SOCIO-ECONOMIC CASE STUDY OF THE PRODUCTION-TO-CONSUMPTION SYSTEM OF THE RATTAN SECTOR IN CAMEROON

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EXECUTIVE SUMMARY

To reflect the importance of rattan as a Non-Timber Forest Product (NTFP), this study was commissioned to the Limbe Botanic Garden (LBG) by the International Network for Bamboo and Rattan (INBAR). The major objective was a) to study the Production-to-Consumption System (PCS) of the rattan sector in Cameroon, b) to identify problems faced by various actors and c) to identify development interventions for the improvement of livelihoods in the study area and for a sustainable rattan industry in Cameroon.

The PCS of the rattan sector in Cameroon involves a number of participants including harvesters, transporters, manufacturers, traders and the consumers of the final products. The harvesters carry out first stage processing after harvesting by scraping, sizing and bundling the cane before transporting them either to the villages or towns. The manufacturers do the final processing to come up with the finished products that are either sold directly to the consumers or via other traders.

During the study, it was noted that thousands of Cameroonians depend on rattan for their livelihood, particularly the rural poor and unprivileged urban dwellers that do not actually have better jobs to do. 90% of the 195 main actors interviewed depend solely on rattan processing. These participants transform a total of 98,690 stems of rattan per month, having a value of 9,869,000FCFA monthly, the average price per stem being 100FCFA.

Concerning the institutional policy and legal framework, there is presently no law guiding the exploitation of rattan from the forest. It is recently that the Government of Cameroon created a sub directorate of NTFPs with one of its objectives being the development of important laws on key species. Already, laws guiding the exploitation of *Prunus africana* had been put in place. Similar laws concerning other plant species including rattan are still in the making.

Another area of interest during this study was to identify problems faced by the various participants in the sector. The major bottlenecks identified in the sector include:

- Unsustainable harvesting of the wild rattan
- Unavailability of rattan in urban areas during the rainy season as a result of inaccessibility
- Lack of proper storage facilities
- Lack of appropriate working tools

- Lack of good quality products
- Lack of market for the cane products
- Lack of encouragement on the part of the government
- Lack of cultivation knowledge.

As a result of these problems, some recommendations have been proposed including:

- Improvement of the harvesting techniques and the management of the resource
- Introduction of on-farm cultivation of rattan
- Improvement of transformation techniques
- Organisation of trade links
- Carrying out more research on the ecology and taxonomy of the different species of African rattans.

An intervention logical framework that is a tabular analysis of constraints, indicators and interventions has been included in this report (Appendix A).

Note: This report has been edited slightly from the format in which it was presented to INBAR.

LIST OF ACRONYMS

ARRP	African Rattan Research Programme
AVACA	Association des Vanniers de Carrefour Agip
CABCIG	Cane and Bamboo Workers Common Initiative Group
CARPE	Central African Regional Programme for the Environment
CDC	Cameroon Development Corporation
CERUT	Centre for the Environment and Rural Transformation
CTC	Conservation Through Cultivation
CWU	Cane Workers Union
INBAR	International Network for Bamboo and Rattan
IUCN	International Conservation Union
KNP	Korup National Park
LBG	Limbe Botanic Garden
LUC	Limbe Urban Council
MCP	Mount Cameroon Project
MINAGRI	Ministry of Agriculture
MINEF	Ministry of Environment and Forestry
NGO	Non-Governmental Organisation
NTFP	Non-Timber Forest Products
RAVAN	Regroupement de Artisan Vanniers
RBG	Royal Botanic Gardens
UK	United Kingdom

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INTRODUCTION

Cameroon in West Africa is located between 2 and13^0 North and 8 and 16^0 East. It has 4, 591 km of land boundaries and 402 km of coastline. It is bordered by the Central African Republic (797 km) in the east, by Chad (1, 094 km) in the Northeast, by Nigeria (1, 690 km) in the west and northwest and by the Republic of the Congo (523 km), Equatorial Guinea (189 km) and Gabon (298 km) in the south. It covers a total area of 475, 440 sq. km. of which only 6, 000 sq. km is water.

TOPOGRAPHY AND CLIMATE

Cameroon' s terrain is diverse, with plains in the north and the southwest, the Adamawa plateau in the centre and high mountains in the west. The highest point is Fako (4, 095 m) in the west and the lowest is sea level. Lake Chad is in the far north and straddles the border with Chad. Three major rivers flow into the Atlantic: The Wouri, the Nyong and the Sanaga, which is formed from the confluence of the Lom (which flows from the northwest) and the Noun (which flows from the east). The Dja arises in the east and flows out of the country into Congo in the east. The river Bénoué flows north to Nigeria through Lagdo reservoir. Cameroon has a tropical climate along the coast and semi-arid and hot in the north. Rainfall along the coast is about four metres per year. In the north the dry season runs from October to April.

1.1 Forestry Sector Review

Cameroon is the most biologically rich country on the continent, apart from the Cape region of South Africa (IUCN, 1986; Sunderland *et al*, 1997; cited by Etuge *et al*, 1998). The country encompasses an intricate mosaic of diverse habitats with moist tropical forest predominating in the south, south west and east, montane forest, alpine, savanna and near desert in the far north (Letouzey, 1985). Thirteen percent of the land is used for arable crops, two percent for permanent crops and four percent for pasture.

The forest constitutes one of the country' s major resources, covering more than 40% of the national territory and is characterised by a wide variety of fauna and flora. Therefore it was deemed necessary to integrate innovative strategies for the national utilisation of rural land, reflect the new national economic context and recognise the world-wide concern for the

sustainable management of the environment. The Government of Cameroon adopted a new forestry law in 1994, highlighting its strategies for making the forestry sector contribute to the socio-economic development of Cameroon by involving local communities, NGOs, economic operators, as well as international communities. More attention has now been directed towards Non-Timber Forest Products (NTFPs).

1.2 NTFP Subsector Review

Although NTFPs are often classified as secondary to forest products, they have tremendous contributions to make to the rural and national economic development. It is not unusual to find that some locally available NTFPs are at least equal to timber products in importance (Said, 1963, Poulson, 1982). The actual market benefits of timber are often small, relative to these non-timber resources to the rural inhabitants (Peters, Gentry and Mendelsohn, 1989).

Most Cameroonians, particularly the rural inhabitants depend on NTFPs for their subsistence and advancement. These products are gaining increased attention as a supplement to small farmer livelihoods, a possible alternative or complementary use to timber extraction. NTFPs are mostly used as food, medicine, and raw material in the handicraft industry as well as for beautification.

Some of the species including *Irvingia* spp., *Dacryodes edulis*, *Prunus africana*, *Gnetum africanum*, *Garcinia mannii*, *Cola acuminata*, rattans, etc are increasingly threatened as habitat loss, destructive harvesting practices and over-harvesting contribute to reduce wild populations below recoverable levels. To date, these species have not been satisfactorily domesticated, and are therefore vulnerable to the stresses placed on the wild populations.

In some cases, policy makers may not fully appreciate the sector' s potential to contribute to the regional or national economy. This is not surprising, as few demonstrable models yet exist and data supporting or refuting the sector' s role is scant. Therefore, the recent creation of a sub Directorate in charge of NTFPs is well timed as it seeks to study the current state of the sector and put in place guiding principles governing the exploitation and management of some key NTFPs including rattans.

1.3 Rattan Sector Review

Rattans are a group of spiny, climbing palms highly valued in the furniture and handicraft industry. There are over 600 species of rattan in S.E Asia, representing 13 genera. In Africa, there are 20 species representing 4 genera, three of these: *Laccosperma, Eremospatha* and *Oncocalamus,* which are endemic to Africa. *Calamus*, with many species in S.E Asia is represented by only one variable species in Africa. Almost all of the species found in Africa are also represented in Cameroon (Table 2).

Table 2. Rattan Species found in Cameroon

1) *Laccosperma secundiflorum*	11) *Eremospatha cuspidata*
2) *Laccosperma opacum*	12) *Eremospatha borendii*
3) *Laccosperma acutiflorum*	13) *Eremospatha quinquescostolata*
4) *Laccosperma laeve*	14) *Eremospatha haullerilleana*
5) *Laccosperma robustum*	15) *Eremospatha tessmanniana*
6) *Eremospatha macrocarpa*	16) *Oncocalamus mannii*
7) *Eremospatha wendlandiana*	17) *Oncocalamus tuleyi*
8) *Eremospatha hookeri*	18) *Oncocalamus macrospathus*
9) *Eremospatha laurentii*	19) *Oncocalamus wrightianus*
10) *Eremospatha cabrae*	20) *Calamus deeratus*

There are about 20 species of rattan in Africa and there is a lot of confusion about these species. This is as a result of the fact that very few researchers in Africa have done any work on this important resource, whereas in S.E. Asia, a lot of researchers are carrying out work on rattan and generating a lot of information. However, in an attempt to address this problem, Terry Sunderland, coordinator of ARRP, based at the University of London, is carrying out work to revise the taxonomy of rattan species in collaboration with Dr. John Dransfield (palm specialist) from RBG Herbarium, Kew, UK.

In Cameroon, as in other parts of Africa, factors such as forest degradation, increasing demand for attractive cane products, and the fact that rattan is not grown commercially, have prompted the Limbe Botanic Garden (LBG), through its programme of Conservation Through Cultivation (CTC) to carry out seed germination and on-farm trials. One hectare of rattan (*Laccosperma acutiflorum*) plantation trial was established with the collaboration of ARRP, CDC and CARPE. A rattan arboretum was also established in LBG for future taxonomic studies. Herbarium specimens were also collected to determine the richness and species diversity in the Mount Cameroon Project (MCP) region in particularly, and Cameroon as a whole.

Use of Rattans

Rattans are one of the most important NTFPs of the forested region of Cameroon and Central Africa. They play an integral part in indigenous subsistence strategies. They have a proven history of use at both the urban and village level in the production of numerous objects like furniture, fish traps, cross bows, baskets, storage vessels, and other important products. It also has the potential for the generation of income as a high quality export product, either as raw cane or furniture in the export market. However, trade and marketing of these products has been at a subsistence level, or via internal channels within Cameroon. Though often solidly constructed, the products, particularly furniture, are often not of a quality that could be marketed in world trade. Given the healthy demand for cane products around the world, this represents a lost economic opportunity for the craftsmen and marketers of cane products within Cameroon.

Rattan Markets

Most of the raw cane production in the world is confined to Indonesia where they grow rattan in plantations. This is however a missed opportunity for Cameroon in particular and Africa in general, where rattan is rather harvested opportunistically from wild populations. Currently, the global rattan trade is generating 6.5 billion US dollars per year. Unfortunately, most of this trade is from Indonesia and Asia with Africa missing out on a potentially very lucrative business.

2.0. RATIONALE OF THE STUDY

Apart from the collection of herbarium specimens, spot surveys and inventories, African rattans have not been widely studied from a socio-economic perspective. Though this is changing, data is scarce on the chains and consumption/utilisation aspects. The results of this project will help draw a picture of the sector in Cameroon. This in turn, will help the Cameroon government and Limbe Botanic Garden (LBG), an institution hosting research, to make rational and informed decisions about the management of the resource and development of the industry.

Data on the entire chain of production and attendant transformative and utilisation processes will enable LBG and INBAR to suggest interventions into the process to increase efficiency and scale and depth of benefits. These include the identification of bottlenecks in the supply of raw materials and finished products, improved product quality, the profitability and sustainability of the rattan industry.

METHODS

The Production to Consumption system (PCS)

Rattans are one of the most important Non-Tree Forest Products (NTFPs). They are renewable, yield annually and are readily accessible to rural peoples. As a resource they have enormous potential to fuel rural development and this has long been recognized in many parts of the world. However any rattan development program exists within the context of the society in which it is implemented and is subject to pressures and limitations (constraints) from many factors within that society not apparently directly related to growing, processing and selling rattan. In order to develop a successful development program an understanding of all these factors (their effects, their magnitude and their potential (beneficial or detrimental)) is required. This necessitates investigations far more detailed than can be conducted at country or regional level.

Carefully focussed case studies do allow such detailed analyses to be made and can be very useful if they are chosen to be truly representative. Such case studies are often based in specific geographical locations, primarily due to the nature of the rattan resource. However because of the large variety of raw material-management systems and processing techniques to which rattans are subjected, and end products into which they are made, it is necessary to use a reliable and standardized tool for analyzing all the processes involved, and all the factors impacting upon them. Thus the International Network for Bamboo and Rattan adopted the

concept of the Production-to-Consumption System (PCS) (Belcher, 1995). This involves the entire chain of activities to which the rattan is subjected, from the production of raw material (including the input market, where one exists) through the various stages of intermediate sales and processing, to the consumer of the final product. The system includes the technologies used to process the material as well as the social, political and economic environments in which these processes operate. These are all covered in the case study.

Subsequently analysis of the PCS enables identification of all the constraints limiting rattan management and use, and highlights opportunities that, if taken, would promote rattan-based development. Development programs can then be planned which utilize and develop the opportunities whilst circumventing, or even eliminating, the constraints. In ideal environments these programs may be limited to the rattan PCS itself. In less favorable environments they may include policy shifts, infrastructural changes and even legal changes (for example relating to land tenure). In all cases the emphasis is on community-led development (by the community, for the community) with the maximum possible benefit remaining within the community. The Production to Consumption System analytical framework utilized for this study is based on that explained in INBAR working paper Number 4.

The aim of this study is to develop interventions to benefit local rattan workers, from the harvesters to the consumers, through processors, manufacturers, distributors of products and other components of the rattan sector. Significant benefits should also accrue in terms of the overall conservation of resource and its exploitation on a sustainable basis. In the short run, the beneficiaries of this project are the Non-Governmental Organisations (NGOs), government and research institutions that will make use of the data to help identify pertinent interventions to the sector. These interventions in turn will directly, through improved efficiency, improved profits, improved technologies of marketing techniques or harvesting practices benefit those working in the rattan industry.

3.0. OVERALL DEVELOPMENT OBJECTIVES

The general objective of this study was to study the production-to-consumption system (PCS) of the rattan sector in Cameroon and to identify development interventions for the improvement of livelihoods in the study area and for a sustainable rattan industry in Cameroon.

3.1. Specific Objectives

The case study attempted to achieve the following specific objectives:

1.Provide detailed background information on the rattan sector, and in particular the socio-demographic profile of the host communities in Cameroon.

2. Develop a comprehensive understanding of the production-to-consumption system of rattan.

3. Identify technical, institutional policy and legal issues.

4. Identify potential development interventions that will serve to transcend bottlenecks, problems, and inefficiencies in the rattan sector and improve the livelihood of the rural stakeholders in Cameroon.

5. Produce fully costed activity models for selected potential interventions.

4.0. STUDY AREA SELECTION AND DESCRIPTION

Main Cluster Towns

+1---Limbe
+2---Buea
+3---Douala
+4---Bamenda
+5---Yaounde
+6---Kribi
+7---Kumba
+8---Mundemba
+9---Mamfe

The study area covers five major provinces, namely Littoral, Centre, South, North West and South West provinces. It ranges from the grasslands of the North West, through the mountain/ coastal regions in the South West, to the central capital city (Yaounde), including the major shipping/ tradeport (Douala) and a town (Kribi) that is a major staging area for the harvesting and transport of cane from the forest to processors and manufacturers. This is to gain a full picture of activities across the geographical and cultural range. The target areas, Bamenda, Douala, Kumba and Yaounde capture the major rattan trade centres in Cameroon (Figure 1).

Raw rattan collecting communities and rattan processing villages, rural and urban towns were selected based on the relative distribution patterns of target stakeholders (collectors, handicraft and furniture producers) in Cameroon. In this study, seven major clusters were considered (Table 1).

Table 1. Distribution of survey respondents by cluster

Cluster	Province	No. of respondents
Buea/Limbe	South West	17
Douala	Littoral	39
Bamenda	North West	27
Yaounde	Centre	51
Kribi	South	12
Mundemba/Kumba	South West	24
Mamfe	South West	25
TOTAL		**195**

In addition to the 195 respondents, 213 apprentices, 185 family members and 197 other workers hired by cane workshop proprietors are also involved in carrying out rattan activities.

5.0. METHODOLOGY

5.1. Literature Review

The literature review consisted of going through work previously carried out in Cameroon, primarily at the Limbe Botanic Garden library, University libraries and those of other Conservation Projects like CERUT and KNP. Other current literature was obtained via the Internet. Persistent gaps were filled by correspondences between LBG and its local collaborating institutions including MINEF, MINAGRI, LUC, as well as with other institutions abroad like INBAR and ARRP.

5.2. Field Study

Field trips varying between 1-7 days were made to each study region. The length of each trip depended on the intensity of rattan activities in the area as well as its distance from the base.

These were structured to visit major cane processing and marketing sites in large towns and also to schedule visits as supply chains and individuals are identified, to villages and rattan populations in the forests. The actual survey sites in the villages were therefore chosen, following initial interviews in urban areas. A purposive, rather than probability sampling was employed. Other methods used for gathering information included; observation, informal contacts, forest surveys, photography.

5.3. Data Collection

Data sheets or questionnaires were designed for the different participants in the sector including harvesters (or collectors), manufacturers (or processors) as well as traders of both the raw cane and finished products (Appendices B, C & D). These questionnaires which were designed to address the objectives of the study were filled on the spot during the interview by the research team members. Other details were taken down in notebooks.

5.4. Data Analysis and Reporting

Two major methods of analysis were employed in the study. These included:

- descriptive analysis
- statistical analysis

The first method describes the market chain from the forest to the users of the end products. The data collected gives a picture of the different pathways taken by the product.

Using the second method, frequency tabulations and charts were used to present the collected information on the various aspects of rattan handicraft operations where necessary. Measures such as mean, median, mode, standard deviation, coefficient of variation and percentages were employed to compare frequencies and to express qualitative variables in a numerical form where need be.

Reports were provided after each field trip and these contributed to the final report of the study. Conclusions arrived at, as well as recommendations drawn at the end of this study are from the perspective of the participants in the sector.

6.0. RESULTS/FINDINGS

6.1. The Production-to-Consumption System

The Production-to-Consumption System (PCS) is an entire chain of activities from the production of rattan material, including the various stages of intermediate sales and processing, to the consumer who utilises each of the several final products.

This system involves a number of participants including rural and urban harvesters, transporters, manufacturers, traders and the consumers of the final products (Figure 2).

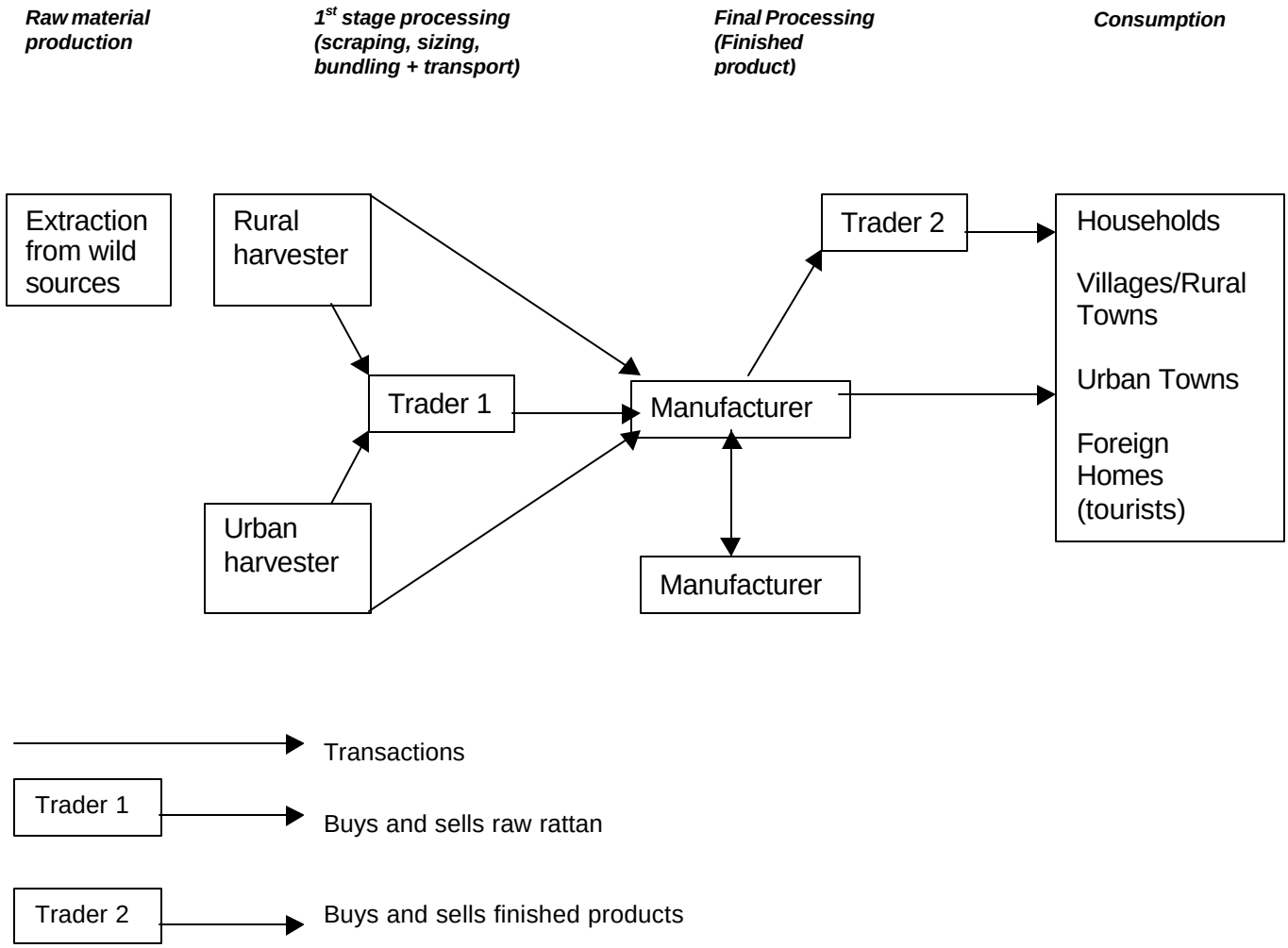

Figure 2. Rattan Production-to-Consumption Flow in Cameroon

The harvesters extract the raw rattan from wild sources, carry out first stage processing after harvesting by scraping, sizing and bundling the cane before transporting them either to the villages or towns. The raw cane can be transformed by the harvesters themselves or sold to traders who in turn supply the manufacturers. The manufacturers do the final processing to come up with the finished products that are either sold directly to the consumers or via other

traders. However, it is worth noting that some of the wholesale traders on raw rattan establish direct links with rural harvesters or send urban groups to collect in the forest (Figure 3).

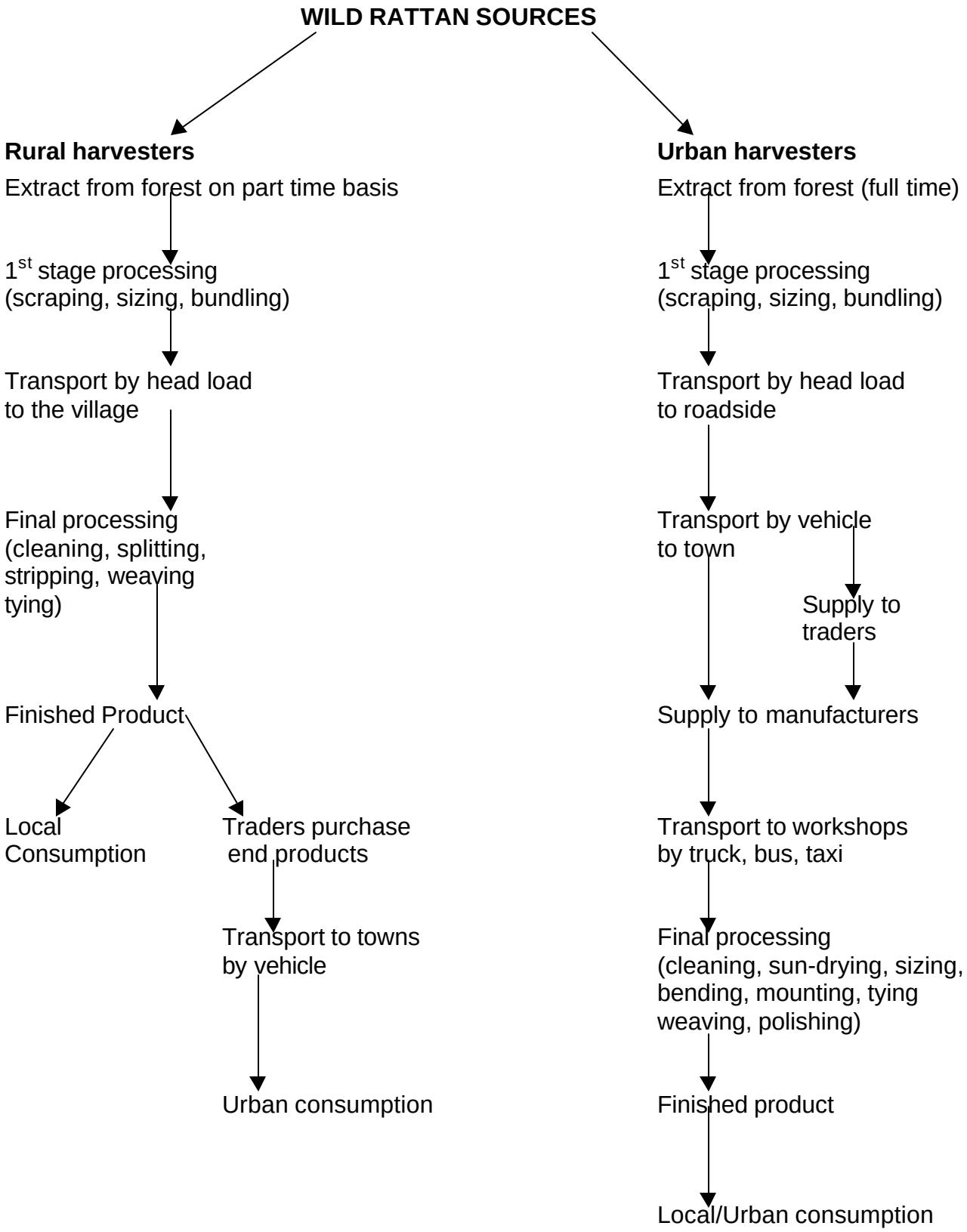

Figure 3. Role of the Various Participants in the Rattan Sector

6.2. Social/Educational Status of the Participants

Most of the collectors carry out rattan harvesting as a secondary activity with their primary activity being predominantly agriculture. A few others have other occupations as their main activity including carpentry, building, trading, driving and teaching (Table 3).

Table 3. Major Occupation of Rattan Collectors

Major Occupation	% Collectors
Farming	51
Rattan Collection	36
Others	13

More than 75% of the participants interviewed have attained either primary or secondary education (Table 4). This gives an indication that they can easily adapt to changes or take to new innovations.

Table 4. Educational Status of Rattan Collectors

Educational Status	% Collectors	% Processors
Nil	7	4
Primary	48	46
Secondary	30	29
Post Secondary	7	13
Training College	6	4
University Graduate	2	4

Most of the participants involved in the rattan sector are married (Table 5). In this light, they are more stable and likely to stay in the sector. This also reflects the importance of the activity to their livelihood.

Table 5. Marital Status of Rattan Collectors and Processors

Marital Status	% Collectors	% Processors
Married	77	71
Single	21	29
Widow/Widower	2	0

6.3. Rattan Collection Sites

The rattan obtained from the wild generally occurs in swampy areas, virgin and secondary forests. Specifically, the large cane is abundantly found in virgin and secondary forests, whereas the small cane occurs most in swamps and riversides. In a greater part of the areas studied, the large cane is more abundant in the forest than the small cane. Greater proportions of the collectors harvest from the thick forests. Therefore, the more the forest is chopped down, the more the rattan resource is lost (Table 6).

Table 6. Rattan Collection Sites

Site	% Collectors
Thick (virgin) forest	64
Swamps/Riversides	29
Secondary forest	7

6.4. Rattan Collection Periods

Although rattan is harvested all year round, most of the collectors prefer carrying out this activity during the dry season due to easy assess into the forest as well as less intense agricultural activities. During the rainy season, heavy rains and floods prevent them from gaining access into the forest (Table 7).

Table 7. Rattan Collection Periods

Collection Period	Months	% Collectors
Dry season	October-March	68
All year round	January-December	26
Rainy Season	April-September	6

6.5. Rattan Species Collected

Nearly all species of rattan are used for some purpose somewhere. However, basically two types are more often harvested from the forest. These are the large diameter cane (*Laccosperma secundiflorum*) and the small diameter cane (*Eremospatha macrocarpa*) commercially known as *marka* (or *maraka*) and *filet* (or *rotin*) respectively (Table 8).

Table 8. Rattan Species Collected and Uses

Species	Local Name	Main Uses	% Collectors
Laccosperma secundiflorum and *Eremospatha macrocarpa*	Marka (maraka) and filet (rotin)	Framing, staking, mounting, weaving	89
Eremospatha macrocarpa	Filet (rotin)	Weaving, framing	9
Laccosperma secundiflorum	Marka (maraka)	Framing, mounting, staking	2

However, there is a lot of confusion in identifying the various species of African rattans. In the course of this research work, the different participants in the sector considered all types of small cane, for instance, as one species, although they are actually of different species. It is therefore absolutely necessary to carry out a study on the ecology and taxonomy of the different species of cane due to lots of similarities amongst the species, both at the juvenile and mature stages. This could be one of the approaches in achieving the conservation prospects of these species in Cameroon and the world at large.

6.6. Harvesting System

Harvesting of rattan is often an unpleasant and dangerous activity because of the spines and dead branches often being dislodged, as well as ants, wasps and snakes being disturbed. This activity is mostly done by men and is generally considered as a job for the under privileged i.e. those who do not actually have better jobs to do. For this reason, there is indiscriminate harvesting of both the mature and immature cane stems. More so, part of the stem is left entangled in the forest canopy. Therefore it is necessary to improve on the harvesting technique and the management of the resource through the introduction of proper harvesting techniques. This could be done through meetings including chiefs and elders, taking advantage of the fact that the people have respect for their traditional rulers. For example, harvesters could be encouraged to remove all of the viable stems from a clump, instead of just the lower part of the stem or cut the stems and let them get dry before harvesting. This would improve productivity as well as ensure adequate light penetration for the clump to regenerate satisfactorily.

The method of harvesting involves, in the first place, the identification of mature cane stems. These are recognised not only by the size of the stem or the dry leaves, but also by the fact that they no longer have spines at the base. The stem is cut at ground level and pulled, while cleaning off the spiny epidermis, until when it hooks, it is cut again. The remaining spines are then cleaned off. A cutlass is used for this purpose and is considered as the principal tool for

harvesting. Considering the risky nature of the task of harvesting, the harvesters are usually well protected with long-sleeved shirts, boots, socks, caps and gloves. Most of the harvesters, particularly those in the villages could not even afford these protective devices and are thus much more exposed.

The rural harvesters cut from the rattan plants closer to the village and then proceed further into the forest. After 5-6 years, they come back to the plants that were first exploited and start harvesting again after regeneration. They mostly carry out their activity on individual basis. On the other hand, urban harvesters move in a group into a village. After harvesting from the forest around that village, they leave and go to another village and so on. They come back later to the forest that was first exploited after the plants must have regenerated.

After harvesting, the big cane is tied in bundles of 15-30stems while the small cane is tied in rolls of varying sizes, depending on the number of stems per roll. Exceptionally, in Kumba, the big cane is tied in bundles of 50 stems each and the small cane in bundles of 70-80 stems each. The length of big cane ranges from 3-5m, while that of small cane can go up to 12m and above. However, considering the fact that rattans are always very heavy, some of the harvesters tie the cane in smaller bundles that they can be able to transport by head. Some other important factors affect the quantity of rattan harvested (Table 9).

Table 9. Factors Affecting Quantity of Rattan Harvested

Factor	% Collectors
Season/time of the year	41
Resource availability	25
Accessibility	23
Demand for raw material	11

6.7. Transport System

The rural harvesters transport their harvested rattan by head load from the forest to the village. The urban gatherers on the other hand transport by head load from the forest to the roadside, where a vehicle then carries them to the suppliers in town. In most cases, the rattan is transported from the market (supply points) to the processing centres (workshops) by the use of push trucks and at times by taxis in the case of small cane (Figure 4).

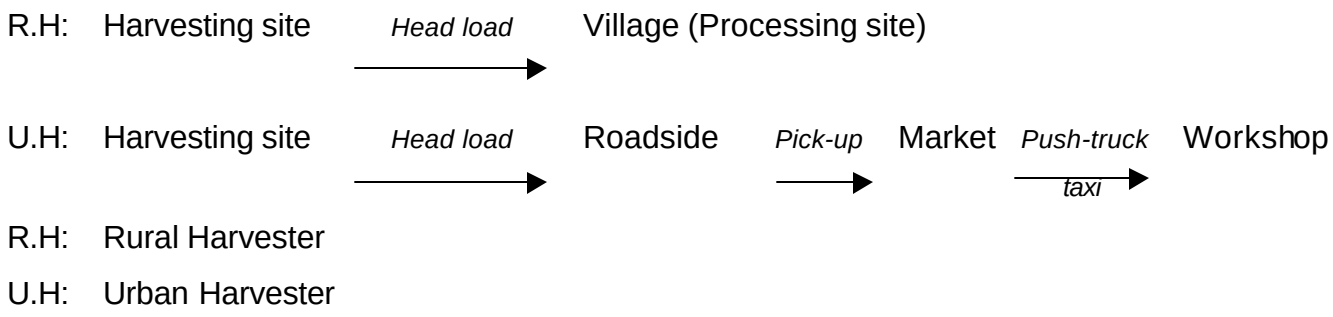

Figure 4. Transport of raw rattan from harvesting to processing site

Often, the urban groups harvest and park the rattan in the forest. After harvesting is completed, one or two days are set aside for transportation to the roadside. Transportation of the rattan from the forest to town is a major problem as the harvesters at times spend a number of days on the road, principally as a result of bad roads, particularly in the rainy season. As a result of difficulty in transporting the rattan and increased transportation cost, there is scarcity of rattan in towns during this period, thus leading to increased prices of the raw material. Increase in transportation costs also results from the fact that they give tips to foresters, gendarme and police officers who harass them on the way. There is therefore high need for the transport link between the rural villages and urban towns to be improved as well as putting in place a policy for the exploitation of the resource.

6.8. Processing / Manufacturing system

While cane processing is considered a ' small industry,' it is evident that thousands of Cameroonians rely on it for their livelihood. During this study, it was noted that 90% of the processors interviewed depend solely on rattan processing. A few have farming as their primary occupation while others are technicians, teachers, drivers, traders and preachers (Table 10).

Table 10. Major Occupation of Rattan Processors.

Major Occupation	% Processors
Rattan Processing	90
Farming	4
Others	6

In addition, these enterprises are significant cane ' consumers' , transforming 3,827 bundles of cane per month worth more than 9 million FCFA (Table 11).

Table 11. Quantity of raw cane used/month by manufacturers in each cluster

Cluster	No. of manufacturers	Amount of cane used/month (in bundles)	Value in FCFA
Buea/Limbe	17	162 (4,860 stems)	486,000
Douala	39	954 (28,620 stems)	2,862,000
Bamenda	27	216 (6,480 stems)	648,000
Yaounde	51	1,956 (39,120 stems)	3,912,000
Kribi	12	107 (3,210 stems)	321,000
Mundemba/Kumba	24	172 (8,600 stems)	860,000
Mamfe	25	260 (7,800 stems)	780,000
TOTAL	**195**	**3,827 (98,690 stems)**	**9,869,000**

At the workshops, which are usually located along roadsides in urban areas, and at home in rural settings the outer layer of the raw cane is removed using a small knife. The old sheaths are systematically scraped away to leave the clean, workable cane beneath. The stems are then left to dry for an average of 2 days (dry season) or 3 days (rainy season). This process is undertaken for both the big and small cane.

For the big cane, once it is dry, it has unfortunately lost some of its flexibility and in order to facilitate manipulation of the cane into the desired framework, it is bent using heat supplied from a blowtorch (blue lamp). It is then cut into the required dimensions, depending on the product to be made. These are used wholly as the framework. The small cane is split, the inner core cleaned and used for weaving and/or tying. Sometimes the full small cane can be used to form the skeleton of a product, together with the big cane, depending on the size and strength requirement of the product. The problem with the use of the blowtorch is that it leaves dark scorch marks on the cane, which are not always very presentable.

Manufacturers in urban areas produce a wide variety of cane products including chairs, tables, cupboards, beds, baby cots, wardrobes, trolleys, divans, house decorations, etc. Those in rural areas are mostly involved in the weaving of cane baskets, sieves, fishing baskets, trays and other locally used products. The few of them who produce chairs, tables, etc rarely do proper finishing. For example, the cleaned cane is not smooth and the end products are scarcely varnished except on command. The prices of the products depend largely on the design and size (Table 12).

Table 12. Price Ranges of Major Cane Products

Product	Price Range (FCFA)
Rattles	200-2.000
Wig stand	200-3.500
Shopping basket	200-8.000
Serving tray	250-5.000
Calabash/drum frame	300-1000
Flower vase or jar	300-15.000
Fishing basket	350-1000
Walking sticks	500-800
Sieve	500-1.500
Lamp shelter	500-20.000
Cap	1000-5.000
Simple chair	1000-7.000
Table	1000-50.000
Product	**Price Range (FCFA)**
Picture frame	1.500-3.000
Magazine stand	1.500-5.000
Book shelf	1.500-7.000
Side stool	1.500-8.000
Cupboard	1.500-120.000
Baby' s cot	2.000-40.000
Box basket	2.500-10.000
Cage	3.000-12.000
Carpet	5.000-7.000
Wardrobe	5.000-120.000
Studio chair	7.000-35.000
Bed	7.000-150.000
Trolley	8.000-30.000
Bar counter	8.000-100.000
Mannequin	10.000-20.000
Rocking or Resting chair	10.000-60.000
Living room furniture	12.000-750.000
Parlour divider	15.000-32.000
TV stand	20.000-40.000
Dining set	20.000-200.000
House decorations	40.000-150.000

The major problem in this domain is the use of inappropriate working tools. Most of the workers complain that they do not have enough capital to purchase better or modern tools, which are often not available. They use worn out tools, which obviously slow down the rate of production as well as reduce the quality of the finished products. The possibility of acquiring modern tools will consequently lead to increase in productivity as well as improve on the quality of the product (Table 13).

Table 13. Tools & Equipment Used in Processing

Tools/Equipment	Uses
Blow torch (or Blue lamp)	Bending, straightening and heating big cane; also for decoration
knife	Scrapping, cleaning, splitting cane
Hammer	Nailing
Pinchers/pliers	Removing nails
Secateur	Cutting/cross-cutting small cane
Hack saw	Cutting/cross-cutting big cane
Hand saw	Cutting plywood
Scissors	Cutting clothes and foam
Tape	Taking measurements
Brush	Polishing or applying varnish or paint
Screw driver (or borer or chisel)	Boring holes on plywood
Sand paper	Smoothening edges of plywood and cane
File	Sharpening knife
Clamp	Holding cane in place
Lighter	Lighting up blue lamp or blow torch
Pen or pencil	Marking
Sewing machine *	Sewing clothes for cushions

* Used only in well established workshops

Apart from cane, other materials are used to improve on the design of the products. These include plywood, raphia, wood, paint, varnish, dyes, foam, clothes, etc (Table 14).

Table 14. Chemicals/Additional Materials Used in Rattan Processing

Chemicals/Additional Materials	Uses
Gum/Glue	Binding joints, fasten tying
Varnish	Polishing finished products
Paint	Decorating/beautifying finished products
Dye	Decorating/beautifying finished products
Colour	Decorating/beautifying finished products
Spirit (Alcohol)	Diluting varnish
Xylamon (Insecticide)	Prevention of insect attack
Chemicals/Additional Materials	**Uses**
Kerosene or Petrol	Mixed with insecticide
Nails	Binding joints, attaching other materials
Plywood	Used together with cane in some cases
Foam	Used together with cane in some cases
Clothes	Used together with cane in some cases
Wood	Used together with cane in some cases
Indian Bamboo	Used together with cane in some cases
Raphia	Used together with cane in some cases
Dyed and Dried Grass	Filled in flower vases

Most of these additional materials are difficult to afford in today' s economic hardship by most of the workers. As a consequence, though the products made are often solidly constructed, they are not of a quality that could be marketed in world trade as compared to those produced in S.E. Asia, for example. However, for the major towns visited, cane products made in Douala and Yaounde are of a higher quality than those made in Limbe, Buea, Mutengene, Bamenda, Kumba, Mamfe, and Mundemba.

Although many more people are getting involved in the processing of rattan, their technology is not as advanced as those of their counterparts in S.E. Asia and therefore needs to be modernised. This could be achieved if training workshops and exchange visits are organised and the use of catalogues encouraged, whereby those with a great deal of expertise can share their experience with the local workers back here, who are less experienced.

Proprietors who work in collaboration with apprentices and/or other workers manage the cane workshops in urban areas. Most of the apprentices spend between 1-2 years in the workshop to

acquire these skills. While some of them pay a token to acquire these skills, others do so for free, especially if they are related to the proprietor. The other workers are hired by the proprietor, particularly those with big workshops, and paid either on a daily or monthly basis, or according to the amount of work done.

6.9. Storage System

The cleaned cane and processed products are always kept in a dry place, either in the workshop or in parking stores (magazines) which are usually rented close to the workshop. A particular chemical called Xylamon is generally used on the cleaned cane and cane products to prevent weevils from damaging them. Also frequent drying and varnishing of the finished products prevent rust and fungal attack.

Most of the workers face the problem of lack of storage facilities for raw, unfinished and finished cane products. Some of the manufacturers in Douala, Yaounde and Bamenda have no parking space or store. More so, in Bamenda, some manufacturers were met who do not have workshops at all. They patch up in garages or behind people' s houses, which are not well protected. As a result of this, rain, insects (weevils) and rats damage the cleaned cane and finished products, since they can equally not afford for the preventive chemical (Xylamon). In some urban towns for example Yaounde and Douala, there are a few warehouses (magazines) located around cane processing sites, which are rented out to the manufacturers. However, these are usually overcrowded and some of the finished products are damaged.

6.10. Marketing and Enterprises

Some wholesale traders of raw cane do not purchase cane at market sites, nor do some of them rely on harvesters to bring cane to urban centres. Rather they establish direct links with rural harvesters, or send urban groups to collect in the forest. In the urban towns, one or two wholesale traders in raw cane supply the manufacturers in the town with the raw material on cash basis.

When rattan is available, mostly during the dry season, the manufacturers buy on the spot from the suppliers. During the rainy season, when access to the raw material is difficult, as a result of floods and bad roads, they pay some money in advance to the suppliers who then give a command to the harvesters to go into the forest and harvest the cane. The rest of the money is paid on collection of the cane.

In the villages, most of the cane products are made for local use. However, in some of the villages, cane products are sold in local markets to other villagers as well as to outsiders. The majority of the weavers produce solely on command. In this case, the price of an article is pre-determined, and does not depend on market forces (demand and supply), as in the ordinary practice.

In the urban towns and some rural areas, cane products are sold mostly in the workshops, which are more often located along roadsides, where the products are displayed. Some of the products are made on command while others are meant for public sales. In most cases, portable cane products like baskets, flower jars, wig stands, and fishing baskets are sold by moving about with them on the streets and markets (by hawking).

Handicraft centres play an important role in the promotion of craftwork in general, especially in the North West province of Cameroon. As far as cane work is concerned, these centres advertise cane products and provide a ready market for the local manufacturers who supply the centres. By so doing, they provide jobs for school-leavers, encourage the idea of self-reliance and preserve indigenous arts and crafts of the region.

Some of the cane workers organise themselves into unions aimed at sharing ideas, skills and providing assistance for its members when necessary. Through these unions, prices of raw cane and cane products are harmonised. These unions include AVACA, CABCIG, RAVAN and CWU found in Douala, Bamenda, Yaounde and Kumba respectively.

CABCIG in Bamenda for example operates a handicraft shop where all its registered members keep their products for sale. As such, the manufacturers produce a wide range of products and strive to come out with good quality products. When the articles are sold, a small percentage is kept in the unions' coffers, which is used to motivate the salesmen and workers in the shop. Therefore the creation of collective selling points through community councils would help attract buyers as well as harmonise prices of products.

As regards exports, there are indications that in the 1920s, enormous quantities of raw rattan used to be exported from Douala and Kribi to France (Table 15).

Table 15. Raw rattan cane exports from Douala and Kribi to France. 1926-1928 (Hedin, 1929).

Year	Tonnes exported	Value in FF
1926	100	250,000
1927	58	137,000
1928 (Douala)	32	80,000
1928 (Kribi)	34	85,000

Source: ARRP First Annual Progress Report: November 1997

Presently, there are no traces of any legal export of either raw cane or cane products abroad. However, there are indications that very small quantities of raw cane cross to Nigeria by head load through the Korup support zone. It was also reported that Nigerians leave their side and cross to Ekok and Otu border villages on the Cameroon side to harvest rattan.

Harvesters and hired workers appear to be the most disadvantaged groups in the rattan sector in terms of income, whereas they are the highest in terms of number of people involved in rattan activities (Figure 5).

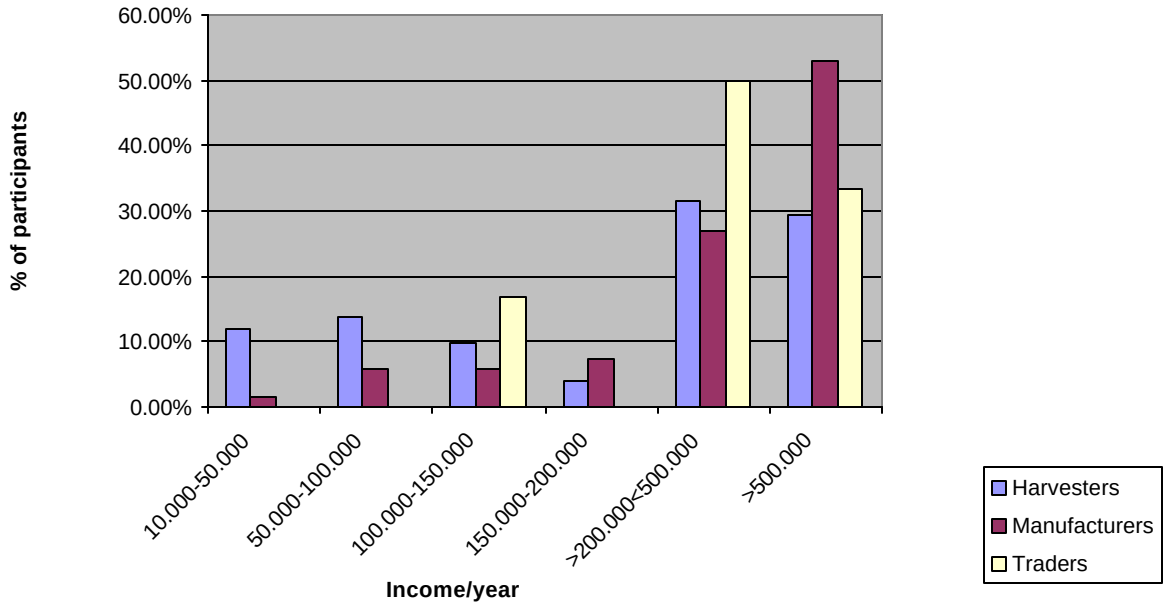

Figure 5. Annual income earnings of participants in the rattan sector

6.11. Policy, Administration and Legal Framework

Presently, neither formal nor informal governing structures exist that guide the exploitation of rattan from the forest at ecologically sound levels. For this reason, considerable doubt exists among researchers and conservation development projects as to the sustainable commercial harvest of wild rattan populations. Recently the government has created a sub directorate of NTFPs with one of the objectives being the development of important laws on key species. Before, some laws had been put in place guiding the exploitation of *Prunus africana*, one important plant species exploited by a pharmacological company, PLANTECAM based at Mutengene. Since 1972, the bark of this plant has been used by this local company as the major source of an extract used to treat prostrate problems. Similar laws concerning the exploitation of the other plant species including rattans are still in the pipeline.

However for urban groups to harvest rattan from the forest, permission must be obtained from the chief of the village. In most cases, wine, beer and some money is given to the chief and elders of the village on arrival. The amount of money given depends on how long the harvesters stay to exploit from the forest and how developed the village is. In other cases, the urban harvesting groups give the chief money each time a vehicle come from town to carry the harvested rattan. That is, whenever harvested rattan is leaving the village for the urban centres. The villagers themselves harvest rattan only from their own section of the forest. Trespass into the section that does not belong to them is prohibited, except by authorisation.

It is therefore evident that since rattan is not grown commercially and considering the increased demand for cane and cane products, the resource has already started facing problems of depletion around the urban areas. It is for this reason that the Limbe Botanic Garden (LBG), through its programme of Conservation Through Cultivation (CTC) has been carrying out seed germination trials. One hectare of rattan (*Laccosperma acutiflorum*) plantation trial was established with the collaboration of ARRP, CDC and CARPE in a redundant rubber plantation at Mabeta, near Limbe. A rattan arboretum was also established in LBG for future taxonomic studies. Herbarium specimens were also collected to determine the richness and species diversity in MCP region in particular and Cameroon as a whole. It is obvious that introducing the idea of cultivating rattan in plantations will be appreciated by farmers as most of the participants interviewed expressed their willingness to plant rattan if given the necessary support (Table 16).

Table 16. Respondents view on the cultivation of Rattans

Issue	% Respondents
Would like to cultivate	69
Not necessary	19
Can encourage others to cultivate	12

Apart from work that has been carried out at LBG, other researchers too have been working on this plant species. Amongst others, Terry Sunderland, coordinator of ARRP has been revising the taxonomy of rattan species in collaboration with Dr. John Dransfield from RBG Herbarium, Kew, UK. Dr. Patrick Shiembo carried out studies on the *Economic Analysis of Raphia and Cane Products in Cameroon* (1982) and the *Development and Utilisation of Minor Forest Products with particular Reference to Raphia and Rattan Palms* (1984) as projects for his B.Sc. and M.Sc. degrees respectively in the University of Ibadan, Nigeria. APFT has also studied the chains of production and the marketing of rattan.

7.0. CONSTRAINTS within the PCS and the national context

7.1. Unsustainable harvesting of wild rattan

There is indiscriminate harvesting of both the mature and immature cane stems. Part of the stem is often left entangled in the forest canopy. This leads to inadequate penetration of light to revive the new shoots, thus reducing the rate of regeneration. More often, stumps of young rattan stems are destroyed in the process as a result of carelessness on the part of the harvesters. This unselective harvesting practice is more common amongst the urban harvesters who usually migrate from village to village in search of the resource. This is the reason why these harvesters were sent away from some villages around Edea, indicative of the concern the villagers have for their resources.

The lack of management of the rattan resource by the government is due to the fact that it is considered as a ‘ free resource’ and cannot be considered to belong to any one person. Because rattan is considered a free resource and is widespread in the forest, no attempts have been made by the local population to conserve either of the two commercial species.

7.2. Shortage of Wild Sources

Habitat destruction as a result of over exploitation of timber and opening up of forest for agricultural purposes, shifting cultivation, etc. have led to a decrease in availability of this resource especially in forests close to urban towns. The harvesters need to go further into the forest to harvest rattan. During the rainy season, as a result of increase in distance and difficulty in transporting the rattan due to floods and bad roads, there is general scarcity of raw rattan in the market.

7.3. Lack of Storage Facilities

There is lack of storage facilities for raw, unfinished and finished cane products. Some of the manufacturers in Douala, Yaounde and Bamenda have no parking space or store. More so, in Bamenda, some manufacturers were met who do not have workshops at all. They patch up in garages or behind people’ s houses, which are not well protected. As a result of this, rain, fungi, insects (weevils) and rats damage the cleaned cane and finished products, since they can equally not afford for the preventive chemical (Xylamon).

7.4. Lack of Cultivation Knowledge

Most of the participants involved in this sector, particularly the harvesters do not believe that rattan can be planted. It was difficult to convince some them that this resource can actually be cultivated either by seeds or cuttings. This is obvious because no rattan plantation exists in the country presently. All of what is used is collected from the wild.

7.5. Lack of Appropriate Working Tools

Most of the workers complain that they do not have enough capital to purchase better or modern tools. They use worn out tools which obviously slow down the rate of production. For instance, the cleaned cane is not smooth and no proper finishing of the final product is done. Also, additional materials like plywood, clothes foam and varnish are too expensive. As a consequence, the end products are of low quality.

7.6. Lack of Market

There are not enough market outlets for the cane products within the country and no export at all. Most of the workers complain that there are times that they stay for more than a month or two without selling an article. They do not have steady or fixed markets. The products are sold only to the local people and this is done at individual selling points. Craftsmen have very low profit margins.

7.7. Lack of Good Quality Products

Finished products have a low quality and can not meet with international standards for export. The manufacturers do not have capital to purchase additional materials necessary to improve on the quality of their products. In addition to this, processing is entirely done manually and their skill or technology is not developed and no training facilities do not exists. For example, the use of the blowtorch, which leaves dark scorch marks on the cane in addition to the use of nails, makes the products not to be very presentable.

7.8. Lack of Incentive Measures

The Ministry of Environment and Forests, in charge of forest products does not undertake any activities to encourage the rattan sector. At the contrary, forestry officials extort money from

harvesters, transporters, traders and manufacturers by demanding a document for rattan harvesting that does not exist at all.

The above problems were deduced following the responses of the participants interviewed (Table 17).

Table 17. Problems/Constraints in Rattan Processing and Trade

Problems/Constraints	No. of Respondents
Poor/irregular product demand/prices	106
Inadequate storage facilities/insect attack	103
Scarce/expensive raw material	58
Transportation difficulties	40
Harassment by Foresters/Police/Gendarmes	33
Improper shelter/working space/display rooms	32
Insufficient capital	28
Accidents/injuries	23
Inadequate working tools	14
Inadequate technology	12
Language barrier	5

8. Opportunities within the PCS and in the national context

To encourage sustainable cultivation of rattan, the forestry department can take advantage of the agricultural extension agents in the area. Harvesters could also be encourage to harvest more rattan during the dry season and store to minimise the issue of scarcity during the rainy season.

There is some experience with rattan plantation, which should be expanded. The CTC unit of LBG has set up a one-hectare trial plot of *Laccosperma acutiflorum* in a redundant rubber plantation at Mabeta in collaboration with CDC and CARPE.

The construction of proper storage facilities with the availability of land and manpower will help resolve this problem and minimise the use of preservatives, which are usually not affordable. In

some urban towns for example Yaounde and Douala, there are a warehouses located around cane processing sites, which are rented out to the manufacturers.

Most of people involved in the rattan sector expressed their willingness to plant if that can be done. With the use of extension agents in the field coupled with the fact that most of them have attained some basic education, the introduction of the issue of cultivation would not be a problem.

The activities of NGOs in the area can be used to set up small business credits for the rattan sector. A common pool for expensive equipment could be established through these organised associations to be shared by many rattan operators.

The creation of export links would also be beneficiary, taking advantage of the existing policies for the export of other products including cocoa, coffee, timber, *Gnetum*, etc.

The Forestry department has issued a flexible permit system or rules governing the exploitation for other NTFPs e.g. *Prunus africanum.* This system should be copied for rattan in order to make a start with an official management of the resource base and control and monitor the trade of raw rattan.

9. CONCLUSIONS

Rattans, in particular the two species, *Laccosperma secundiflorum* and *Eremospatha macrocarpa*, are one of the most important NTFPs in Cameroon, at both the village level and in urban centres. Craftsmen process the raw canes into handicrafts and furniture. At the village level, rattan harvesting and processing is a secondary activity with the primary activity being predominantly agriculture. In urban town on the contrary, the rattan workers mostly carry out this activity as their sole occupation.

Harvesters and hired workers appear to be the most disadvantaged groups in the rattan sector in terms of income, whereas they are the highest in terms of number of people involved in rattan activities. Increase in demand of rattan products in the past has led to many more people being involved in the activity from illiterates to degree holders.

There is no proper management of the rattan resource base and the ongoing harvesting is leading towards the depletion, especially in the forest areas near urban centres. The forestry regulation considers rattan as a ‘ free resource’ without proper rules for collection. Consequently, harvesters have to go deeper in the forest to find rattan and transport costs increase. The expansion of timber exploitation and the slash and burn activities for agriculture compounds this problem.

10. RECOMMENDATIONS AND INTERVENTIONS

10.1. Improvement on harvesting techniques and management of the resource

INBAR should encourage harvesters to improve on the harvesting technique and the management of the resource. For example, harvesters could be encouraged to remove all of the viable stems from a clump, instead of just the lower part of the stem or cut the stems and let them get dry before harvesting. This would improve productivity as well as ensure adequate light penetration for the clump to regenerate satisfactorily. This could be done through meetings including chiefs and elders, taking advantage of the fact that the people have respect for their traditional rulers.

If legislation were in place, allowing ownership of rattan along the same lines as for timber trees, attempts at encouraging *in situ* management might be more successful and selective harvesting will be implemented. Defined guiding principles will be laid down implying sustainability of the management of the resource.

10.2. On-farm cultivation (Domestication)

Despite the fact that there are high concentrations of rattan in the study region, there is evidence of some scarcity, particularly around the urban centres. Because of this scarcity and because exploitation is undoubtedly increasing, there is a case for some small-scale on-farm cultivation in these sectors to alleviate the pressures on the wild resource. Workshop operators might benefit from being able to grow their own raw cane. As rattans need trees to grow on, secondary forest and farm fallow are ideal for the cultivation of rattan, and there is much of this land in the rural areas. The experimental plot at the CDC redundant rubber plantation at Mabeta is doing well and if cultivation is successful at this level, it would be appropriate to extend it to local farmers as has been undertaken successfully in S. E. Asia.

Taking advantage of the agricultural extension agents in the field, the willingness of rattan operators to go in for cultivation as well as the fact that most of them have attained some basic education, the introduction of the issue of cultivation would not be a problem. When this is done, the sources of raw rattan would be increased and availability at all times will be ensured.

10.3. Improvement on transformation techniques

Although many more people are getting involved in the processing of rattan, their technology still needs to be modernised. Processing is entirely done manually, the cane is usually not cleaned well, no proper finishing of the final products is done and the same designs of the products are made all the time. This could be achieved if training workshops and exchange visits are organised, whereby those with a great deal of expertise can share their experience with the local workers back here, who are less experienced. The fact that more than 98% of the participants have attained some level of education will facilitate such initiatives.

With the availability of modern technology in S.E Asia and support from INBAR and other NGOs, adaptable technology can be transferred to processors in this region. By so doing, the quality of intermediate as well as final products will be improved attracting both the internal and external market.

10.4. Establishment of trade links

Some of the finished rattan furniture produced in Douala and Yaounde, however, is of export quality but there is lack of both national and international market. Setting up collective selling points (or display rooms) though community councils would help attract buyers as well as harmonise prices at the national level. INBAR might be well placed to investigate the possibility of organising trade links for these products to be exported taking advantage of the existing policies for the export of other products including cocoa, coffee, timber, *Gnetum*, etc. In this case, marketing of the finished products will be improved.

10.5. Taxonomic study of African rattans

There is a lot of confusion in identifying the various species of African rattans. In the course of this research work, the different participants in the sector considered all types of small cane, for instance, as one species, although they are actually of different species. It is therefore absolutely necessary to carry out a study on the ecology and taxonomy of the different species of cane due to lots of similarities amongst the species, both at the juvenile and mature stages. This could be one of the approaches in achieving the conservation prospects of these species in Cameroon and the world at large.

10.6. Location of INBAR Regional Office in Cameroon

Considering the bilingual nature of Cameroon and work previously carried out on rattans with the collaboration with ARRP, location of the regional office here would facilitate the co-ordination of INBAR activities within the region. Being nearer the people, this will also ease the issue of solving some of the pertinent bottlenecks and improve the livelihood of the local communities in Cameroon in particular and Africa in general.

The above recommendations were also drawn from the perspective of the respondents (Table 18).

Table 18. Enhancing the Rattan Industry: Suggestions from Respondents

Recommendation	Description	No. of Respondents
Improve/Promote Marketing	• Promote export of both raw and processed rattan • Create direct links between the producers and foreign markets • Promote sale of products locally - Exhibitions, adverts, etc • Standardise prices of products • Well-organised and centralised marketing systems • Link producers to handicraft centres and co-operative societies	110
Create Permanent place for Workshop/Proper Shelter	• Organised and centralised processing workshops/factory sites/depot • Provision of warehouses • Central area or depot for marketing raw/processed rattan	85
Improve Mechanical Processing	• Introduce modern technology by providing machines for cleaning, shaping, etc • Introduce appropriate working tools • Improve on product design/styles (use of catalogues)	72
Cease Harassment and Put in Place a Permit System	• Forestry, Police and Gendarme Officers to cease extortion of money • Forestry Department to put in place a flexible permit system for the various participants in the sector	63
Provide Financial Assistance	• Loans/grant facilities to be provided by the government, NGOs, etc	43

Provide Technical Assistance	• Technology transfer through training workshops and seminars
	  - modern production techniques
	  - product design and styles
	• Organise exchange visits
	• Incorporate technology into school curriculum
		34

Improve Harvesting	• Train collectors on sustainable methods of harvesting • Cease indiscriminate timber exploitation/shifting cultivation	23
Improve Transport Facilities	• Improve on road network linking urban towns to rural areas • Open up roads linking the villages to collection sites • Reduce/harmonise cost of hiring vehicles	22
Improve Rattan Resource Base	• Opening up of Rattan Plantations • Management of natural resource • Monitoring of natural harvesting • Set up seed banks, germination trails	12
Create Rattan Workers Syndicate	• Co-ordinate activities • Manage/monitor resource • Control, regulate, stabilise prices • Lobby for assistance (financial, technical, etc) • Create contacts/export links	12

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APPENDIX A

INTERVENTION LOGICAL FRAMEWORK

Intervention Logical Framework(Findings-Causes-constraints-Opportunities-Interventions-Outputs)-CAMEROON

PCS-stages	Data / findings / indicators	Causes	Constraints	Opportunity	Interventions	Outputs
Harvesting	Abandon part of matured rattan stems at the forest canopy	Rattan leaves hook on canopy climbers and branches and requires time and energy/ Lack of harvesting policies	Unsustainable harvesting of wild rattan	People are understanding / People respect their traditional chiefs	Promotion of best practice (e.g. cut & let stems dry before harvesting) through meetings including chiefs	Cut matured stems entirely harvested
	Stumps of young rattan stems in the forest	Carelessness on the part of harvesters	Unsustainable harvesting of wild rattan	People are understanding / People respect their traditional chiefs	Promotion of best practice (e.g. Avoid cutting young rattan stems when cutting mature ones)	Less young rattan stems cut in the forest
	Harvesters sent away from some villages (e.g. Edea)	Unselective harvesting / No incentive to villagers	Unsustainable harvesting of wild rattan/ Non-cooperation of villagers	Villagers are concerned with their resources	Promotion of best practice (e.g. consultation with chiefs and villagers to agree on plan for sustainable harvesting)	Selective harvesting implemented/ Traditional rights respected
	Gradual increase of distance to raw rattan sources	Habitat destruction (e.g. Shifting cultivation, timber exploitation)	Shortage of wild sources	Existing agricultural extension agents in the field	Encourage sustainable agriculture / Encourage cultivation through extensionists	Sources of raw rattan increased
	Less harvesting in the rainy season	Rain; poor transport due to bad roads	Shortage of raw rattan in the rainy season	Time availability for cultivation during the rainy season	Encourage rattan planting / Store many raw rattan in the dry season	Availability of raw rattan in the rainy season ensured
Processing 1	Insects (weevils)/ rats/fungi damage raw rattan	Poor storage	Lack of storage facility / Lack of means for proper preservative	Availability of land and manpower	Construct proper facility for storage	Storage facility improved / Need for preservative reduced

PCS-stages	Data / findings / indicators	Causes	Constraints	Opportunity	Interventions	Outputs
Processing 2	Cleaned cane not smooth	Inability to afford new knifes	Lack of appropriate working tools	Availability of NGOs in the area	Introduce loan mechanism through organised groups / Encourage request of basic tools from NGOs	Quality of intermediate products improved
	The same designs of products made	Not exposed to other product designs	Lack of variety of product designs	Willingness of manufacturers to diversify their products / Existence of INBAR collaborators in S.E. Asia	Organise training workshops, exchange visits, uses of catalogues	Design of products diversified
	No proper finishing is done	Insufficient capital to purchase additional materials	Lack of good quality products	Availability of NGOs in the area	Provide financial assistance through loan or sponsor from NGOs	Quality of products improved
	Processing is entirely done manually	Inability to afford mechanical equipment	Lack of modern technology	Willingness for changes / Availability of technology in SE. Asia / NGO availability in the area.	Transfer adaptable technology with support of INBAR and other NGOs	Quality and quantity of products enhanced
	Mixed wood & rattan products	Lack of the rattan at the site	Short durability of some "rattan" products		Encourage cultivation / Inform the consumers on quality product	Knowledge of consumers on quality of rattan products improved
Marketing at rural level	Products sold only to the local people	Bad roads, no buyers from towns	Lack of marketing strategy		Improve trade links	Livelihood of rural processors sustained
	Individual selling points	No thought about their business future	Lack of marketing strategy	Existence of village community councils	Encourage collective selling points through community councils	Prices harmonised / Buyers attracted

PCS-stages	Data / findings / indicators	Causes	Constraints	Opportunity	Interventions	Outputs
Marketing at urban level	Products sold along roadsides by individual manufacturers	Lack of marketing principles / No thought about common display rooms	Lack of marketing strategy		Encourage collective selling points	Marketing of products improved / Prices harmonised / Buyers attracted
	Products sold only within country	No connections with the foreign market	Lack of international market	Availability of tourists / Existing export for other Products (e. g. cocoa, coffee, timber, *Gnetum*)	Create export links	Marketing of products improved
Policies	Additional expenses in the form of tips	Harrassment by foresters, police officers, etc.	Lack of regulatory framework (e.g. exploitation permit)	Existence of policies for other NTFPs (e.g. Prunus)	Put in place a flexible permit system	Resource management sustained
Financing	Capital from personal effort	No loan facilities available	Lack of storage facilities, tools, additional materials	Availability of NGOs in the area	Provide financial assistance through loan or sponsor from NGOs	Processing sector improved
Natural Resources accessibility	Harvesting done mostly during the dry season	Floods and bad roads during rainy season	Scarce and expensive raw material in the rainy season	Time availability for cultivation during the rainy season / Existence of road improvement agencies	Encourage the improvement of road network through appropriate institutions / Encourage rattan planting / Store many raw rattan in the dry season	Accessibility to rattan resource improved
Natural Resources quantity	No information on quantity per site	No inventory or survey conducted	Inadequate knowledge of available natural stock	Resource people available	Carry out basic survey of species distribution & density	Knowledge on the available stock improved

PCS-stages	Data / findings / indicators	Causes	Constraints	Opportunity	Interventions	Outputs
Natural Resources quantity	Protection of sources of raw rattan	Unselective harvesting/ No appropriate quota per site	Over harvesting of wild rattan at some sites around urban areas	Villagers are concerned with their resources	Promotion of best practice (e.g. consultation of the chiefs and villagers with plan for sustainable harvesting / introduce quota per site)	Selective harvesting implemented/ Traditional right respected
Natural Resources quality	Mixture of rattan species during harvesting and trade	Poor taxonomy of rattan species used / Bad intention of harvesters / Unavailability of required species	Poor quality raw rattan	Existence of a PhD student/Researcher on the taxonomy of rattan in the region	Update the knowledge of rattan operators using the reviewed rattan taxonomy/ Sensitisation / Cultivation	Quality of the raw rattan ensured
Human resources availability	Many operators exist in the rattan sector	Rattan is a source of income	Unstructured rattan communities	Existence of Government willingness to promote the NTFP sector including rattan sector	Encourage speed dialogue between Government, NGOs and rattan operators to re-organise the functioning of rattan sector	Rattan communities structured or organised
Human resources quantity	Sometimes orders are not met	shortage of people to assist / Lack of money to hire collaborators	Inability at times to satisfy customers	Existence of few established working groups	Encourage group work	Satisfaction of customers ensured
Human resources quality	Poor communication with the public interested in rattan	Use of interpreters	Lack of marketing strategy	existence of University graduates among rattan operators	Use educated rattan operators to train others	Interest to rattan product increased

PCS-stages	Data / findings / indicators	Causes	Constraints	Opportunity	Interventions	Outputs
Management	No proper regulatory framework / No proper management set up	No importance attached to rattan sector in the past / Harassment by foresters and police agents at road check points	Poor management of the rattan sector	Existence of improved management for other NTFPs set up (e.g. *Prunus*)	Develop mangement guidelines in collaboration with rattan operators	Management of rattan sector improved
Institutional factors	No proper regulatory framework / No protection of rattan operators	Lack of perception of the importance of rattan syndicates and rattan representative bodies	Lack of syndicates / rattan operators representative body	Existence of syndicates or associations for wildlife and timber in the country	Encourage creation of associations, educate them on their roles and link them with NGOs and the sub directorate in charge of NTFPs at the Ministry	Rattan promotional fora created and made operational
Equipment and tools	Under-equiped rattan operators	Lack of equipment purchasing capacity	Shortage of appropriate equipment	Notion of equipment sharing familiar to most operators	Encourage a creation of common pool for expensive equipment through NGOs or association sponsors to be shared by many rattan operators	Access to appropriate equipment improved
Finance	Inadequate costing	Lack of costing of all inputs	Poor marketing assessment	Availability of accounting services and experts in the area	Encourage dialogue between rattan operators and accounting bodies	Financial assessment of rattan sector improved

APPENDIX B

QUESTIONNAIRE-HARVESTERS

SOCIOECONOMIC CASE STUDY OF THE RATTAN SECTOR IN CAMEROON - LBG/INBAR

QUESTIONNAIRE: RATTAN HARVESTERS.

Interviewer:	
Checker:	

Area:_____ Location:_____Date of interview:_____

Name:_____ Residence(village, quarter etc):_____

Marital status:_____ Sex:_____ Age:_____ Education:_____

Household head?:_____ Ethnicity of respondent/spouse:_____ /_____

Main occupation/(spouse' s occupation):_____ /_____

Other activities:_____

Household size:_____ Permanent:____ Temporary:_____ Live in labourers:_____

Household composition: MC:_____ FC:_____ Adults:_____ Dependents:_____

No. involved in rattan harvest activities: M:_____ F:_____ C:_____

How long have you been involved in the harvesting of rattan?_____

How did you get involved in rattan harvest activities?_____

Where did you learn the skills from?_____

_____

Where did you get the capital required to carry out these activities?_____

How much did you start with?_____

What is the source of your raw rattan (wild harvest/bought/bartered, etc.)?_____

From which part of the forest do you harvest rattan (thick forest, secondary forest, swamp, riverside, plantation,etc)?_____

How often do you go to the forest to harvest rattan? _____

Who must you see to obtain permission to harvest/sell rattan got from the forest? _____

_____

Which types of cane do you have in your forest?_____

_____

Which type(s) do you collect often and why?

Type (species)	Reasons for collection/preference	Uses	Difference(s)

Method of harvesting _____

_____

Which tools do you use for harvesting rattan?

Tools used	Self produced	Bought (Cost)	Uses	Frequency of replacement

Do you hire labour at any stage of the activity?_____

If yes, at which stage?_____

What negotiations are made in this respect?_____

_____

Time taken to harvest a given quantity (Number or bundles):_____

What quantity can you harvest in a day/trip?_____

How many can you have in a bundle?_____

_____

Are the bundles standard (size, number, length of cane)? _____

_____

When do you normally harvest rattan here (peak/scarcity periods)?_____

_____

What changes have you observed on the availability and distribution of rattan since you got involved in this activity?_____

_____

Does the supply of raw rattan meet the demand for this resource?_____

If not, how do you cope with the situation?_____

_____

How is the size (number) of harvesters changing over time and why?_____

_____

What problems do you encounter during harvesting?_____

_____

_____

How have you tried to solve these problems?_____

_____

What is the role of women in the harvesting of rattan?_____

What problems do they encounter?_____

_____

How do you transport the rattan from source to parking lot/home (Means)?_____

_____

How far is the source from road/parking lot/home (hrs/km)?_____

What quantity is transported per trip? _____

What costs do you incur during transportation?_____

What problems do you encounter during transportation? _____

_____

How have you tried to solve these problems?_____

_____

At what stage do you sell the rattan (raw, semi-processed, processed)?_____

Processing before or after storage:_____

_____

_____

No.of people involved in processing/storage and their tasks:_____

_____

How do you store the raw rattan or processed products? _____

_____

What facilities do you have?_____

Which products do you make out of the harvested rattan? _____

What cost do you incur during processing and storage?_____

What problems do you encounter during processing and storage? _____

_____

How have you tried to solve these problems?_____

_____

Which of the products are home consumed by you?_____

_____

Which proportion of the products do you sell and what proportion do you keep for yourself?_____

_____

Where do you sell your harvested rattan or processed products (main markets)?_____

_____

How much can one sell the harvested rattan per local unit of measurement/each end product?_____

_____

Who sets the prices?_____

How do the prices fluctuate with changes in the availability of raw rattan (supply) and the demand for this resource?_____

_____

Frequency of sales per period stated (week, month, etc.):_____

What quantity can you sell at a given time?_____

Income per consignment sold at a given time:_____

When do you sell most/least and why?_____

Where do your customers come from?_____

Who are your main buyers?_____

What special arrangements are involved in the process of selling the raw rattan (on command, payment in advance, etc)?_____

_____

Are there any people in groups/unions/association in this community involved in:

a) harvesting?_____

b) processing?_____

c) marketing of rattan or rattan products?_____

(List groups if any)

Which of them do you belong to?_____

What types of negotiations/arrangements are done during transactions:

a) among themselves within the group_____

b) with others_____

c) with village authorities_____

d) with government_____

How do you interact with other harvesters/ transporters/ manufacturers/traders? _____

_____

Have you had any collaboration with any institution/NGO/group/individual, etc?_____

What did you learn from this collaboration?_____

_____

If you had the means and opportunity, what changes would you like to see:

a) developed_____

b) improved_____

c) abandoned_____

What would you do if you were asked to plant rattan?_____

What contribution can you make towards this and what assistance would you require?_____

_____

_____

Show the contribution of the different sources of your income in a given year.

Source of income	Contribution (% or cash)	Time spend on each (specify)

Annual income (FCFA, estimated): A:10.000 – 50.000 B: 50.000 – 100.000

C:100.000 – 150.000 D:150.000 – 200.000 E: >200.000 < 500.000 F: >500.000

APPENDIX C

QUESTIONNAIRE-MANUFACTURERS/TRADERS

SOCIOECONOMIC CASE STUDY OF THE RATTAN SECTOR IN CAMEROON - LBG/INBAR

QUESTIONNAIRE: RATTAN – MANUFACTURERS/TRADERS:

Interviewer:	
Checker:	

Area: _____ **Location:**_____ **Date of interview**_____

Name:_____ Residence(village, quarter etc):_____

Marital Status:_____ Sex:_____ Age: ____ Education:_____

Household head?:_____ Ethnicity of respondent/spouse:_____/_____

Main occupation /(Spouse' s occupation):_____/_____
Other activities _____

Household size:_____ Permanent:____ Temporary:_____ Live in labourers:_____

Household composition:MC:____FC:____Adults:____Dependents:_____

No. involved in rattan processing and trade M:_____ F:_____C:_____

Position in workshop (proprietor, apprentice etc):_____

Specific job performed:_____
How long have you been involved in the manufacture/trade of rattan/rattan products?_____

How did you get involved in this activity?_____
_____

Where did you learn the skills? _____

_____

How do you get capital required for your work?_____
How much did you start with?_____

What is the source of your raw rattan (wild harvest/bought/bartered)? _____
If bought from whom and where?_____

At what stage do you buy the rattan (raw, seasoned, semi-processed)?_____

_____

How often do you buy rattan? _____

How much can one buy harvested rattan per local unit of measurement?._____

What quantity do you buy at any given time and at what price?_____

_____

Number of stems in a bundle?_____
_____

Are they standard bundles (size, number, length of cane)?_____

_____

Which types of cane do you buy often and why?

Types of cane	Reasons for preference	Uses	Differences

When do you normally have the raw cane (peak/scarcity periods)?_____

_____

What changes have you observed in the availability of raw rattan since you got involved in the activity?_____

_____

What special arrangements are involved in the process of buying the raw material (on command, payment in advance, etc.)_____

_____

How is the size (number) of manufacturers/traders changing over time and why?_____

_____

*How do you transport the raw rattan to the workshop (Means/cost)?*_____

_____

How far is your workshop from the source of your raw material (hrs/km)?_____

What problems do you encounter in the course of buying and transporting the raw rattan?_____

_____

How have you tried to solve them?_____

_____

How do you process the raw rattan in your workshop_____

Which additional materials do you use for processing the end products?

Material	cost	Frequency of replacement

Which tools do you use for processing?

Tools used	***Self produced***	***Bought (Cost)***	***Uses***	Frequency of replacement

No. of people involved in processing activities and their tasks: _____

_____

_____

Do you hire labour at any stage of the activities?_____

If yes, at what stage?_____ _____

What negotiations are made in this respect?_____

_____

No. of apprentices and their job types:_____

_____

How much do they pay to acquire the skills. (monthly /yearly) ?_____

Duration of course: _____

What factors affect the production rate and design of products?_____

_____

_____

Which end products are derived from processing and what is the cost of each?

End product	Price range

How do you store the raw rattan and processed products?_____

_____

_____

What facilities do you have?_____

_____

What problems do you encounter?_____

How have you tried to solve them?_____

_____

Which of the end products are home consumed by you?_____

What quantity do you sell and what quantity do you keep for yourself?_____

_____

_____

Where do you sell your processed products (main markets):_____

_____

How do you actually sell them (in the workshop, by hawking, by the roadside, on command etc)?_____

_____

Who sets the prices?_____

How do the prices fluctuate with changes in the availability of rattan (supply) and demand for the end products?_____

Frequency of sales per period stated (week, month, year):_____

What quantity do you sell at a given time?_____

Income per consignment sold at a given time:_____

When do you sell most/least and why?_____

_____

Where do your customers come from?_____

Who are your main buyers?_____

Does the supply of your products meet the demand?_____

If not, how do you cope with the situation?_____

_____

How do you transport/distribute your end products (means/cost)?_____

_____

Are there any people in groups/unions/associations in this community involved in:

a) Manufacturing?_____

b) trade on rattan products? _____

(List groups if any)

Which of them do you belong to?_____

What types of negotiations/arrangements are done during transactions:

a) among themselves within the group_____

b) with others_____

c) with village authorities_____

d) with government_____

How do you interact with harvesters/transporters/traders/other manufacturers?_____

_____

Have you had any collaboration with any institution/group/NGO/individual etc:_____

What did you learn from this collaboration?_____

Who must you see to obtain permission to:

a) operate the craft centre_____

b) to sell your products_____

What opportunities exist in this business?_____

If given the opportunity which aspects would like to see:

a) developed:_____

c) improved:_____

d) abandoned:_____

What problems do you encounter in the trade on the end products:_____

_____

How have you tried to solve these problems?_____

_____

What is the role of women in processing and trade?_____

What problems do they encounter?_____

Would you like to plant rattan or encourage people to do so?_____

_____

What contribution can you make towards this and what assistance would you require:_____

_____

_____

Show the contribution of the different sources of your income in a given year.

Source of income	Contribution (% or cash)	Time spent on each (specify)

Annual income (FCFA, estimated): A:10.000 – 50.000 B: 50.000 – 100.000

C:100.000 – 150.000 D:150.000 – 200.000 E: >200.000 < 500.000 F: >500.000

APPENDIX D

QUESTIONNAIRE-TRADERS

SOCIOECONOMIC CASE STUDY OF THE RATTAN SECTOR IN CAMEROON - LBG/INBAR

QUESTIONNAIRE: RATTAN –TRADERS.

Interviewer:	
Checker:	

Area:_____ Location:_____Date of interview:_____

Name:_____ Residence(village, quarter etc):_____

Marital status:_____Sex:_____ Age:_____ Education:_____

Household head?_____ Ethnicity of respondent/spouse:_____ /_____

Main occupation/(spouse' s occupation):_____ /_____

Other activities:_____

Household size:_____Permanent:____Temporary:_____ Live in labourers:_____

Household composition: MC:_____FC:_____Adults:_____Dependents:_____

No. involved in trade rattan on products: M:_____F:_____C:_____

How long have you been involved in the trade on rattan products? _____

How did you get involved in the trade on rattan products?_____

How do you get capital required for this trade?_____

How much did you start with?_____

Do you hire labour at any stage of the activity?_____

If yes, at what stage?_____

What negotiations are made in this respect?_____

_____

Where do you buy your cane products and from whom?_____

How often do you buy the products?_____

Which cane products do you buy often and why?

Product	Reason for preference	Quantity bought	Buying price	Selling price

When do you normally have the cane products (peak/ scarcity periods)?_____

_____

What changes have you observed on the availability of cane products since you got involved in the activity?_____

_____

What special arrangements are involved in the process of buying the cane products (on command, payment in advance, etc)?_____

_____

How is the size (number) of traders changing over time and why?_____

_____

What problems do you encounter in the course of buying the cane products?_____

_____

How have you tried to solve them?_____

How do you store the cane products? _____

_____

What facilities do you have?_____

What problems do you encounter?_____

_____

How have you tried to solve them?_____ _____

_____

Which of the products are home consumed by you?_____ _____

_____

What quantity do you sell and what quantity do you keep for yourself?_____

_____

Where do you sell your cane products (main markets)?_____

_____

How do you actually sell them (in a store/shop, hawking, on the roadside, on command, etc)?_____

_____

Who sets the prices?_____

How do the prices fluctuate with changes in the availability of cane products (supply) and the demand for these products?_____

_____

How often do you sell (per week, month, etc)?_____

What quantity do you sell at a given time?_____

Income per consignment sold at a given time:_____

When do you sell most/least and why?_____

Where do your customers come from?_____

Who are your main buyers?_____

Does the supply of your products meet the demand?_____

If not, how do you cope with the situation?_____

How do you transport the cane products from the source to the sales point (Means/Cost)?_____

s_____

How far is the source of your cane products from the sales point (hrs/km)?._____

Are there any people in groups/unions/associations involved in the trade on rattan products in this community?

List_____

Which of them do you belong to?_____

What types of negotiations/arrangements are done during transactions:

a) among themselves within the group_____

b) with cane product suppliers_____

c) with village authorities_____

d) with government_____

How do you interact with manufacturers/ transporters/ other traders of cane products?_____

_____

Have you had any collaboration with any institution/NGO/group/individual, etc?_____

What did you learn from this collaboration?_____

_____

Who must you see to obtain permission to sell your cane products?_____

_____

If you had the means and opportunity, which aspects would you like to see:

a) developed_____

b) improved_____

c) abandoned_____

What problems do you encounter in the course of selling the cane products?_____

_____

How have you tried to solve these problems?_____

_____

What is the role of women in the trade on cane products?_____

_____

What problems do they encounter?_____

Although you are a trader, would you like to plant rattan or encourage people to do so?_____

_____

What contribution can you make towards this and what assistance would you require?_____

_____

_____

Show the contribution of the different sources of your income in a given year.

Source of income	Contribution(% or cash)	Time spent on each(specify)

Annual income (FCFA, estimated): A:10.000 – 50.000 B: 50.000 – 100.000

C:100.000 – 150.000 D:150.000 – 200.000 E: >200.000 < 500.000 F: >500.000