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The role of non-timber forest products to communities living in the Northern periphery of the Korup National Park

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Abstract

Non-timber forest products (NTFPs) extraction and trade is considered an income generating activity for subsistence livelihood in rural forest communities in Cameroon. This paper is to ascertain whether Non-timber forest products exploitation and commercialization is economically profitable to livelihood or just a customary activity promoted by economic hardship. Surveys involving 184 households, parcel inventories, interviews and reviews were used revealing that Non-timber forest products exploitation and farming occupy 90.8% and 80.4% respectively of the total work force. Agricultural contribute 66% against 31% for Non-timber forest products to the local economy. Policy changes like the institutionalization of community forest and decentralizations in 1997 and the transfer of authoritative regulation to peripheral actors in the mid-1990s permitted local benefit from Non-timber forest products resources.

Keywords: Non-timber forest products, Exploitation, Commercialization, Livelihood, Custom, Community.

Resumo

A extracção de produtos florestais não madeireiros é considerada uma atividade de geração de renda para os meios de subsistência em comunidades florestais rurais dos

Camarões. Este artigo propõe verificar se a exploração e comercialização dos PFNM é economicamente rentável para o sustento ou se consiste apenas numa atividade rotineira promovida por dificuldades económicas. Pesquisas e inquéritos envolvendo 184 famílias, inventários de parcela, entrevistas e comentários foram metodologias usadas, revelando que a exploração dos PFNM e a agricultura ocupam 90,8% e 80,4%, respectivamente, da força de trabalho total. A agricultura contribui com 66% na economia local contra 31% para os PFNM. As mudanças de políticas como a institucionalização e a descentralização da floresta da comunidade em 1997 e a transferência de regulamentação oficial para atores periféricos em 1990 consolidaram à escala local os benefícios oriundos de PFNM.

Palavras-chave: PFNMs, exploração, comercialização, meios de subsistência, tradição, comunidade.

1. Introduction

In the early 19th century, foresters talked about “minor” or “secondary” forest products referring to what are known today as non-timber forest products (Kennedy de Souza 2012 and FAO 1981). The adjective “non-timber” illustrates that Non-timber forest products could provide profitable alternatives to logging of (mostly) tropical forest (Wil de Jong 2012 and CIFOR Factsheet 2012) and supposedly provides alternative to forest conservation than agriculture. In the early 1990s, the tropical deforestation focus was replaced by forest-based poverty reduction through Non-timber forest products exploitation (Wells and Brandon 1992, Clay and Clement 1993). The Korup forest is one of Africa’s richest forest and its northern peripheral zone is host to a number of non-timber products (Nkwatoh 2010; and FAO 1988). This forest contains viable populations of naturally occurring forest species mostly referred to as “High Conservation Value” forest (HCV) with cultural, ecological, economic and religious value to the local communities (Ngalim 2012; Grenand 1992). These communities are not classified as indigenous but are an enclave depending highly on the forest (Hough 1998).

The study area covers seven communities and includes; Abat, Bakut, Mbgegati, Osselle, Bajoh Bayip-Ossing and Basu (fig 1).

Figure 1. Location of the study area

Source: WWF-Limber and modified by author.

The communities indicated on figure 1 have an estimated surface area of about 56.000 hectares of forest land comprising of primary, secondary and young forest (TRC 2010). The Korup National Park (KNP) support zone communities are located between the northern peripheries of KNP, south west of Nkwende hills and south of the Ejagham forest reserve. This zone is surrounded by three forest reserves constituting a large landscape forest massive. It is difficult to geographically separate the vital village space from the timber exploitation zones especially the Forest management Unit (FMU) 11001 which is surrounded by three forest reserves made up of Ejagham in the north, Nkwende hills in the south, Nta Ali in the east and the Korup National Park in the south east. There are two other communities not sampled living right inside the park called the “Ekengues” and “Ekogate”.

1.1. Problem and questions regarding non-timber forest products in the area

Despite the existence in abundance of many species of Non-timber forest products and timber resources in the Northern periphery of the Korup National Park, the inhabitants remain extremely poor with most communities living below the poverty line of US\$1.25 per day (UNICEF 2003). This salvaging condition brought to focus the following questions;

- What is the contribution of non-timber forest products to people livelihood in the Northern periphery of the Korup National Park?
- Is the exploitation and commercialization of Non-timber forest products an economy activity or just a customary activity?
- And could an associated activity like agriculture jointly bring economic sustainability?

Conceptual ideologies: NTFPs and livelihood.

The variety of different interests in the subject gives rise to different definitions of Non-timber forest products. For instance Arnold, J. and Ruiz, M. (1996) consider Non-timber forest products as “any non-timber product that is dependent on a forest environment”. The Centre for International Forest research (CIFOR) defined Non-timber forest products as “any product or service other than timber that is produced in forests”. De beer and Mcdermott (1989) consider Non-timber forest products to “encompass all biological materials other than timber, which are extracted from forests for human use”. There has been ambiguity between Non-timber and non-wood forest products. FAO (1999) holds that Non-wood forest products consist of goods of biological origin other than wood, derived from forests, other wooded land and trees outside forests. However Belcher (2003) admits that there is much confusion on the use of various terminologies on this issue and harmonising them by using non-timber which include fuel wood or charcoal.

Table 1. Overview of non-wood forest products

Product category	
A:Plant products	Examples
Food	Plant parts (seeds, roots, tubers, stems, leaves, shoots, flowers, fruits, nuts) Edible plants (vegetables, snacks, beverages, edible fats and oils, spices, flavorings, etc).
Forage	Plants used for food for livestock and wildlife
Medicinal plants	Medicinal herbs and plants and plant parts (leaves, barks, etc).
Construction materials	Bamboo, rattan, small wood, fibers, cork, leaves for roofing
Utensils	Smallwood for handicraft and tools, leaves for wrapping food, fibers for basketry and cloth
Bio chemicals	Non-edible fats and oils, waxes, gums, latex, dyes, tannins, biochemical for plastics and coatings, paint and varnish, toxins for hunting hallucinogens
Aromatics	Essential oils for cosmetics and perfumes, incense
Ornamentals	Aesthetically pleasing plants, cut and dried flowers
B:Animal products	
Food	Meat and protein from mammals, birds, fishes, reptiles and insects; eggs, edible nest, honey
Forage	Fish oil, bonés
Medicinal plants	Pharmaceuticals extracted from mammals, fishes and reptiles
Utensils	Horn, feathers, bonés
Bio chemicals	Wax, silk, propolis, guano, toxines
Ornamentals	Live animals and animal products like feathers, hives skins, shells and horns

Source: Adopted from FAO (1999).

1.2. The state of the arts of non-timber forest products in rural forest societies

Different authors have got their views on the significance of Non-timber forest products. Authors (E.g., Tchoungui et al., 1995., Oyono 2005., Arnold and Ruiz-Perez 1996) think it is a major income generating activity for subsistence livelihood but motivated by economic recession in many forest areas. Authors (e.g., Mambo 2000., Nkwatoh 2000., Arnold and Ruiz-Perez 1996., Malleson 2003) believe Non-timber forest products is very profitable in most parts of Africa as a major source of cash income and livelihoods. Some authors (e.g. IUCN et al.; 1992; Wells and Brandon 1992; Clay and Clement 1993; Westoby 1975 and FAO 1978) considered it a means of resource conservation and long-term development. Clark (2001) noted that Non-timber forest products provide a small but significant source of income, particularly for women and families that do not have access to agricultural markets.

Contrarily, Ngali (2011) working on the study area noted that Non-timber forest products contributed only 9.78% to household incomes and that the poor highly depend

on Non-timber forest products than the rich. Belcher & Schreckenberg (2007); Belcher (2003) Laird & Guillén, (2002) and Peters (1996) hold that Non-timber forest products are unreliable for economic growth while Marshall et al., (2006); Belcher et al., (2005) hold that increased demand result to intensive harvesting leading to over-exploitation. They also consider the sale of Non-timber forest products a basic means of income for the poorest section of communities, rather than a potential socioeconomic stimulant. Ruiz-Pérez et al., (2004a); Ros-Tonen and Wiersum, (2005); Marshall et al., (2006) hold that Non-timber forest products trade is not necessarily a pro-poor activity but a components in people's livelihood strategies according to their economic conditions not a source of overall household economy. Others (e.g., Ndoye et al., 1998., Oyono, Kouna, & Mala 2005., Essama-Nssah and Gockowsky 2000) believe that uncontrolled exploitation and insufficient species regeneration are driving some species to extinction.

Main hypothesis of the study

This study was based on the hypothesis that even though non-timber forest products cannot bring about socio-economic development to the area, it remains a substantial contributor to the livelihood of people living in the northern periphery of the Park.

1.3. Livelihood and sustainable livelihood

Figure 2. Interrelationship between non-timber forest products and livelihood

A livelihood comprises the capabilities, assets including both material and social resources and activities required for a means of living (Afungang, 2012). Livelihood is sustainable when it can cope with and recover from stress and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base (Chambers & Conway, 1991). This is evident of the interaction of the different primary activities (agriculture, fishing, poaching) taking place in the area.

1.4. Non-timber products and agricultural activity chain

Figure 3. Exploitation and commercialization chain. Interaction of activities in the area.

Source: Afungang, R.N (2012)

As could be seen on figure 3, agriculture, Non-timber forest products exploitation, fishing and hunting and their trade are inter-connected in a circuit-like manner geared towards the satisfaction of basic food and economic needs. Food crops are produced to meet food needs and excesses sold while a large amount of Non-timber forest products are produced for the market with less internal or local consumption. Bush meat and fish are primary sources of protein but equally serve as a source of fast money for many households. Income generated through these activities is used to acquire imported goods that come into the area through traders and middle men trading in Non-timber forest products and agricultural products and for the use of secondary sector services.

2. Methodology

A documentary review was made on different Non-timber forest products in the area leading to the development of a questionnaire that systematically addressed pending questions. Door to door Interviews, focus group work, forest parcel inventories and measurements, group cartography, photography and simulations were also used to gather information. Validation of these techniques was through qualitative analysis of the results with regards to reviews. Micro soft word, Excel, Access, SPSS and ArcGIS was used for data treatment and result presentation. Information reflected general ideas of respondents and sampling was done in accordance with percentages proposed by Ongolo (1998).

Communities	Total population	Average n° of households	Average persons/ household	Total household sampled	Sampling percentage
Abat	640	128	5	56	44%
Bakut	518	103	5	29	28%
Mbgegati	410	82	5	30	37%
Osselle	326	81	4	22	27%
Bayip-Ossing	140	46	3	15	33%
Bajoh	198	49	4	25	51%
Basu	20	6	3	7	100%
Total	2252	495	29	184	37%

Table 2: Sampling guide and percentages

Source: Afungang, R.N (2012).

3. Results

Constituting a natural right and habit for the people of the upper Obang “Ngunjie” tribe of Oyomujock sub-division, the exploitation of non-timber products is hereditary and passed from generation to generation fundamentally oriented to meet basic needs.

In recent times, Non-timber forest products have emerged as non-conventional export commodities from Cameroon, Nigeria and Central African emanating from the South West region of Cameroon including about 25-50% of overall village incomes from the study area. Examples of such products include *Gnetum spp.*, *Irvingia spp.*, *Ricinodendron heudelotii* and *Dacryodes edulis* (African pear) (Ngalim, 2001). In the Korup region, the most utilized Non-timber forest products are green leaved vegetables such as *Gnetum*

spp., *Heinsia crinita* (atama), condiments such as country onions *Afrostryax lepidophyllus* and *Irvingia spp.* and soup thickeners such as *Ricinodendron heudelotii*.

A large proportion of local construction materials like thatch and rattan for house and bridge construction, decorations, craft, designed and packaging materials come from the forest. Fruit harvesting, hunting and fishing activities are daily hobbies for a greater majority of the population. Different rate of species extraction is not only influenced by nutrition habits, customs and tradition but also by geographical location of communities. For instance *Irvingia gobonnensis*, *Irvingia wombulu*, *Ricinodendron heudelotii*, *Piper guineensis*, *Gnetum africanum*, *Garcinia lucida* and *Garcinia kola* are exploited in all communities while *Scorodophloeus zinkeri*, *Coula edulis*, *Pentaclethra macrophylla*, *Masularia accuminata* and *Alanblankia floribunda* are very much exploited only in enclave communities.

Even though there is a total over mixture of different customs and habits, three main activities were identified across the zone. Main activities here include; farming, exploitation of Non-timber forest products, fishing and hunting. Amongst these, farming is the most important and involves the entire population. Just like agriculture, the extraction of Non-timber forest products involves everybody with women and children most involved. Secondary and tertiary activities occupy about 5% of the total work force. The hunting population might be faulty since most people adhere or identify themselves with fishing than with hunting due to criticisms and fear of sanction from the state.

Activity Villages	Total pop	Sampled household	Farming	NTFP extraction	Hunting	Fishing	Other activities
Abat	640	56	39	30	11	7	16
Bakut	518	29	35	34	14	5	5
Mbgegati	410	30	29	30	8	3	14
Osselle	326	22	27	26	18	8	12
Bayip- Ossing	140	15	12	12	7	2	0
Bajoh	198	25	27	28	5	3	3
Basu	20	7	7	7	3	2	0
Total	2252	184	148	167	66	30	50
%			80.4%	90.8%	35.9%	16.3%	27.2%

Table 3: Repartition of activities in the Korup zone

Source: Afungang, R.N (2012)

Just as in many forest zone in Cameroon, Non-timber forest products exploitation and farming occupy 90.8% and 80.4% respectively of the work force. About 37.7% of Abat's population is engaged in farming followed by Bakut with 37%, Bayip-Ossing 36.4% and Osselle is the least with 34.5%. The percentage of inhabitants engaged in Non-timber forest products exploitation is not quite different from that engaged in farming. While Abat has 29.13% of its population engaged in Non-timber forest products extraction, Bakut has 36.6% while Bajoh is the highest with 42.4%. An estimated occupy 10.8% of the population is engaged in the secondary and tertiary sectors with Mbegati community having 16.7%, Osselle 13.2%, Abat 15.5% and Bakut 5.4%. Remote areas like Basu and Bayib-Ossing have 0% secondary activity taking place there.

3.1. Non-timber forest products exploitation

Abat, Mbegati and Bakut stand out in ascending order of importance as the highest exploiters of Non-timber forest products in the area. They have a total number of 29, 27 and 25 products respectively which were extracted in the area over the last three years (2009-2012). Osselle and Basu follow with 24 and 23 products respectively also followed by Bayip-Ossing and Bajoh communities with a total of 21 products. Among the over 30 products extracted on regular or yearly basis, *Irvingia gabonensis* and *Irvingia wombulu* (sweet and bitter bush mango) are the most exploited. This product has a frequency of 144 in the 189 household's sampled across the zone. In all the communities, it represents about 30% of all NON-TIMBER FOREST PRODUCTS exploited. *Gnetum africanum*, *Ricinodendron heudeloti*, *Elaeis guineensis* (palm kernel oil), "manyanga". Apart from casho which is a vegetable mostly consumed locally, the other four products constitute over 80% of non-timber products sold. Considering the list of Non-timber forest products in table 4, Mbegati is the highest producer per head of Irvingiaceae followed by Bajoh, Abat and then Bakut. Bayip-Ossing, Bajoh and Basu placed in descending order of importance are the main producers of *Gnetum africanum* (eru). *Elaeis guineensis* (palm oil) production have an important frequency rate across the villages with palm wine from palm trees serving as the main stable drink of the people. Honey production is done at micro scale destined for local consumption. Most at times,

only bee hives found in the forest and farms are harvested with the use of fire with consequences such as the killing the bees or the burning of the tree hosting the bees.

Domestication is fast becoming a reality as a large majority of Non-timber forest products formerly found only in the forest are now domesticated in farms pointing to the assertion by Sigund and Espia (1991) that some well-known plants of the tropics and subtropics were some years back found only in the forest. The formation of native farmers on the new scheme for the domestication of *Gnetum (spp)* by the Centre for Nursery Development and *Gnetum africanum* (Eru) Propagation (CENDEP) in Limbe Cameroon has not been extended to the area. Some Non-timber forest products like *Irvingia sp* are domesticated while others like; *Raphia sp*, *Elaeis guineensis*, honey bee and *Garcinia kola* initiative is far fetch. Plants such as *Ricinodendron heudelotii*, *Scorodophloeus zinkeri*, *Cola accuminata*, *Cola nitida* seedlings and other useful plants are protected when found growing in farms inside the forest but cannot be replanted as transplanting of most tropical species of forest origins using present agronomy knowledge is not quite a reality.

In principle Non-timber forest products are generally owned but domesticated species (through protection on farms) has brought private ownership improving production and trade. For the time being, domestication only applies to the protection of forest species producing Non-timber forest products growing on farm lands rather than the actual planting of their seeds. The quantity of products extracted depend on the number of farm lands, the size of the farms and the number of forest species producing Non-timber forest products found on the farm.

Figure 4. farm Sizes and Non-timber forest products density

Source: Afungang R.N (2012)

Inventory on farms in the area (Figure 4) gave varying results on forest species density producing Non-timber forest products. Abat is the highest community with households owning many farms where food crops, cash crops and non-timber products grow side by side. Bakut community has large farms more than the other communities because of their deep involvement in cocoa farming. Nine forest species producing Non-timber forest products were identified present on farms. Most farm lands are small holdings with 36.7% of these farms measuring less than 10m² as against 6.9% of farms measuring above 71m². Bakut has an estimated 25% of all farms measuring 60m² and is the leading cocoa production community in the area mixed with a good number of Non-timber forest products types. Mbgegati fall within the group of large farms communities accounting for about 25% of all farms measuring 61m² to 70m². Basu forced by environmental set-backs is the least community with the lowest number of farms below 10m² and more than 71m². Contrary to this fact, Basu have a relatively high number of Non-timber forest products (four) present on individual farms. The entire zone has an average of 3.7 farms harbouring NTFP species.

3.2. Associated activities in the area (Agriculture, poaching and fishing).

Agriculture, poaching and fishing are the other activities producing non-timber forest products in the area. Agriculture is the predominant activity in Korup park periphery and is a partner activity to Non-timber forest products exploitation. It involves the production of food and cash crops and the rearing of domestic animal (pig and goat).

Non-timber forest products from poaching include skin, feathers, horns, tusk, cowries, bike, borne from animals and birds and scales from snakes. Guns and traps are the most used hunting tools and bush meat is a vital proteins source. Even though some animals and birds are found in large numbers exploitation using unsustainable means has reduced their population as some animals and birds could rarely be found. In recent years hunting activities have been redundant with the re-enforcement of forest policies and wildlife restrictions orders by NGOs such as WWF, IUCN and government agencies operating around the zone.

Fishing is done on the three principal rivers mainly Munaya, Bakwe, Bablick, Basek and Moayip Rivers. Fishing is done using tools like large nets, fishing guns for large mammals

(crocodile; Alligator etc), baskets and large hocks. Small scale fishing is down on streams such as the Effiba in Bakut village, Nyob and Ahip Mawip in Basu, Kalong in Abat, Ndum Mgbe stream in Mbgegati and Moablick stream in Bayip-Ossing using smaller fishing hocks and nets. Some of these streams are tributaries of the main rivers and witness drastic fall or losses in debit during dry season's facilitation fishing activities. Common caught fish species here are; *tilapia* and shrimp. Unlike poaching which has led to the disappearance of lots of wildlife species, fishing is known to have less negative impacts on the aquatic ecosystem.

3.3. Exploitation practices and impact assessment

The techniques of extracting non-timber products and the impacts are as diverse as the products themselves). Gathering mostly involving fruits is the most use technique because most non-timber forest products exploited in the zone (e.g *Irvingiaceae* and *Racinodendron heudeloitii*) are fruits. Apart from these, other fruit products are harvested still by gathering during fructification period (raining season). Leaves, tree barks and root plants are harvested by cutting, pilling and digging throughout the year.

Some products have many different ways of harvesting them depending on the part to be used (leaves, stem, whole plant, bark, shot etc). While bark pilling through the use of knives and cutlasses account for 32% of exploitation methods, gathering (27%) remain the most used method because it involves most exploited products like *Irvingiaceae* and *Ricinodendron heudeloitii*. Over 90% of Non-timber forest products harvested through bark pilling are medicinal or pharmacological products which are rarely sold. Gathering is used for the exploitation of seeds, fruits, grains and nuts. 16 products are extracted through gathering out of the 59 identified being 27% of total forest plant species used for non-timber products. Exploitation by cutting representing 17% involving some 10 products and involve parts like cane, branches and tree parts. The digging method is used for 14 products represent 24% of exploitation techniques of products from plant origin. *Gnetum africanum* "Eru" which is a leaf plant is one of the most exploited products here and involves picking off its leaves. These leaves reconstitute over a relatively short period and its abundance almost everywhere in the forest.

The exploitation of most products is done on family/household basis involving the father, mother, children and close relatives. Although there exist joint ventures by farming groupings, Non-timber forest products extraction is exempted from joint list activities because these products belong to the community and is the main source of income for most households. There is always the quest for competition to amass more discouraging joint initiatives.

3.4. Concentration of Non-timber forest products and timber producing forest species

Average density of forest species producing Non-timber forest products are evaluated on an equal-distance of 10m long over a stretch of 100m². This enables the exact establishment of species concentration per unit area and possible links that exist between different forest species. Results from inventory combined with inventory from LBGZ, (2005) on Forest management unit (FMU)11001 shows a normal distribution of natural forest with plant and animal populations existing in natural densities. This shows that the FMU is a part of a large landscape level forest containing normal densities of expected forest species. Inventory per 100m² on some samples across the zone show the following densities.

Figure 5. Forest transect of 100m² in Mbgegati and Bakut communities

Source: Afungang R.N (2012)

Transect study in the communities (figure 5) show varying number of forest species and Non-timber forest products types. For instance, Mbgegati and Bakut are the least among the communities with less than 6 and 10 species of forest species producing Non-timber forest products per 100m². Others such as Bayip-Ossing had an average of 16 species of Non-timber forest products per 100m² while Osselle and Basu have just a total of 13 types per 100m² each. There is the increase in volume of non-timber products with increase distance in the forest. This is an indicator of the consequences of massive exploitation over the years in the zone.

Thirty-two (32) types of Non-timber forest products were involved during the transect inventory. The graphs show plots showing distribution and spatial density across each zone. Lumbering inside FMU 11001 has reduced Non-timber forest products there and only Basu and Bayip-Ossing have a high capacity of generating non-timber products in the future. Among the 878 plant species identified from the TRC management inventory (TRC version2, 2010) about 20 species were consider to be of high export value. Inventory results from the transects show potential timber species density of 10 species per 300m² (3.3/100m²) in Bayip-Ossing, 19 species (3/100m²) in Bakut, 10 species (7/100m²) in Basu, 3 species per 100m² in Bajoh and 3 species per 100m² in Mbgegati. A good number of timber species can be exploited per 100m² even though there are a number of species that are protected by legislation either because they exist in limited amounts, endemic species or because they produce very useful Non-timber forest products.

3.5. Transportation

The movement of people and products from one place to the other in the area is by tracks, footpaths and earth roads. Just 3 out of the 7 communities are interlinked by earth roads while a majority of the communities remain inaccessible during most parts of the year. The quantity of products inhabitants are willing and able to extract is usually determined by their ability to transport them from the farm to the communities and later to possible market points. While a large portion of goods are transported on foot on human head, some are transported by motor bikes using small tracks. The use of vehicles (trucks) as a means of transport is generally rare.

Figure 6. Means of transportation across the zone

As could be seen on figure 6, 56% of all non-timber products in the area are transported by head and 27% is transported by motor bikes. The nearness and linkage of Bayip-Ossing to Okoroba by an old earth road makes motor bike transportation highest in the zone. Only 17% of transportation is done by trucks and this is mostly limited to Abat, Mbgegati and Bakut which are accessible by seasonal mud roads. Abat, Bakut, Osselle and Mbgegati do transport their products on their heads, motor bikes and trucks while Bajoh only uses head and motor bikes. The most enclave community (Basu) transports the totality of her products on head using footpaths and bush tracks. The coexistence of agriculture and non-timber exploitation and trade makes it possible for the use of these forms of transport for both products.

3.6. Significance of non-timber forest products to the custom and tradition of “Obang-Ngungie” communities

Exploitation of non-timber products has a great significance in many tropical forest zones and also in the Obang culture. There are quite a good number of Non-timber forest products that are used for traditional purposes such as for rituals, marriage rights, cleansing of the land, prevention of catastrophes, incantations and evocation of spirit beings, sacrifices to the gods and others. Belief in the power and activities of spirit beings is enshrined in the people’s culture and daily life. Traditional celebrations, such as annual festivals, funeral celebration, burial rights and others use a combination of non-timber products such as bitter kola, local kola, rattan, Shea nuts, palm wine, alligator

pepper, animal skin, feathers. They are also used for peace making or conflict resolution amongst families. In most circumstances, treatment is administered after which some incantations had been done following the people's beliefs. For instance, rattan is not only a product used for furniture and infrastructure but serves during rights as linked with the underworld or gods. For example, Palm kernel oil in Bayip-Ossing can only be processed across the main river on the frontier of the village because it is believed to have neutralizing powers against certain spirits casted to protect the community. Further again, the Kpwe plant (mkwe) is considered very important in the Ejagham culture. It is the plant used to cover the forehead of any high calibre wild beast (old huge monkeys, chimpanzee, buffalo, bush dog, etc) shut by hunters before it is being brought to the village with the belief that this plant prevents the re-transformation of the beast in case it was a human being who transformed through witch craft. *Picnanthus* "Calabot tree" is usually used for the carving of masks used by masquerades during festivals and other sculptures used for decoration and spiritual fortification of the "Ikpwe" (secret society) meeting compound.

Nutritionally, *Capsicum frutescence* or *Piper guineensis* is used in almost all traditional meals and is a fundamental ingredient used during traditional weddings to bless the bride. The sharing of *Garcinia kola* and *Cola accuminata* or *natida* (bitter kola) is considered a sign of friendship and peace amongst those who eat together. An assurance of final settlement of a dispute and acceptance of peace terms by both parties is confirmed by the consumption of a single piece of kola nut by the rival parties. Palm wine is the most consumed source of alcohol in the entire area. Though with the introduction of modern drinks as beer in the area, palm wine is the most consumed and used in partial totality of traditional ceremonies, rituals and entertainment. It's widely used in libations and incantations and believed to be a blend or forms a contact point between the people and the gods and have powers of appeasement. The drinking of palm wine from the same container using a sing cup passed round from person to person show trust ad mutual acceptance.

3.7. Economic importance of non-timber forest products in the communities

The economic value of non-timber products and agricultural products (figure 7) is done following method extracted from Relm, S and Espig, G (1991) and identify three groups; low, Medium, and high valued products.

Figure 7. Value of Non-timber forest products as perceived by communities

Source: Afungang, R.N (2012)

“Low” refers only to locally used products consumption in very small quantities, “medium” refer to locally used and traded products but of which sometimes are of high economic value while “high” refers to significant economic value products mostly used for trade, nutrition and other purposes.

Within the 59 products exploited, only 22% are classified to be of high economic value for export. A large majority (49%) of products are household consumed oriented products. Only 34% of non-timber products here are averaged valued, locally traded and sometimes of high value. Most of the high valued products for export are harvested on seasonal basis with poor tools making it difficult to have quality goods. This situation is again dampened by the fragile and fetish markets, low conservation rates, difficult accessibility and low prices for Non-timber forest products. The absence of an efficient price and quality control system coupled with the numerous middlemen interferences increase operation cost as producers (local population) are exploited by these interferences. According to present exchange rate, one (1) euro equals 655 francs cfa.

Out of the 184 sampled across the area, 27 % earn between 1.000 and 10.000 Fcfa per month. 26 % households earn between 11.000 and 20.000 Fcfa while just 5 % of households earn between 41.000 and 69.000 Fcfa. Contrary to this, there were an exceptional 7 % of households earning above 70.000 Fcfa a month. The power law or law of economic imbalance where “the rich get richer while the poor get poorer” also hold in this area. The average income per head in each of the communities need not be desired considering the national and international classifications of poor communities. 85.8% of the population live below 40.000 Fcfa a month while only 9.2% mostly traders and public administrative staff can afford to have 70.000 Fcfa per month. These statistics indicates the extreme poor state of the economy with most people living on less than 200 Fcfa per day which is far below the national poverty index.

3.8. Commercialization of Non-timber forest products in the study area

Among the five major forests producing species of Non-timber forest products found in the zone, *Irvingia gabonensis* is the highest fetcher of income for households and contribute significantly to the local economy. Estimated household revenue from *Irvingia gabonensis* ranges from 56.000 to 168.000 Fcfa per year. The entire zone (seven communities) raises estimated revenue of 17.976.000 Fcfa annually from the sale of approximated 593 bags of *Irvingia gabonensis*. Household annual quantity sold ranges from 2.8 bags in Basu to 5.6 bags in Abat. Bakut has the highest revenue and best prices among the communities with total revenue of 4.795.000 Fcfa gotten from the sale of about 137 bags of *Irvingiaceae* with a bag costing 35.000 Fcfa each. Contrary to this, Basu which is the smallest community and with the most remote location have approximate yearly revenue of only 280.000 Fcfa from the sale of 14 bags of *Irvingiaceae* with each bag sold averagely at 20.000 Fcfa. Each household gets about 56.000 Fcfa per annum. Of interest here is that, Basu with this overall mega revenue has a much higher household revenue vis a vis other communities. *Ricidendron heudeloti* trade on its part is more elastic than that of *Irvingiaceae* because it can be preserved locally simply by drying the seeds up to a year making it possible to gain from higher market prices during periods of scarcity and increase demand. Trade in *Ricidendron heudeloti* gives an estimated income of 1.588.050 Fcfa to the seven communities with

an average of 226.865 Fcfa per village. Due to the light nature of this product, transportation is easy and price differences are minimized. The price per cup measuring about 20cl varies from 300 Fcfa in Basu to 400 Fcfa in Bakut and Abat. In 2011, findings show that an approximate total of 4.126 cups of *Ricidendron heudeloitii* was sold with Abat contributing 988 cups. This gave estimated revenue of 395.200 Fcfa with each household getting about 15.600 Fcfa. This trade could have been more lucrative if setbacks like damage by weevils and modern storage facilities were used. Some households due exploit *Ricidendron heudeloitii* just like other food crops.

Gnetum africanum “Eru” is a popular Non-timber forest products exploited over many decades in the region. The trade in this product contributes substantially to household incomes and its demand and supply is very elastic especially in tropical area (Hondet, E. 2012). Due to the large consumption of this product all around the Cameroon and neighboring Nigeria (Nkwatoh, 2010), this product has become very popular fetching about 1.614.700 Fcfa in 2011. Households raise about 7000 to 33.550 Fcfa annually from an estimated sale of 7108 bundles to traders. Bundle sizes vary as there is no given weight. On average, a bundle of *Gnetum africanum* should be able to be handled by one adult hand with five fingers in place. Further, the absence of a standardized measurement gives rise to price fluctuation as smaller bundles with less weight will be bought at lower prices than large and heavy bundles.

Capsecum frutescens “bitter kola” and *Cola accuminata/natida* products are widely exploited and consumed across the area. Between the two species, *Capsecum frutescens* fetches more money than *Cola accuminata* or *nitida*. Production is not important as these species mostly bear fruits only after three to five years interval. The seeds are sold in small bags capable of holding 15 liters. The seven communities in 2011 produced an estimated amount of 155.5 bags of kola nuts which was sold at prices ranging from 5.000 Fcfa to 15.000 Fcfa per bag. This brought approximated revenue of 1.205.500 Fcfa with Mbgegati community having 375.000 Fcfa alone. Price variation is also a common factor affecting *Capsecum frutescens* trade. Abat has the best selling price of 15.000 Fcfa followed by Bakut with 12.000 Fcfa per bag. Average household production for Bakut is 4.6 bags being the highest in the zone. She has 4 trees per producing Non-timber forest products per 100²m. Increase in internal demand and

expansion of nearby urban towns such as Kumba, Mamfe, Douala, and Nigerian towns of Ikom and Calabar, distance and bargaining power differences in this local trade, sentiments and ties has influenced market prices. Apart from the above described products, other non-timber products sold in the area include; *Borassa flabellifer* (palm wine) is sold in 65cl bottles at the price of 75 Fcfa per liter, *Baillonella toxisperma* (moabi or njabe oil) sold at 1.000 to 2.000 Fcfa per liter, *Coula edulis* sold at 200 to 500 Fcfa per cup, Rattan widely in weaving baskets, mates and decoration, *Garcinia mannii* which is a small plant used for tooth-brush and lastly thatch used for roofing.

3.9. Non-timber forest products (Non-timber forest products) and agricultural economy compared

Prices for Non-timber forest products are usually higher than those for agricultural products. Price variation margins are not as wide from the period of plenty and periods of scarcity as those for agricultural produce whose prices sharply vary during periods of plenty with seasons. The demand for Non-timber forest products is constantly increasing with more new market destinations. Agricultural products demand is also on constant increase but more gradual than that for non-timber products. Demand trends from 2007 to 2011 (figure 8) was rated on 100 point with 10 being the least.

Figure 8. Demand with changes in population.

Source: Afungang, R.N (2012)

Guided questions using questionnaire and comparing them with reviews indicated that constant increases in population within the area and nearby urban areas calls for high demand. Market forces out of the area influenced the sale of food crops in 2007 and 2009 where increases in harvested saw decreases in demand. While the supply of Non-

timber forest products last for just a few months even with its diversity, the supply for agricultural products is more elastic lasting many months even though peak supply periods (May to September) due intervene in this circle.

Figure 9. Seasonal variation in the market

Source: Afungang, R.N (2012)

The demand and supply trend of Non-timber forest products (figure 9) is constantly changing. Across the tropics, the dry season is the lowest business period for both agricultural and Non-timber forest products (FAO 2012) that normally last from March to September. There is a slight increase in Non-timber forest products supply in February and March because during these months, *Irvingia wabulu* (bitter mango) that has been domesticated is harvested and there are left overs of other Non-timber forest products that could not be sold during the June-September market season. Dried *Ricinodendron heudelotii* is also cracked and prepared for sale.

Before 1970 and right up to early 1990s, there were lots of different types of non-timber products lying unexploited in the forest. From the 1990s, the economic crisis and devaluation of the Fcfa coupled with government interest in the NKP brought a re-awakening and increasing interest in products from the Korup forest. Following data on demand and supply, there is constant increase in demand. Efforts made to domesticate some species to boost supply have fallen short of expectation with many households resorting to intensive exploitation. Exploiters confirm that there is a noticeable shortage and disappearance of some forest species indicative that future generation may be confronted to quantitative and qualitative scarcity. A typical example is *Scorodophloeus*

zinkeri (bush onion) which is now found only in distant forest areas far off from the reach of many inhabitants. Increase expansion and clearing of farm lands for cash crop (cocoa) production has seen some patches of the forest which usually produce some Non-timber forest products destroyed.

4. Discussion

Considering results from the findings, some opinions from the review are binding, complementary while others are not. The idea that non-timber forest products are the only free resources from ancestral inheritance available at no cost serving as an economic life-jacket in sustaining livelihoods (Colchester et al., 2006., IUCN 1993) was confirmed by multiple examples of Non-timber forest products identified above. With continuous poaching and almost no rearing taking place in the area, it was also confirmed that eating and nutritional habits of the local communities depend mainly on proteins from animals and fish, vegetables and fruits, (Tiomo 2010; Ngaliim 2011; TRC report version 2, 2010 and Belcher, 2005).

The many uses of Non-timber forest products for customary purposes confirmed that Non-timber forest products exploitation is a traditional life-style that has taken place in the region for decades (Nsai 2012., Clay and Clement 1993., Ndoeye 1995) and the idea of its commercialization is recent with the coming of development.

This study revealed difficulties in Non-timber forest products extraction and sale as influential “self-interested” stakeholders have marked out access to forest thereby prohibiting community access and more significantly, there are legislations prohibiting entry into buffer zones around lumbering or protected (Belcher & Schreckenberg 2007; Belcher 2003; Laird & Kate 2002) thus forcing local inhabitants to remain on very limited area. This is true in the area as the lumbering company (TRC) have access to large swaths of forest land restricting entry.

Considering the difficulties involve in Non-timber forest products trade (Tchoungui et al., 1995; Oyono, 1998) such as small volumes production, unreliable quantity and quality, variation in out-put, dispersed, poorly developed, faddish markets, barriers to entry, Intellectual property rights problems and Certification, inappropriate transportation

technology, unsustainable methods of harvesting, the number of people involve in the sector and the backwardness of the Korup area we can also conclude that Non-timber forest products is not a potential socioeconomic stimulant and cannot be considered as a source of overall household economic survival or a mean of poverty alleviation.

5. Conclusion

From the findings and analyses above, we could conclude by stating the following.

Those non-timber forest products contribute to people livelihood in the Korup park support zone but couldn't by itself assure sustainable livelihood. That, the commercialization of non-forest products have gain precedence grace to economic hardship in the area and lack of other natural resources. That agriculture is fast gaining grounds to the detriment of non-forest products and forest conservation. And that the development, control and stabilization of non-timber forest products and agricultural products could play a major role in alleviating poverty in the area.

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