that harvesters are having to travel that much further into the bush to find mature stems, and also that large quantities now being imported from Cameroon. Whilst the species itself is relatively common where it occurs, up to 14 stems/ha have been recorded in Mokoko, Cameroon (Sunderland and Tchouto, 1999), the destructive harvesting technique is leading to a serious population decline.

Interestingly, after cutting, the exposed cambial layer between the bark and the sapwood begins to swell slightly. This is an indication that this callus might be a preliminary means of producing adventitious tissue and if planted, would differentiate into root development. If this is indeed the case, then it would be extremely easy to propagate this species through hardwood stems cuttings (taken from the branches which are often cut and discarded) and there would be a high potential for using this species as a live fence, for example.

Recommendation: Propagation trials of *Randia*, concentrating on multiplication by hardwood cuttings should be initiated. Close collaboration with communities and inclusion of the species into agroforestry systems through extension would ensure greater community participation and benefits of the harvest and sale of mature cultivated individuals.

5.7. Bushmeat

5.7.1. Introduction

The bushmeat resource is quite unlike any of the NTFP's discussed elsewhere in this report in that it is an umbrella term for a wide range of animal species captured and consumed. This resource represents the major source of protein for the majority of the rural communities in Cross River State and issues surrounding the regulation and control of bushmeat hunting is often a complex, and contentious, issue. In this

regard, the time allocated to do justice to the bushmeat issue during this survey was not sufficient to fully obtain a detailed overview of the sector.

For the purposes of this study, the information gathering was limited to the major mammal species hunted and traded and hence snails, periwinkles etc are excluded. The following species were encountered being traded in communities and markets during this survey and are also listed by Eniang and Ekpan, (s.d.) and Alexander and Effa (1994) as sources of bushmeat.

Common name	Latin name	Ecological preference
Cutting grass	*Thryonomys swinderianus*	Farm bush, secondary forest
Porcupine	*Atherurus africanus*	Secondary / high forest
Giant rat	*Cricetomys gambianus*	Compound gardens, farm bush,
Duikers (many spp.)	*Cephalophus spp.*	Secondary / high forest
Antelope	*Tragelaphus scriptus*	Secondary / high forest
Bongo	*Tragalaphus euryceros*	Predominantly high forest
Bush pig	*Potamochoerus porcus*	Secondary / high forest
Mangabey	*Cercocebus torquatus*	Predominantly high forest
Mona monkey	*Cercopithecus mona*	Secondary / high forest
Putty nose	*Cercopithecus nictitans*	Secondary / high forest
Preuss's guenon	*Cercopithecus preussii*	Predominantly high forest
Red-eared guenon	*Cercopithecus erythrotis*	Predominantly high forest
Drill	*Mandrillus leucophaeus*	Predominantly high forest
Buffalo	*Syncerus caffer*	Secondary / high forest
Elephant	*Loxodonta africana cyclotis*	Predominantly high forest
Monitor lizard	*Varannus niloticus*	Secondary / high forest
Nile crocodile	*Crocodylus niloticus*	Rivers and waterways
Dwarf crocodile	*Osteolaemus tetraspis*	Rivers and waterways
Python	*Python sebae*	Secondary / high forest
Gabon Viper	*Bitis gabonica*	Secondary / high forest

As with a number of other forest products, the sale of bushmeat makes a relatively significant contribution to household incomes. For example, in the Abu-Bashu communities, bushmeat contributed an annual average of N8,635, or 13% of the total annual income (Fripp, 2001). Despite this, it should be noted that although the trade in bushmeat is lucrative, a substantial proportion is sold and/or consumed within the community and does not enter the external market at any point.

The majority of hunting is undertaken using home-made rifles (or "Dane guns") that fire a single shotgun cartridge. The cost of cartridges incurs the greatest capital expenditure for hunters. However, there is evidence that western-made rifles and automatic weapons are also being used for commercial hunting. A large Bongo (*Tragalaphus euryceros*) was seen in the Ikom market during this survey with bullet holes made from a high velocity rifle. Outside of the military, it is unclear where such weapons could be obtained. Possibly, this represents a degree of organisation within the bushmeat sector not previously recorded.

Apart from the use of firearms, other hunters, usually youths, often prefer to set wire traps. However, in many communities there is some discord between the "shooters" and the "trappers", with many shooters complaining of the indiscriminate nature of

trapping and the high wastage. In particular, they complain that youths set too many traps that are not checked regularly and many animals die and rot before they can be harvested.

Recommendation: A separate and more comprehensive survey of the bushmeat sector of Cross River State should be undertaken. It is suggested that the CRSCFP could liase with Dr John Fa of the Jersey Wildlife Preservation Trust who is proposing to undertake a long-term study of the bushmeat markets of Cross River State, Nigeria and SW Province, Cameroon. With additional funding or on a consultancy basis, Dr Fa and his team could feasibly provide a more detailed overview of the productio-to-consumption systems for bushmeat and recommend more comprehensive development interventions.

5.7.2. The bushmeat chain of custody

The hunting of bushmeat is almost exclusively the occupational preserve of indigenes. Those non-indigenes actively hunting in Cross River State are, in the main, migrant farmers who have a long history of settlement in the area. The bushmeat trade has two very simple marketing chain models. The first begins with the hunter who sells his catch to specialised bushmeat sellers. The point of sale may be the central urban market, or if the buyer is a regular customer of the hunter, he or she will travel to the community itself to purchase meat. These bushmeat sellers may sell then directly to restaurants and hotels in the urban centres, or sell in central markets (both rural and urban). The specialised sellers also undertake preliminary or additional processing (smoking) prior to sale depending on the condition of the original purchase. Most prefer to purchase whole fresh animals that are then "quartered"; the market prices then vary according to size, species, quality and season.

The second system, or chain, may entail a middle man (or "contact hunter") operating between the forest-based hunters and the bushmeat sellers. This scenario is more common where the bushmeat source is particularly remote or inaccessible.

The majority of the bushmeat captured in Cross River State is consumed domestically and is not exported outside the State. A small proportion, however, is sold in Abakaliki and Makurdi in Benue State.

5.7.3. Processing of bushmeat

Whilst at the village level, the majority of the bushmeat consumed is fresh, the main form of processing for bushmeat is smoke-drying, and smoked meat accounts for the majority of the quantities traded. Smoking takes place at various locations. Older hunters, for example, who spend long periods of time hunting in the bush, will smoke and preserve the meat in bush houses themselves, often processing relatively large quantities. Other hunters will bring fresh meat for smoking at the village, and is often undertaken by their (mostly female) family members. The final scenario is smoking in the central markets when hunters bring fresh meat for sale. Surprisingly, marketing margins for smoked meat are much smaller than that for fresh meat, with the latter fetching far higher prices.

5.7.4. Sources of supply

The main sources of bushmeat are the forests of Oban, Boje, Bateriko, Akamkpa, Ikom, Obudu, Ogoja, Ugep and Obubura LGA's. Although many of the common species of bushmeat are hunted from farm bush and secondary forest (e.g. rodents), the larger mammals are hunted in high forest (e.g. primates and ungulates), notably within forest reserves and the Cross River National Park. In fact, evidence suggests that hunting within the National Park remains a significant activity for many community members reliant on the sale of bushmeat for their livelihoods.

A limited amount of bushmeat is also imported from Cameroon. This takes place through three main routes. The first route is originates in the Korup National Park the bushmeat is transported through forest paths to the community of Ekong-Anaku for subsequent sale in the bushmeat market in Aningije. The second route entails the head-portering of bushmeat over the Obudu Plateau from the Takamanda Forest Reserve which is then sold in the market of Amana. The third transportation route for bushmeat is through the community of Obonyi II, again from the Takamanda area. Most bushmeat dealers stated that this limited supply from over the border is due to the high perishability of the product, even when smoked, and the fact that there remains "plenty of bushmeat in Nigeria".

5.7.5. Amount and value of trade

In the absence of any recent market data, it is not possible to speculate on the amounts, or value, of the bushmeat traded each year within Cross River State. However, Omuluabi and Abang (1994), based on evacuation records, speculate that nearly 400 metric tonnes of bushmeat is exported annually from the State, with an (updated) estimated value of N7 million. In addition, a recent GTZ socio-economic survey of the Takamanda Forest Reserve may offer an estimate of bushmeat importation/value etc. into Nigeria.

5.7.6. Community-level controls and benefits

Non-indigenes are almost exclusively involved in hunting for bushmeat and control access to the forest for hunting by non-indigenes. It is unusual for communities to allow non-indigenes that are not integrated into the village to have hunting rights and access. In this regard, the production end of the chain is almost completely "indigenous". Despite this, the majority of the revenue accrued from the sale of bushmeat are concentrated at the wholesale level, which is dominated by both indigenes and non-indigenes. Interestingly, there are no recorded taboos or traditional restrictions on the hunting of bushmeat species.

5.7.7. Legislative controls and official tariffs

The 1999 Forest Law states that a permit is required to hunt or trap in forest reserves; this is set at N5,000 per annum. In practice, almost no-one is in possession of this permit. At the other end of the marketing chain, a permit is required for the sale of bushmeat. This permit costs N1,000 per annum. Again, the permit is rarely acquired, nor checked on.

Despite the fact that the animals listed above provide the bulk of the bushmeat trade, there is strong evidence that some Decree 11 (1995) endangered species are also being hunted and traded. In particular, it is estimated that, along with other recognised Decree 11 species, 3-4 elephants are killed each year in the Cross River National Park and the majority of the meat finds its way to the bushmeat markets, usually smoked and disguised as other species. There are unsubstantiated reports that this elephant hunting is being driven by the organised, and illegal, demand for ivory.

Recommendation: Greater enforcement of the Decree 11 schedule needs to be applied in order to halt the trade in endangered species. This is a particular problem within the forest reserves and the National Park, where the hunting of such taxa is reported to have a degree of organisation. Monitoring of the known bushmeat markets, particularly in Ikom and Calabar for Decree 11 species would also provide another means of control. In this latter regard, CRSCFP should liase with the research initiative of John Fa of the Jersey Wildlife Preservation Trust who is about to undertake long-term research on the bushmeat markets of SW Province, Cameroon and Cross River State Nigeria, building on his previous work in Equatorial Guinea. The results of the recommended investigations should be reported to the Commissioners, responsible for the Ministry of the Environment and for National Parks, before informing the Governor.

5.7.8. Overview of resource availability

In all areas of the State, there are increasing concerns about the current availability of bushmeat, particularly among the older hunters who remember times of relative plenty. Now, many complain that they can spend a week in the bush and still return empty-handed. This scarcity is affecting all species of hunted animal and whilst noted by the majority of hunters, many of them categorically state that the bushmeat "can never finish". This is obviously a nonsensical view; there has been a significant decline in faunal numbers over the years and local faunal extinction is a reported reality in some areas, particularly in Biase LGA. Whilst numerous attempts have been made to regulate hunting in many areas in West and Central Africa, few have been particularly successful; the fact that hunting continues in the Cross River and Korup National Parks, both well-funded conservation projects, is a case in point.

There is, however, a clear need to identify appropriate, and culturally acceptable, methods of control. An example of this is the Mokoko Wildlife Management Association (MWMA) in Cameroon (Olsen, *et al*., in prep.). The MWMA aims to manage hunting, limit access to the bushmeat resource by outside hunters and to improve the income of its members, both through hunting and through alternative source of forest-based activities. Hunting quotas are set and controlled for each bushmeat species using baseline population density estimates. These populations are monitored to determine the impacts of hunting over time; this allows for a re-adjustment of the quotas if necessary.

Domestication of certain bushmeat species has been widely advocated by many development agencies. However, beyond pilot schemes or demonstration units, there are few examples of community-based rearing of forest or grassland animals actually in place that can used as a model of acceptability. There is also no evidence that

community-based rearing of domestic animals will really reduce the pressure on wild sources of protein.

Recommendations:
- A domestication scheme for cutting grass has recently been introduced to Iko Essai, which is in its early stages. This scheme should be monitored to determine whether it will provide alternative sources of protein to hunted bushmeat, and if it is both technologically feasible and cost-effective;
- The FMC's should, with encouragement from the CRSCFP and the CRS National Park authorities, be made responsible for the implementation of the Decree 11 prohibition on the hunting of endangered species within their forest areas. A similar community-led moratorium on the hunting of gorillas and chimpanzees was recently declared in the Takamanda Forest Reserve, Cameroon with some success;
- Community-level controls aimed at ensuring that all hunters possess the appropriate permit to own a rifle, should be implemented;
- The bushmeat markets should be regularly monitored for the sale of Decree 11 species. The legislation restricting the sale of such species, and selling bushmeat without an appropriate permit should be upheld;
- There should be greater emphasis on the formal control of hunting, particularly within protected areas. Employing, and adequately remunerating, ex-hunters in this capacity have been proven in other areas to be an ideal means of enforcement. Many hunters interviewed during this survey stated they would gladly give up hunting if they had a viable alternative source of income;
- Community-level guidelines should be established on the setting of traps, particularly on limiting the number of traps per person;
- Information exchanges should take place between pilot communities in Cross River State, where hunting is a key economic activity (e.g. Ekong Anaku) and the Mokoko Wildlife Management Association.

6. OTHER WIDELY TRADED NTFP'S

The following list of species represents additional information collected during the market surveys and illustrates the economic importance of a wider range of NTFP's. The harvest and sale of many of these "less important" forest products is dominated by indigenes of Cross River State to whom the majority of the benefits of this trade accrue. Whilst a number of these species have additional uses throughout their range, only the main reason for sale is discussed in any detail.

6.1. Aframomum spp. (Zingiberaceae)

okpa (Igbo); **ntuen- Igbok** (Ibibio); **ntuen** (Efik)

Better known as "alligator pepper", the fruits and seeds of the *Aframomum* complex of species are widely sold and used as a condiment to flavour sauces and as a remedy for stomach ache and as a vermifuge. All species of *Aframomum* are rhizomatous herbs and are a characteristic component of secondary forest and roadsides. As such, the harvest and trade of Aframomum fruits cannot be considered unsustainable. It is important to note that, although a number of species within *Aframomum* are traded, the genus is currently under revision, and no species names are applied here.

6.2. *Annickia* (syn. *Enantia*) *chlorantha* (Annonaceae)
kakerim (Boki); **fever bark** (vern.)

A relatively common and widespread understorey tree of both secondary and high forest, the bark of this species is stripped and sold in many markets as a remedy for yellow fever and malaria. The bark is predominantly stripped from standing trees and the relatively low harvest intensity suggests that current levels of exploitation, coupled with the relative abundance of the species, cannot be considered unsustainable.

6.3. *Baillonella toxisperma* (Sapotaceae)
oko (Igbo); **efam** (Efik); **bojie** = stump, **edjie** = fruits (Boki); **moabi** (Trade); **njabe** (vern.)

An emergent tree occurring in both secondary and high forest, this is one of the few tree species in Cross River State that has both timber and non-timber values, particularly in the Boki region of the State where it is most commonly found. Due to the wide use of this species, it has been recently described as "vulnerable" by the IUCN and moves are being made towards implementing a moratorium of the export sale of moabi timber from Central Africa.

The timber of *Baillonella toxisperma* is relatively termite-proof, durable and heavy, and is often classed as a light-coloured mahogany. It is sought after by many timber harvesters and a number of small-scale operators are reported to exploit this species solely. However, the seeds also produce a high-value edible oil resembling shea butter. After thoroughly drying the nuts, the hard shells are removed manually. The exposed kernels are then ground finely on a stone and are spread out and moistened frequently with boiling water. The resulting mass is then manipulated into lumps or balls until the fat appears dark in colour. The oil extraction can also be undertaken by mechanical means through using a grinder too shred the kernels and a press for extracting the oil. The labour intensive nature of oil extraction makes the final product rather expensive and the oil is not so commonly found in markets, being more often used on a subsistence basis.

However, in the Boki area where the species is more abundant, "outside" timber permitees have removed many of the mature individuals nearer to the communities meaning that, in order to harvest the fruits, an occupation predominantly undertaken by women, further distances into the forest have to be travelled. These increased opportunity costs of collection, coupled with product substitution by groundnut oil, have led to a significant decline in the production of *Baillonella toxisperma* oil.

In Abu-Mpang where interviews with resource users were held, suggestions were made that timber exploiters should not be issued permits to harvest this species on community forest land especially where there is a strong tradition of oil production. This particular community was furnished with a mechanical grinder for processing the kernels by the previous ODA-assisted project to aid in the production of oil, which for some time enabled a significant quantity (up to a reported 1,000 litres / annum) to be produced for sale (at around N250 per litre). This grinder is no longer being used as during the late 1990's many of the moabi trees close to the community were felled by outside exploiters for timber.

Recommendation: Investigations should be made into the efficiency and acceptability of this form of mechanised processing and, if appropriate, identify other communities where *Baillonella toxisperma* is abundant that might benefit from the provision of such machinery.

Traditional resource tenure rights for moabi are relatively strong and some planting is being undertaken at the community level in farm fallows. Indeed the Ikom Charge Office has, since 1990, produced many thousands of *Baillonella toxisperma* seedlings for distribution to communities. However, it should be noted the original intention of planting, from the communities' perspective, was that the fruits would be harvested for the production of oil, whereas the distribution of seedlings by the FC was part of the programme for replanting *timber* species in community forest land.

Recommendation: Despite its value for timber (which normally benefits outside harvesters) the non-timber value of *Baillonella toxisperma*, the majority of which accrues at the community level (predominantly to women), greatly exceeds this and provides significant longer-term benefits. There is a clear conflict between this resource-use. It is recommended that *Baillonella toxisperma* is added to the Protected Species list in the current Forest Law (1999: B13). If this recommendation is adopted, the FMC's should be made immediately aware of this and ensure that this species should not be felled.

6.4. Cola nitida & *C. acuminata*
kola nuts

There is some confusion between the two main species of *Cola* that produce *Cola* nuts, *C. acuminata* and *C. nitida*, particularly as the fruits of both species are widely traded and have been cultivated on both subsistence and commercial scales for centuries. Originally, *C. nitida* was distributed in West Africa from Sierra Leone to Benin with the highest frequency and variability occurring in Ghana and Côte d'Ivoire; an area now accepted as its centre of origin. This area remained for long the only source of kola nuts to the African trade routes, with the majority of the nuts originating from wild populations. *C. acuminata* on the other hand, has its original wild distribution from Nigeria to Gabon. Around 1900, widespread cultivation of both species (due to the demand created by the beverage "Coca-Cola") led to the introduction of *C. nitida* as far as Zaire (now the Democratic Republic of Congo) and *C. acuminata* as far as Côte d'Ivoire. Hence, the distribution of these species has become significantly wider, and geographical distinction is a little blurred. The two species are morphologically very similar and the fruits are impossible to tell apart. Both are more naturally found in secondary forest and in the farm / forest interface, probably due to this history of cultivation and around Ikom, an area known for *Cola* cultivation, *Cola* is planted as a shade crop to cocoa and can be commonly found in home gardens.

Cola nuts can vary considerably in colour, ranging from white to dark red with a single tree often producing the full range of seed colours. Planted stock of *Cola acuminata*, which has undergone some selection by farmers, often produces fruit within five to seven years. Harvesting activities include the collection of fallen fruit

or by pulling down semi-mature fruits with hooks attached to long poles. The large green fruits are cracked at the harvesting site and the nuts are then transported back to the village where the thin outer seed coat is removed. Occasionally, if the nuts are to be transported a long distance, this seed coat is left on to be removed later by the market traders, or the nuts are wrapped in the leaves of *Hallea ciliata*. *Cola* nuts can be stored for up to two years if kept free from moisture.

The trade in *Cola* is particularly widespread with significant quantities of nuts being transported from the Cross River State to Kano and Kaduna in the north.

6.5. *Garcinia kola* (Guttiferae)
bitter kola (vern.); **oje** (Boki); **efiari** (Efik); **efiat** (Ibibio); **adu** (Igbo)

G. kola is a forest tree that is also commonly cultivated, particularly in the Boki area. The fresh seeds of bitter kola are widely chewed as a stimulant and are commonly seen in the markets. They are also traded outside the State in large quantities, but are not recorded in any of the formal forestry records.

6.6. *Hallea stipulosa* (Rubiaceae)
false opepe (vern.); **kechi-abibet** (Boki); **obulu** (Igbo); **ganyen goro** (Hausa)

A tree to 36m tall with a straight bole, this species occurs in both swamp-forest and savanna-forest and is widespread over tropical Africa. The broadly-elliptic leaves are widely used as a market-wrapper for kola nuts and to line baskets used to transport the nuts over short distances.

6.7. *Heinsia crinita* (Rubiaceae)
ata miri (Igbo); **atama** (Efik)

A scandent shrub more commonly found in secondary forest, *Heinsia crinita* is very widely distributed and ranges from Guinea throughout the Congo basin to East and Southern Africa. The leaves are plucked and eaten, particularly by the Efik and Igbo people and there is evidence of local cultivation of this species to supply the thriving market for atama leaves, particularly in the southern portion of the State. As such, there is no reported problem concerning over-exploitation.

6.8. *Lasianthera africana* (Icacinaceae)
editan (Efik); **kpurugiza** (Igbo)

An understorey shrub to 4m in secondary and high forest, *Lasianthera africana* occurs from southern Nigeria to northern DR Congo. The species often occurs in high concentrations with up to 86 stems per hectare found in Mokoko, Cameroon (Sunderland and Tchouto, 1999). Despite the presence of certain alkaloids and tannins, the leaves are used to make a soup, primarily by the Igbo's. However, this dish is spreading to other ethnic groups and bunches of editan leaves are now sold in many markets (N50 for one bunch). It is also reportedly used as an additive to afang soup, in the absence of, or in preference to, water-leaf (*Talinum triangulare*). Editan is one of the many products harvested and imported from Cameroon. It is transported by canoe from the Mokoko forest area, in SW Province, to the creek markets of Ikang (CRS) and Oron (Akwa-Ibom) from where it is further distributed, mostly to the Igbo-dominated areas. Whilst it could be concluded that due to the common nature

of the species in the wild and the relatively non-destructive harvesting methods, it is unlikely that there is a serious risk of over-exploitation of editan. However, the fact that relatively large quantities are being imported from Cameroon suggests that it has become scarce enough in southern Nigeria to warrant the additional costs of transportation, particularly of such a perishable product. *Lasianthera africana* grows readily from hardwood cuttings and is reportedly used as a live fence; hence there is some potential for this species to be included in community-based agroforestry systems.

6.9. Marantaceae wrapping leaves

The Marantaceae family is predominantly comprised of rhizomatous herbs, which are especially common in secondary forest, particularly along watercourses. A number of species within the Marantaceae are used as wrapping leaves and these include: *Thaumatococcus daniellii, Sarcophrynium brachystachys, Megaphrynium macrostachyum* and *Marantochloa* sp. The main outlets for the sale of wrapping leaves are the commercial food sellers, who purchase from the central markets. The leaves are highly perishable and as such, the majority of the trade is undertaken within the State. A bunch of 50-70 leaves generally sells for N50. The high concentrations of Marantaceae species especially within community forest, coupled with the relatively low impact of harvesting indicates there is little problem of over-exploitation. Alexander and Effa (1994) also report that some Marantaceae cultivation is practised in a number of farm gardens around Odukpani.

6.10. Monodora myristica & M. tenuifolia (Annonaceae)
African nutmeg (vern.); **eghuru** (Igbo)

Widespread throughout tropical Africa, *Monodora myristica* and *M. tenuifolia* are tree species predominantly found in the secondary forest and farm fallows. The aromatic seeds are sold all over the West and Central African region and are used, after grinding to a powder, as a condiment in food providing a flavour resembling that of nutmeg. The powder is also used as an aromatic addition to some medicines and to snuff. Once dried, the seeds can store for a long time. There are no reports of scarcity for this product.

6.11 Mucuna sloanei (Leguminosae)
horse-eye bean (vern.); **ibaba** (Efik); **agbala** (Igbo)

A climber 6-8m high, particularly of secondary forest, this species is widespread throughout the tropics. Ripe seeds widely sold in markets and are pounded and added as a flavouring to soups and stews. They are reported to provide a good source of protein. In Cross River State, the vine is known to be cultivated on tall poles as a climbing bean.

6.12 Pentaclethra macrophylla (Leguminosae)
African oil bean (vern.); **kenuri** (Boki); **ukana** (Efik); **ukpaka** (Igbo)

A common tree 20-35m tall of secondary and high forest, particularly in the vicinity of river banks. *Pentaclethra macrophylla* is also common in coastal forest. Although poisonous when raw, the dark brown disc-like seeds are sold for the production of a basic oil which is used, not only for culinary purposes, but for the local manufacture

of soaps, candles and for lubrication. The main period when the seeds are sold is the early rainy season, although the species fruits sporadically throughout the year. In clearing the bush for farming, this species is often retained and sometimes tended to the extent that the ground vegetation may be cleared to facilitate the collection of the shed seeds. Some farmers in Cross River State are also planting *Pentaclethra macrophylla*, and in places, it is encountered as a roadside tree.

6.13. Piper guineensis (Piperaceae)
bush pepper (vern.); **mfri** (Efik); **oziza** (Igbo); **adusa** (Ibibio)

A very widely distributed climber growing to 10m or more long. Bush pepper is widely retained on farms and trained on forest trees, and is also cultivated in home gardens. This species provides two main products; the spicy fruits used as a condiment and the leaves (hot leaf) used as an additive to soup. Both products are widely traded throughout Cross River State.

6.14 Pterocarpus osun & *P. soyauxii*
camwood (vern.); **padouk** (Trade); **boku** (Boki); **iduot** (Efik); **uha** (Igbo)

Both species of camwood are relatively abundant in the forests of S Nigeria and SW Cameroon and reach heights of up to 30m. Although very similar in appearance the species may be distinguished from the heartwood; that of *P. osun* is light to dark red and that of *P. soyauxii* is creamy-white. Although traded and sold predominantly for their valuable timber the sawdust of both species is widely traded as a dye for body decoration. The wood does not rot in water and, as such, is used for the construction of dug-out canoes. In the Ikang market, paddles camwood paddles are widely sold to fishermen plying the creeks.

The destructive NTFP use and the fact that it is a Class 1 timber species means that the *Pterocarpus* resource is under intense pressure from over-exploitation. Although the stocking densities are relatively high, particularly in the higher diameter size classes, up to 4 stems per hectare >10cm dbh, (Otu *et al*., 1994), the resource should be carefully monitored to determine the long-term impacts of exploitation.

6.15. Sacoglottis gabonensis (Humeriaceae)
ntala (Trade); **edat** (Boki); **edat** (Efik); **nche** (Igbo)

This is a tree of lowland forest, often found beside water, up to 40m or more in height and is widely distributed throughout tropical Africa. The major value of this species is as a timber and it is exploited for flitches in Cross River State by local chainsaw operators. However, the shaggy reddish-brown bark is also collected from both felled trees and standing trees, and transported to markets where it is sold, either in sheets or in rolls, as a bitter for adding to palm wine or gin to add flavour and potency. The main market for these products is Ekukunela on the Calabar-Ikom road. The presence of many dead *Sacoglottis* trees was reported during the inventory of NTFP's in Cross River State and coupled with low stocking (0.01 trees per hectare) and the harvesting of bark from standing trees is having a considerable impact on the existing population (Otu *et al*., 1994).

6.16. Tetracarpidium conophorum (Euphorbiaceae)
casu (vern.); **akan otoli** (Igbo)

A climbing shrub up to 10m long in forest. The fruits are highly seasonal and are sold in the markets as a snack.

6.17 Tetrapleura tetraptera (Leguminosae)
ebuk (Boki); **edeminang** (Efik); **ashobo** (Igbo)

A forest tree to 25m tall in forest, this species is widespread throughout tropical Africa. The fruits are widely sold predominantly as a condiment to make a black soup; they also have some medicinal value in the treatment of menstrual irregularities among other ailments.

6.18 Xylopia aethiopica (Annonaceae)
African pepper (vern.); **kenya** (Boki); **ata** (Efik); **uda** (Igbo)

A very widespread forest tree throughout tropical Africa, up to 20m tall or more with a clear straight bole. Despite widespread use of the bark elsewhere in West and Central Africa, the fruit is the most important part of the tree. Predominantly used as a spice and as flavouring for food, medicine and snuff, they remain an important item of local trade. The fruits, once dried, are able to be stored for some months. There are no reports of scarcity of this species.

7. *TRADITIONAL MEDICINAL PLANTS AND PRIMARY HEALTH CARE*

Aside from some stalls in the Watt market in Calabar and in Ikom, a surprising finding of this survey was the relative paucity of forest products sold for traditional medicine. This is in direct contrast to other parts of West and Central Africa where the sale of plants for health care is often well organised and highly lucrative. This situation is also reflected at the community level where the use of traditional medicines for primary health care seems to be somewhat limited. Almost all the informants interviewed at both the community and market levels stated that the upsurge in Christian Evangelism in Nigeria was actively discouraging the use of traditional medicinal practices. There is thus a greater reliance on Western-based pharmaceuticals or on "processed" traditional medicines that are packaged and marketed in the same way as their Western counterparts. In essence, particularly at the community level, traditional health care practices have become "a dying art".

8. THE EFFECTS OF SEASONALITY ON NTFP ACTIVITIES

Whilst many products are available for harvest and sale all year round, some are somewhat seasonal and the economic cycle for many communities rely heavily the timing of some forest resources. The following table summarises the effects of seasonality for the key forest products discussed in this report.

Table 2: Seasonality patterns for key NTFPs in Cross River State

Resource	Impacts of seasonality	Availability and notes
Bush mango	High	Wet season type (*I. gabonensis*) available June to September Dry season type (*I. wombolu*) available February to April;
Afang	Moderate	All year round, although less plucking and reduction in supply during early rains as people are more occupied with farming activities;
Rattan canes	Moderate	All year round, although transportation problems in rainy season restrict supply to markets;
Carpolobia cattle sticks	Low	All year round, although transportation problems in rainy season restrict supply to markets;
Garcinia chewsticks	Moderate	All year round, although increased availability in rainy season due to better boat access to remote creeks in forest;
Randia chewsticks	Low	All year round although transportation problems in rainy season restrict supply to markets;
Bushmeat	Moderate	All year round, although slight increase in bushmeat supply during the rainy season as animals are easier to hunt due to less likely to hear approaching hunters.

9. MARKETS AND NTFP TRADE

Market surveys provide an excellent means of determining the patterns of trade of particular forest products. However, it is important to note that markets differ widely in the provision of services, and exhibit a strongly hierarchical pattern of importance. It can be generalised that the greater the population, more people are attracted from greater distances to the marketing point. The proximity of major geographical features that facilitate access to the market (e.g. good road and river access) is also highly influential for the relative "importance" of each market. In Cross River State, the main markets through which a range of forest products are traded may be summarised as follows:

- *Central markets,* which are usually found at a strategic point in the transportation network where both wholesaling and retailing take place (e.g. Calabar, Ikom);

- *Cross border markets*, are situated at convenient (road, river and creek access), and often irregularly controlled, border crossings between Cameroon and Nigeria (e.g. Ikang, Ekang, Amana, Agbokim). These markets provide access to a wide wholesaler network for imported forest products, whilst being the exchange point for other marketed products from the central markets;

- *Standard markets*, which are the end point for the sale of imported items from larger settlements and where local exchange takes place. In Cross River State, these standard markets are often the starting point for forest products into the larger central markets (e.g. Aningeje, Ekong, Ekukunela, Bendeghe-Ekin);

- *Minor markets* also exist for the trade in forest products, but are mainly focussed on agricultural produce. No markets of this type were surveyed during this study.

Despite the fact that the majority of NTFP resources being traded within the formal marketing network, some are traded on an individual (i.e. single resource) basis. As noted above, this trading pattern particularly applies to *Carpolobia*, *Randia* and *Garcinia* chewsticks and rattan canes (aside from cane rope used for yam-tying) and reflects the fact that the majority of the trade in these products takes place outside the State.

Table 3: Summary of markets visited and products sold

Market	**Type**	**Major forest products sold (in rank order)**	**Market day**
Calabar (Watt)	Central	Afang, bush mango, bush meat, *Cola* nuts, bitter kola, *Garcinia* chewsticks (retail), editan, atama, many minor products	Every day (less on Sundays)
Ikom	Central	Afang, bush mango, bush meat, *Cola* nuts, bitter kola, *Garcinia* chewsticks (retail), editan, atama, many minor products	Every day (less on Sundays) although Thursdays & Saturdays main market days
Ikang	Cross-border	Editan, bush mango, afang, cane rope, mangrove roots, some minor products	Monday
Ekang	Cross-border	Afang, bush mango, bush meat, some minor products	Friday
Agbokim	Cross-border	Afang, bush mango, *Cola*, bitter kola, *Sacoglottis* bark, some minor products	Saturday
Amana	Cross-border	Bush mango, bush meat, afang	Every five days
Bendeghe-Ekin	Standard	Afang, bush mango, *Cola* nuts, bitter kola, cane rope	Saturday
Aningeje	Standard	Afang, bush mango, bush meat, some minor products	Saturday
Ekong	Standard	Afang, bush mango, some minor products	Wednesday
Ekukunela	Standard	Bush mango, afang, *Garcinia* chewsticks (retail) African oil bean	Sunday

10. *ISSUES OF SUSTAINABILITY AND ESTABLISHING HARVEST QUOTAS*

Despite the urgent need to determine what might be "sustainable" levels of harvest for the key NTFP resources of Cross River State there is, unfortunately, an immense shortfall in the knowledge of the basic biology and ecology of the majority of these species. In order for such estimates of sustainability to take place, knowledge on the population structure, abundance and distribution, regeneration and growth and reproductive patterns are needed for each resource. In addition, long term studies to determine the impacts of harvesting over time are also required. In short, there is a basic need for extensive inventories aimed at specific resources, estimates of the sustainable yield at both the individual and population levels, followed by long-term monitoring to determine the impact of harvesting on the regeneration and recruitment of the species concerned. However, given the fact that these activities require long-term funding and management commitment, there are very few examples of sustainable NTFP exploitation following this model anywhere in the Tropics.

Given this, it is not possible to provide quotas, nor estimates of what "level of sustainable production is feasible". However, it is possible to use the existing available information to assess the impact of current harvesting practices. In general, NTFP exploitation that is "non-destructive", for example the removal of the fruits of bush mango, can be described as relatively sustainable as long as there is evidence that the population is not declining over time through the constant removal of reproductive material. Destructive harvesting practices that are undertaken at low levels of exploitation, such as the removal of bark strips (e.g. *Annickia chlorantha*), may pose a threat to the individual, but not to the population or species as a whole. In this regard, bush mango and many of the other NTFP's traded in small quantities are not at immediate risk of being over-exploited and there are no reports of increasing scarcity of many of these products, nor price fluctuations indicating supply shortages.

On the other hand, destructive harvesting such as felling and removal, particularly at high intensities (often up to 100% removal) is wholly unsustainable. This over-exploitation can be exacerbated by a species occurring in low densities (e.g. *Sacoglottis gabonensis*) or by having a restricted natural distribution (*Garcinia mannii*). In this regard it not difficult to conclude that current levels of exploitation could feasibly lead to the extinction of the population and perhaps the species.

Table 4: Impacts of harvesting of key forest products and implications for sustainability

Resource	Life form	Part harvested	Impact of harvesting	Level of Sustainability
Bush mango	Canopy-emergent tree	Fruits	Low	**Relatively sustainable**; good regeneration and community-level cultivation;
Afang	Woody liana	Leaves	Low to medium to high (dependent on technique)	**Relatively sustainable** if leaves plucked and stem not cut, however destructive harvesting often undertaken and most harvesting hence **unsustainable**;
Rattan canes	Climbing palms	Mature stems	Low to medium	**Relatively sustainable** if mature stems cut only and cluster allowed to regeneration; however destruction harvesting is common and scarcity reported in some areas; hence unsustainable;
Carpolobia cattle sticks	Small to medium tree	Stems	High	**Highly unsustainable**, due to removal of whole stem including root collar
Garcinia chewsticks	Medium to large tree	Bole	High	**Highly unsustainable**; species has limited geographical range and in long-term danger of extinction;
Randia chewsticks	Small to medium tree	Stems	High	**Highly unsustainable**; population beginning to decline significantly
Bushmeat	Fauna	Whole organism	Moderate to high	Sustainability dependent on species concerned; general trend towards scarcity indicates **unsustainable** hunting.

11. *CULTIVATION AND COMMUNITY-BASED AGROFORESTRY*

Cultivation can often provide a long-term respite from the over-exploitation of certain forest resources if such an option is both economically and biologically feasible. It is also desirable that cultivation takes place within existing community-based farming systems in a manner that is both adoptable and economically rewarding.

It should be noted that the cultivation of these forest products is a long-way from their domestication. Domesticated plants are species whose breeding systems have been so changed through genetic or phenotypic selection that they have become dependent on sustained human assistance for their survival. The recommendations made in this report discuss developing cultivation techniques for those species whose harvest and sale contributes significantly to household incomes, but also those that are currently being significantly over-exploited.

Table 5: Cultivation potential of key NTFP's of Cross River State

Resource	Potential for cultivation
Bush mango	Grows readily from seed and already cultivated sporadically throughout Cross River State, particularly *I. wombolu*. Future work should be undertaken on selected of early-yielding varieties.
Afang	Propagates from stem cutting in low-technology mist propagators. Suitable for growing in compound gardens and high biomass yield makes cultivation economically feasible.
Rattan canes	Most rattan species grow well from seed, although germination times can be prolonged. As aroboreal climbers rattans need to grow on a tree framework and are ideal for agroforestry schemes. Commercial species have shown considerable promise in both silvicultural (under obsolete rubber) and community-based agroforestry trials in Cameroon. Only suitable in areas of significant over-exploitation.
Carpolobia cattle sticks	No current cultivation activity; need to investigate seed production potential.
Garcinia chewsticks	No current cultivation activity; need to investigate seed production potential.
Randia chewsticks	No current cultivation activity; need to investigate production from hardwood cuttings
Baillonella toxisperma	Grows readily from seed and is currently propagated and distributed by many Charge Offices in Cross River State.

There has been a relatively strong historical tradition of cultivation and distribution of timber species and fruit trees by the formal forestry services. Whilst this activity is currently constrained by limited investment, the majority of Charge Offices still have nurseries attached to them and they at least provide the necessary infrastructure for the possible implementation of a more comprehensive programme of cultivation for high value NTFP's. There is undoubtedly considerable scope for such an activity.

Recommendation: The status of the nursery infrastructure, as well as the skills capacity, for each Charge Office should be determined. A programme of training-for-trainers should be developed for the propagation and cultivation of the key NTFP's, and through the use of standard extension methods, community members could also be provided with the skills needed to cultivate many NTFP's for themselves. These training courses would be held at the Charge Offices and would target individual FMC's. Credit facilities for the development of local community nurseries, managed by the FMC's would further stimulate the development of cultivated systems.

The proposed development of the Calabar Botanic Garden could provide an excellent opportunity for the demonstration of the techniques for the cultivation of key NTFP resources. For example, demonstration plots of afang at the Limbe Botanic Garden have proved to be an excellent educational and training resource.

Recommendation: The possibility of establishing demonstration plots of key NTFP's resources (afang, rattan) within the Calabar Botanic Garden, should be investigated. The forthcoming planning workshop for the project (July 15th-22nd) will provide a good opportunity to evaluate the potential of such an educational tool.

12. PROCESSING AND TRANSFORMATION

With one notable exception, that of *Garcinia* chewsticks, the majority of primary processing for most forest products, and the point at which the greatest value is added, takes place at the (non-indigene) dealer level, rather than at the community level. For some products such as afang, primary processing is not feasible due to its perishability, but there is scope for the greater involvement at the community level for the processing of some key products. For example, it is simply nonsensical that bush mango is exported from the State to be dried and graded and then returned and sold back to Cross Riverians, particularly when the level of processing is somewhat rudimentary.

13. INSTITUTIONAL ISSUES

13.1. Introduction

Many people who harvest and sell NTFP's are generally from the "informal sector", that is they are essentially self-employed people, generally unrecognised in official statistics, have little access to capital and who earn money from labour-intensive enterprises. From the harvest to final consumption the domestic trade in NTFP's is generally part of the "hidden economy" of Cross River State, despite the considerable interstate and international trade in some products.

It is clear that the NTFP sector is a significant income generating activity for a wide range of rural and urban people. Capturing the benefits of this trade on a more formal basis would significantly change the manner in which these resources are perceived and managed. Indeed, ensuring that NTFP harvest and trade contributes to both rural and urban incomes, as well as to forest conservation is the centre of the discussion surrounding the entire sector. However, in Cross River State, as elsewhere, there need to be fundamental institutional changes to ensure that NTFP's can enter the formal trading, revenue and taxation system that applies to the timber resource, for example. These changes need to take place at both the community level and at the level of the Forestry Department.

13.2. Traditional resource control including benefits (by-laws etc)

The majority of communities in Cross River State have clear regulations surrounding the harvest of NTFP's from their forests. Regulatory controls of access for key resources such as afang and bush mango are particularly well developed and, in the main, across the State indigenes benefit significantly from the harvest and sale of

these resources, by generally excluding non-indigenes from the collection process. Communities such as Ekong-Anaku also impose large fines on outside parties who enter their forest to hunt or harvest bush mango without explicit permission. In addition, harvesters of other forest products, such as *Randia*, rattan, or *Carpolobia*, have to pay directly for access to the resource, with much of these funds contributing to the community purse. Likewise, dealers who purchase certain NTFP's directly from community collectors also pay to register with the community. In this regard, the fact that both harvesters and dealers have to pay for access to these resources, and the funds contribute directly to the community purse, is an encouraging sign that an effective institutional structure is in place that is able to regulate access to, and benefit from, the harvesting of key NTFP's.

Although this structure is in place, what is clear is that the proportion of benefits that accrue to the communities of origin is but a small fraction of the final sale price of these products. This applies both for those products that are marketed domestically and for those exported from the State. Whilst community members are often involved at the collector level for most forest products, very few are involved as the products move along the marketing chain, and hence the majority of the benefits from the final point-of-sale for many NTFP's accrue mostly to non-indigenes. Surprisingly, this is even the case for products with high domestic markets such as afang and bush mango.

One of the main reasons for the lack of indigenous involvement along the marketing chain is that most communities do not have a realistic notion of the true market value of some forest products, particularly those products that are predominantly exported from the State (*Randia*, *Carpolobia* etc). In this regard, access to the resource base, or the resource itself, is often unknowingly undersold to outside harvesters or dealers, with many communities, at best, benefiting from the provision of labour. Omuluabi and Abang (1994) confirmed this by studying the marketing margins for many NTFP's. They found that those products being exported from the State have, by far, the highest margins; this is because, amongst other things, access is provided for a tiny fraction of the final value. In order to access the marketing chain, many indigenes would need access to capital and the Living Earth approach in developing micro-credit schemes to promote this would be extremely applicable elsewhere in the State.

Recommendation: In essence, the marketing chain for many products needs greater "indigenisation", which would hopefully ensure a greater community share of the revenues generated by NTFP's. Access to credit facilities to generate capital in order to break into the marketing chain in this manner would provide this opportunity for many community-based harvesters and traders.

However, an interesting case study in how greater community involvement in the trade of a particular forest resource has contributed to the development of the community itself was witnessed in Ekong-Anaku.

Box 1. The Beyeni of Ekong-Anaku

The Beyani Progressive Movement of Ekong-Anaku is a "socio-cultural cum philanthropic organisation" which is comprised of 53 youth members, both male and female. The association provides welfare and development support for members of the community (non-indigenes are excluded), such as the provision of loans for business ventures and provides a level of local social security for those in need (school fees, medical bills). Income to support the association is generated primarily from the harvest and sale of *Randia* chewsticks, which was formerly harvested solely by outsiders (mostly Yoruba's). However, the community became aware of the value of the resource and decided the harvest the stems themselves and to sell them at a realistic price, either to Yoruba buyers who come to the village, or transport them directly to Ijebu-Ode. The latter option is preferred as it captures and greater proportion of revenue. Significant revenue is also raised by charging transporters travelling through the village between Cameroon and Nigeria the sum of N100 each way. Interestingly, many of these transporters are carrying forest products from Cameroon and return carrying Nigerian plastic, electrical and pharmaceutical products. The annual income of the Beyeni Association is reputed to be N5 million; much of which originates from the sale of *Randia* alone. Whilst not doing much for the conservation of the *Randia* resource, which is said to be diminishing, the control of the market in this way has significantly contributed to the development of the community. The idea is now spreading through the Ekon clan, of which Ekong-Anaku is a part; it is a model perhaps for other communities in Cross River State to emulate.

Local by-laws that apply to the harvest of some products also show that the communities are able to control and monitor the *manner* in which some resources are harvested. For example, the fact that bush mango trees are not permitted to be climbed or felled, or that, in some areas, afang stems are not to be cut during harvest, shows that there is some consideration for the long-term status of the resource. In general, these by-laws are said to be respected (although the afang case is probably not as easy to control) and could possibly provide the means to control the over-exploitation of other forest resources (for example, by not allowing timber harvesters to fell *Baillonella toxisperma*). In this regard, it is surprising that, unlike the Takamanda area, there are very few by-laws or restrictions on the hunting of certain animals, particularly primates. Use of these by-laws is an effective means of establishing community-led controls for the harvesting of certain forest resources.

13.3. Legislation and the Forestry Commission

Traditionally, the forestry sector has put particular emphasis on the timber resource of Cross River State and timber is still being regarded as the major contributor to the economy of the State. Although the estimated total revenues from NTFP's are estimated to have an equivalent value to, if not greater, than that of timber the fact that these revenues do not filter into the formal forestry sector perpetuatess the misconception that timber has more "value".

Despite the inherent contradictions within the forestry tariff highlighted by Günding, (2000), there is some provision for the formal collection of NTFP revenues. For

example, Schedule 1 of the forestry tariff lists all the products for which levies are raised through the issue of collection permits whilst Schedule 3 relates directly to the transportation and evacuation of forest products. However, there is still a particular emphasis on timber products and, whilst some key NTFP's are also included on the list, there are inconsistencies, especially with regard to assessing the quantities for setting tariffs.

The amount received by the Forestry Commission for the permit is divided into two portions; that paid to the State government as a fee, which then counts towards a departmental revenue target, and the royalty, which is paid to the community. This payment by the government is regarded as compensation it is making to the "true" owner of the resource. In his recent review of the forestry legislation (Günding, 2000), stated that many NTFP harvesters wanted to propose that no permit or levy fees should be applied to these resources. Sensibly, however, the report concluded that implementing this proposal this would only encourage over-exploitation whilst no revenues would be generated from such resource use. The report also stressed the need for the implementation of the penalty scheme for non-compliance and violations of the Forest Law. The current system; a fine of N20,000, or an [unspecified] period of imprisonment is considered by most as an appropriate level of punishment, although it is not applied as often as it might be.

In general, Schedule 1 refers to produce that is extracted from the forest reserves or forest plantations, and particularly as the origin of produce is not often specified, it is unclear to what extent material is harvested from community forests. However, for many products the origin is not specified and, by implication, levies should then also be accrued for many products originating in community forests, as well as for forest reserves. The fact that this is not the case, coupled with the issue of very few permits suggests there is very little formal revenue collection from these resources and hence very little in respect of royalty payments is paid to the communities of origin. This is despite the significant quantities of NTFP's being traded. Unsurprisingly, the majority of permits issued are for those products generally harvested by non-indigenes and are then exported from the State.

The majority of communities are unaware of the details of the permit system and are often somewhat cynical about their ability to benefit from royalties through the exploitation of NTFP's. Most express considerable surprise that harvest of such products by outsiders should be accompanied by a legal, and current, permit specifying which species and in what quantity should be harvested. This lack of awareness at the community level is unfortunately compounded by the manner in which NTFP's are dealt with at the level of the Forestry Commission. Most field staff do not keep accurate and consistent records of transactions involving NTFP's. Many also complain that controlling the trade in NTFP's is difficult as it is not easy to distinguish between commercial trade of particular produce and situations where traders do not have free rights of access to the produce (as opposed to indigenes harvesting from community forests).

Box 2. Community rights in forest reserves

The Forest Law and Regulations of 1956 make specific mention of the range of rights communities have with regard resource use within forest reserves. These are still respected in the 1999 Forest Law and rights reserved for communities are:

- to hunt and fish;
- to collect the produce of the wild oil palm;
- to tap and collect the products of the wild oil palm;
- to collect the fruits of specifies species;
- to collect canes and bush ropes;
- to collect snails and tortoises;
- to receive royalties on tree felled within the reserve.

Unlike with timber where the unit of trade is consistent, the units of sale of NTFP's vary according to the product. In addition, the fact that the Schedule is somewhat ambiguous regarding formal quantities of NTFP's, means that, unlike the timber resource, there is often personal interpretation on the part of Charge Officers on what constitutes quantity, quality and the source of the martial, and hence what levies should be set. Such inconsistencies often result in the permit system, at best being poorly controlled and enforced and, at worst, not being adhered to at all.

Recommendation: The permit issue and evacuation records that are kept, whilst not providing an accurate estimate of quantity and value, do provide a useful overview of trends with regard to the interstate trade of NTFP's in particular. However, the form of data management, both for timber and non-timber resources is woefully inadequate (paper files that are prone to loss and damage). It is strongly recommended that the Statistics and Planning Branch of the Forestry Commission is provided with computer facilities and subsequent training to enable them to database the permit data for easy access and analysis.

In general, the effective capacity of the Forestry Commission Charge Offices to undertake the full range of their responsibilities is poor. Many Offices do not have access to transport facilities nor do they have an operating budget, which may be used for control and enforcement of the forestry legislation. There is an urgent need to develop the institutional capacity of the Forestry Commission, particularly at the Charge Office level.

Because of the absence of the forestry officers from checkpoints, many NTFP harvesters and dealers complain that other formal services such as the police, the military and local council officials, often collect unofficial levies, thus diverting a potentially important source of revenue from the formal forestry sector. In fact, this unofficial taxation has been the cause of considerable complaint, particularly amongst collectors of *Carpolobia* (see Appendix 2).

Recommendation: The current institutional strengthening of the Forestry Commission should include a review of the unofficial application of levies by other services, which would normally accrue to the forestry sector. It should be ensured that the appropriate mechanisms are in place that permit forestry staff alone to collect forestry-related revenues.

One aspect of the trade in NTFP's that has been relatively neglected in previous assessments of the sector is that of the importance of the cross-border trade between Nigeria and Cameroon. Not only is this trade not monitored or regulated on any official basis, but potentially important revenues through the collection of import taxes are not collected.

Recommendation: It is proposed that the Charge Offices at the major border-crossing points are responsible for the collection of appropriate import taxes from the transportation and trade of NTFP's. This would entail developing a system of taxation that reflects a proportion of the total value of the consignment and would be set according to the quantity. After payment of the tax, the transporter would be issued with a pass that allows him/her to carry the consignment to the final point of sale, without, ideally, being disturbed by other government services. The concept here is that most transporters are willing to pay for the movement of goods (hence the payments into the informal sector) and this would provide a good means of capturing such revenues in a formal manner, to the benefit of the Forestry Commission. A scheme such as this operates on the border between Cameroon and Gabon where a similar thriving trade in NTFP's takes place. A forthcoming consultancy by the primary consultant for GTZ/MINEF on the Cameroon side of the border would investigate the opportunities for control and export taxation by the Cameroonian forestry department. There is scope for considerable cross-border co-ordination of control and revenue collection from the NTFP trade in the immediate future.

13.4 Forest Management Committees and NTFP's

The recent innovation of establishing community-based forest management committees is a significant advance in developing the local capacity to manage and benefit from exploitation of forest resources. However, whilst there are specific regulations for the NTFP sector at both the community and legislative levels, it is clear that the Forest Management Committees need to have a greater awareness of the value and control of these particular resources. From initial observations, it is clear that FMC's consider themselves to be guardians of the timber resource alone and hence do not consider they have a particular role to play in the regulation and revenue collection from NTFP's. Indeed, during the majority of the community and FMC meeting held during this survey, the consensus was that timber was the most valuable forest product and hence that is what FMC's feel that this is what they should concentrate on regulating. In many respects, this may have as much to do with the traditional emphasis on timber by forestry officials, than any shortfall in the commitment of the FMC's to include NTFP's into their remit.

In fact, it would be with little difficulty that NTFP's could indeed to included within the management role of the FMC's, particularly given the fact that the majority of

communities already possess rudimentary institutional structures that control and regulate access to these resources. What is surprising, in this regard, is that these NTFP regulatory institutions operate within the existing traditional structures of the communities, whilst the FMC's generally seem to be regarded as outside of these traditional institutions. This is very clearly illustrated when, during village meetings, not one of those interviewed mentioned the FMC within the context of the traditional institutions of the community. In fact even the Bayeni Association of Ekong-Anaku operates outside of the formal FMC despite the fact that it generates the majority of its income from forest resource exploitation. It is clear then, that for a more holistic approach to forest management, the FMC's need to be far more closely aligned with the traditional institutions of the community, particularly those that are involved with the regulation of NTFP's.

Recommendations for the development of the institutional capacity of FMC's:

- The majority of communities are not aware of their legal rights with regard to the Forest Law and Statutes, particularly for those NTFP's with no tangible domestic market exported and are hence not able to implement what restrictions on harvesting that might exist for these species. The Forestry Commission has a role to play in educating FMC's on their rights with regard to access to NTFP resources. A booklet along the lines of that of the "Single Tree Permit Guidelines", outlining the regulations surrounding NTFP exploitation would provide an extremely useful means of imparting this information. The leaflet should also make FMC's aware of the real value of selected high-value NTFP resources to avoid access being undersold;
- NTFP's should be specifically and explicitly mentioned in the FMC constitutions. This would ensure that the existing systems of NTFP control and regulation are incorporated into the FMC remit;
- Once communities are aware of the rules and regulations surrounding NTFP exploitation, it should be possible to introduce a system of standardised community-level tariffs and registration fees for many forest products for the FMC's to monitor and control. Forest gates, such as those in Ekong-Anaku and Danare have proved to be an effective means of controlling forest product movement as well as providing an important source of revenue;
- Aside from bush mango, NTFP's are not currently included in the forest management plans currently being developed with pilot FMC's. This should be reviewed and a number of other key NTFP resources should be explicitly included in the planning process;
- As information becomes available, ecological guidelines for the sustainable exploitation of certain NTFPs should be developed. Some of these regulations are in place (e.g. do not cut afang stems, do not cut or climb bush mango) and should be formally incorporated into the FMC regulatory framework.

14. SUMMARY OF RECOMMENDATIONS

14.1. Bush mango

- A number of pilot communities should be identified for whom this low technology drying technique would be appropriate. Ideally, these would be communities who are actively involved in the cocoa trade and who would additionally benefit from

being able to also dry and store this product more efficiently. The CRSCFP could fund the establishment 3-5 of these model drying facilities in collaboration with key FMC's;

• CRSCFP should monitor the Living Earth proposed bush mango micro-credit scheme for Danare and Abontakon and, if appropriate, identify suitable FMC's for pilot micro-credit support to facilitate community-level drying and storage;

• Community-level options for the grading and marketing of bush mango should be investigated. In this regard, it might be appropriate for Dr Ladipo to undertake a short consultancy to advise on the modalities and potential benefits of implementing such a system;

• A programme for the seed propagation and planting of improved cultivars for bush mango should be developed in collaboration with Jonathon Okafor, ideally building on the activities of the previous project. Emphasis should be made on the integration of bush mango with other economic activities (cocoa planting, other tree crops);

• To determine the sustainability of the bush mango resource, a long-term ecological study of both species of bush mango should be initiated. Of particular interest would be knowledge of the pollination biology of each species, including the reasons for masting, fruit yields, seed dispersal, and patterns of mortality and recruitment. This would not necessarily be within the direct remit of the CRSCFP, but collaboration might be considered between the FC and a Nigerian academic institution for which funds could be made available for a structured, and well-supervised, PhD programme.

• Along with *I. gabonensis , Irvingia wombolu*, the dry-season, or bitter, bush mango should also be included on the list of Protected Species in a future revision of the Forest Law;

14.2. Afang

• CRSCFP should develop optimum guidelines for the harvest of certain NTFP's particularly afang. For this resource, these guidelines would include prohibition of felling trees for access to the stem, pulling down, and breaking the stem itself, or up-rooting the individual; leaves should be plucked only. The FMC's would ideally be responsible for the implementation and enforcement of these guidelines;

• Community-based training in afang cultivation should be introduced to pilot communities in Cross River State. This work should be undertaken in close collaboration with the Limbe Botanic Garden, Cameroon who have developed low-technology methods of bulk propagation for afang and extended this technology to a wide range of target communities. Initial trials indicate that the potential yields, and incomes, are substantial;

14.3. Rattan canes

• CRSCFP should begin to identify community-based artisans who are actively involved in rattan work who would benefit from the proposed training in improved rattan processing and transformation which will take place in February of next year. Additional support funds, through micro-credit provision, could be made available for pilot communities to establish their own low technology processing units for them to supply the large urban artisan markets with semi-processed cane (i.e. oil cured but un-transformed into final products). This would be particularly appropriate for communities that are resource-rich in rattan and who currently receive very little benefit from the exploitation of this high value forest resource (for example Ekong-Anaku);

• CRSCFP should identify pilot communities where rattan cultivation could be an appropriate intervention and collaborate with the African Rattan Research Programme on the establishment of community-based agroforestry trials;

• To ensure the correct resource base is being adequately controlled, the names *Laccosperma* and *Calamus* should be replaced by in future revisions of the Forest Law by "large-diameter, >1cm" and "small-diameter, <1cm" canes respectively.

14.4. Hausa stick

• Propagation trials for *Carpolobia*, based on seed production, should be initiated, perhaps in the developing Calabar Botanic Garden. Close collaboration with communities and inclusion of the species into agroforestry systems through extension would ensure greater community participation and benefits of the harvest and sale of mature cultivated individuals.

14.5. **Garcinia** *chewing stick*

The following strategies should be considered to avoid an immediate, and possibly irretrievable, decline in the populations of *Garcinia mannii*:

- Material which is currently wasted in the harvesting process, notably the branches, can also be utilised for chewsticks and should be collected and processed along with the main bole;

- Product substitution should be investigated. There are 23 commonly traded chewing stick species currently utilised in Nigeria (Isawumi, 1978). Some of these should be investigated as immediate substitutes for *Garcinia mannii*. Some substitution is already taking place in Cross River State with the harvest and sale of *Homalium* chewsticks;

- Cultivation through seed multiplication should be investigated for this species so alternative sources of supply can be developed;
- If exploitation continues at the current rate, and the population continues to decline, a moratorium should be declared, and enforced, on the harvesting of this species (i.e. it should be added to the Protected Species list).

14.6. **Randia** *chewing stick*

• Propagation trials of *Randia*, concentrating on multiplication by hardwood cuttings should be initiated. Close collaboration with communities and inclusion of the species into agroforestry systems through extension would ensure greater community participation and benefits of the harvest and sale of mature cultivated individuals.

14.7. Bushmeat

• A separate and more comprehensive survey of the bushmeat sector of Cross River State should be undertaken. It is suggested that the CRSCFP could liase with Dr John Fa of the Jersey Wildlife Preservation Trust who is proposing to undertake a long-term study of the bushmeat markets of Cross River State, Nigeria and SW Province, Cameroon. With additional funding or on a consultancy basis, Dr Fa and his team could feasibly provide a more detailed overview of the productio-to-consumption systems for bushmeat and recommend more comprehensive development interventions;

• Greater enforcement of the Decree 11 schedule needs to be applied in order to halt the trade in endangered species. This is a particular problem within the forest reserves and the National Park, where the hunting of such taxa is reported to have a degree of organisation. Monitoring of the known bushmeat markets, particularly in Ikom and Calabar for Decree 11 species would also provide another means of control. In this latter regard, CRSCFP should liase with the research initiative of John Fa of the Jersey Wildlife Preservation Trust who is about to undertake long-term research on the bushmeat markets of SW Province, Cameroon and Cross River State Nigeria, building on his previous work in Equatorial Guinea. The results of the recommended investigations should be reported to the Commissioners, responsible for the Ministry of the Environment and for National Parks, before informing the Governor;

• A domestication scheme for cutting grass has recently been introduced to Iko Essai, which is in its early stages. This scheme should be monitored to determine whether it will provide alternative sources of protein to hunted bushmeat, and if it is both technologically feasible and cost-effective;

• The FMC's should, with encouragement from the CRSCFP and the CRS National Park authorities, be made responsible for the implementation of the Decree 11 prohibition on the hunting of endangered species within their forest areas. A similar community-led moratorium on the hunting of gorillas and chimpanzees was recently declared in the Takamanda Forest Reserve, Cameroon with some success;

• Community-level controls aimed at ensuring that all hunters possess the appropriate permit to own a rifle, should be implemented;

• The bushmeat markets should be regularly monitored for the sale of Decree 11 species. The legislation restricting the sale of such species, and selling bushmeat without an appropriate permit should be upheld;

• There should be greater emphasis on the formal control of hunting, particularly within protected areas. Employing, and adequately remunerating, ex-hunters in this

capacity have been proven in other areas to be an ideal means of enforcement. Many hunters interviewed during this survey stated they would gladly give up hunting if they had a viable alternative source of income;

• Community-level guidelines should be established on the setting of traps, particularly on limiting the number of traps per person;

• Information exchanges should take place between pilot communities in Cross River State, where hunting is a key economic activity (e.g. Ekong Anaku) and the Mokoko Wildlife Management Association.

14.8. Moabi

• Investigations should be made into the efficiency and acceptability of this form of mechanised processing and, if appropriate, identify other communities where *Baillonella toxisperma* is abundant that might benefit from the provision of such machinery;

• Despite its value for timber (which normally benefits outside harvesters) the non-timber value of *Baillonella toxisperma*, the majority of which accrues at the community level (predominantly to women), greatly exceeds this and provides significant longer-term benefits. There is a clear conflict between this resource-use. It is recommended that *Baillonella toxisperma* is added to the Protected Species list in the current Forest Law (1999: B13). If this recommendation is adopted, the FMC's should be made immediately aware of this and ensure that this species should not be felled.

14.9. Conservation through cultivation

• The status of the nursery infrastructure, as well as the skills capacity, for each Charge Office should be determined. A programme of training-for-trainers should be developed for the propagation and cultivation of the key NTFP's, and through the use of standard extension methods, community members could also be provided with the skills needed to cultivate many NTFP's for themselves. These training courses would be held at the Charge Offices and would target individual FMC's. Credit facilities for the development of local community nurseries, managed by the FMC's would further stimulate the development of cultivated systems;

• The possibility of establishing demonstration plots of key NTFP's resources (afang, rattan) within the Calabar Botanic Garden, should be investigated. The forthcoming planning workshop for the project (July 15th-22nd) will provide a good opportunity to evaluate the potential of such an educational tool.

14.10. Traditional resource control

• In essence, the marketing chain for many products needs greater "indigenisation", which would hopefully ensure a greater community share of the revenues generated by NTFP's. Access to credit facilities to generate capital in order to break into the marketing chain in this manner would provide this opportunity for many community-based harvesters and traders.

14.11. Legislation and the FC

• The permit issue and evacuation records that are kept, whilst not providing an accurate estimate of quantity and value, do provide a useful overview of trends with regard to the interstate trade of NTFP's in particular. However, the form of data management, both for timber and non-timber resources is woefully inadequate (paper files that are prone to loss and damage). It is strongly recommended that the Statistics and Planning Branch of the Forestry Commission is provided with computer facilities and subsequent training to enable them to database the permit data for easy access and analysis;

• The current institutional strengthening of the Forestry Commission should include a review of the unofficial application of levies by other services, which would normally accrue to the forestry sector. It should be ensured that the appropriate mechanisms are in place that permit forestry staff alone to collect forestry-related revenues;

• It is proposed that the Charge Offices at the major border-crossing points are responsible for the collection of appropriate import taxes from the transportation and trade of NTFP's. This would entail developing a system of taxation that reflects a proportion of the total value of the consignment and would be set according to the quantity. After payment of the tax, the transporter would be issued with a pass that allows him/her to carry the consignment to the final point of sale, without, ideally, being disturbed by other government services. The concept here is that most transporters are willing to pay for the movement of goods (hence the payments into the informal sector) and this would provide a good means of capturing such revenues in a formal manner, to the benefit of the Forestry Commission. A scheme such as this operates on the border between Cameroon and Gabon where a similar thriving trade in NTFP's takes place. A forthcoming consultancy by the primary consultant for GTZ/MINEF on the Cameroon side of the border would investigate the opportunities for control and export taxation by the Cameroonian forestry department. There is scope for considerable cross-border co-ordination of control and revenue collection from the NTFP trade in the immediate future.

14.12. Forest Management Committees

• The majority of communities are not aware of their legal rights with regard to the Forest Law and Statutes, particularly for those NTFP's with no tangible domestic market exported and are hence not able to implement what restrictions on harvesting that might exist for these species. The Forestry Commission has a role to play in educating FMC's on their rights with regard to access to NTFP resources. A booklet along the lines of that of the "Single Tree Permit Guidelines", outlining the regulations surrounding NTFP exploitation would provide an extremely useful means of imparting this information. The leaflet should also make FMC's aware of the real value of selected high-value NTFP resources to avoid access being undersold;

• NTFP's should be specifically and explicitly mentioned in the FMC constitutions. This would ensure that the existing systems of NTFP control and regulation are incorporated into the FMC remit;

• Once communities are aware of the rules and regulations surrounding NTFP exploitation, it should be possible to introduce a system of standardised community-level tariffs and registration fees for many forest products for the FMC's to monitor and control. Forest gates, such as those in Ekong-Anaku and Danare have proved to be an effective means of controlling forest product movement as well as providing an important source of revenue;

• Aside from bush mango, NTFP's are not currently included in the forest management plans currently being developed with pilot FMC's. This should be reviewed and a number of other key NTFP resources should be explicitly included in the planning process;

• As information becomes available, ecological guidelines for the sustainable exploitation of certain NTFPs should be developed. Some of these regulations are in place (e.g. do not cut afang stems, do not cut or climb bush mango) and should be formally incorporated into the FMC regulatory framework.

APPENDIX 1: BACKGROUND READING AND CITED LITERATURE

Alexander, D., & O. Effa. (s.d.) Non-timber forest products and their place in the State: from biodiversity to top twenty. Workshop Report 1. CRSFP, Calabar.

Alexander, D., & O. Effa. 1994. The non-timber forest products report: the preliminary NTFP survey of Cross River State. CRSFP, Calabar.

Cross River State Community Forest Project. 2001. Six month report (August 2000-January 2001). Calabar.

Cross River State Forestry Commission. Annual reports 1995-1999. Calabar.

Cross River State of Nigeria Gazette. 1999 Forest Law. Calabar.

Department for International Development. 1998. Corss River State Community Forest Project – Project Document. West & North Africa Department. London.

Eniang, E. & C. Akpan. 2001. Report on a 12-day field survey of grey parrots in Ekong-Anaku, Ikpan Forest Block, Nigeria. PPG Internal Report.

Eniang, E. & C. Akpan. 2001. PPG Progress Report (February-April 2001). PPG Internal Report.

Falconer, J. 1992. Report on a consultancy visit to advise the non-timber forest product programme in the Cross River State Forestry Project. CRSFP, Calabar.

Fripp, E. 2001. A socio-economic survey of the Abu Bashu communities, Cross River State, Nigeria. CRSCFP/ERM.

Günding, L. 2000. Cross River State Community Forest Project: Legal Consultancy Report Part II: Forestry legislation for Cross River State – a review and concept for new legislation. ERM/CRSCFP.

Harris, D. J. 1996. A revision of the Irvingiaceae in Africa. *Bulletin du Jardin Botanique National de Belgique* 65(1-2): 143-196

Isawumi, M.A. 1978. Nigerian chewing sticks. Nigerian Field 43(2): 50-58

Ladipo, D. 1999. The development of quality control standards for ogbono kernels: efforts towards encouraging organised and further international trade in a NWFP of West and Central Africa. In: T.C.H. Sunderland, L.E. Clark & P. Vantomme (eds). *The non-wood forest products of Central Africa: current research issues and prospects for conservation and development*. Food and Agriculture Organisation. Rome. pp 245-250

Morakinyo, A.B. 1995. The commercial rattan trade in Nigeria. *Forests, Trees and People Newsletter*. No. 25.

Morakinyo, T., & S. Ekpe. 2000. Feasibility of establishing community-run sawmill enterprises in Abontakon (Biakwan) and Danare Ogar Ndey villages, Cross River State. Living Earth Foundation Nigeria.

Ngatoum, D. & A. Bokwe. 1994. Effectuee autour du Mont Cameroin: relatif au recensement de certaines especes des produits forestiere en voie de disparition. MINEF, Yaounde.

Olsen, K., H. Ekwoge, R.M. Ongie, J. Acworth, E.M. O'kah & C. Tako. [in prep.] A community wildlife management model from Mount Cameroon.

Omuluabi, A.C. & S.O. Abang. 1994. Marketing margins in non-timber forest products trade in Cross River State Nigeria. CRSFP, Calabar.

Otu, D., R. Dunn & J. Wong. 1994. A reconnaissance inventory of high forest and swamp forest areas in Cross River State, Nigeria. Cross River State Forestry Project. Calabar.

Sunderland, T.C.H. & P. Tchouto. 1999. A participatory survey and inventory of timber and non-timber forest products of the Mokoko River Forest Reserve, SW Province, Cameroon. A report for IR1/CARPE. Washington DC.

Tabuna, H. 1999. The markets for Central African non-wood forest products in Europe. In: T.C.H. Sunderland, L.E. Clark & P. Vantomme (eds). *The non-wood forest products of Central Africa: current research issues and prospects for conservation and development*. Food and Agriculture Organisation. Rome. pp 251-264

Ukpe, I. 2001. Progress report on household and rattan artisan surveys, Cross River State, Nigeria. African Rattan Research Programme.