IMPORTANCE OF WILDLIFE AND NON-TIMBER FOREST PRODUCTS OF THE CROSS RIVER RAINFOREST, NIGERIA

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INTRODUCTION

The Cross River rainforest is a tropical rainforest located in Cross River State (Latitude 4°40-7° North and longitude 7° - 9°50' East), Nigeria. Cross River State is bounded in the East by the Republic of Cameroon, in the West by Ebonyi, Abia and Akwa Ibom States, in the North by Benue State and in the South by the Atlantic Coastline. The state has a total land area of 2,127,500 ha of which 748,400 ha is tropical high forest, inclusive of disturbed, open forest and the montane forested areas in the North-East of the state. Fallow land and farm land, designated by Otu and Dunn (1994) as 'not forest' and regenerating forest is approximately 1,229,900 ha and occupies 57.8% of the state. The rainforest of the area is one of the richest in species diversity and endemism in the world, and it is a home to over 700 species of plants and animals; over 430 of these species are used by local residents (CRSFP, 1994). It ranks among the largest contiguous rainforest left in Africa and has greater potential for perpetual economic benefits to the local communities in its non-timber forest products (Anon, 1996).

According to Abu and Adebisi (2002), many people in forest fringes rely on collection and sale of forest products to supplement

their farm income. Abu and Adebisi (2002) also reported that in some forest zones of West Africa as much as a third of local income in forest fringe villages can come from forest produce. The enormous economic, social, cultural and environmental value of this rainforest necessitates attention and immediate action to tackle the problem of the area. However, it is not just timber harvesting but loss of certain species as a result of harvesting of non-timber forest resources that causes damage to the Cross River rainforest. According to Popoola (2000), the annual rate of forest loss in Nigeria is alarming. Corroborating this view, Burn *et al.*, (1994) estimated that over 19 percent of the tropical high forests of Cross River State have been lost over the last twenty years. The constraints of forest management in Cross River State include deforestation, poaching, lack of funds for effective conservation and establishment of sustainable management option for communities living in the rainforest (CRFSP, 1994).

According to Azeke (2002) there is increasing awareness and recognition that throughout the country forests contribute significantly to rural economy providing non-timber forest products (NTFPs), subsistence goods and services as well as marketed items with a great diversity of products. Etukudo (2001) defines non-timber forest products as all the biological materials (other than industrial round wood and derived sawn timber, wood chips, wood based panels and pulps) that may be extracted from forest ecosystems and are utilized within the household or are marketed. The lives of majority of the rural people of Cross River State somewhat are linked to the forests, socially, economically and spiritually. The non-timber forest products of Cross River rainforest include wildlife (bushmeat), forest spices, wild vegetable, medicinal herbs, fruits and seeds. Others include rattan, oils, alcohol, mushrooms and honey. The money generated from the sales of NTFPs enables the ruler dwellers to participate in the local economy and contribute to the well being of their families.

The objective of this paper is to discuss the utilization of wildlife and other non-timber forest products in the rain forest zone of

Cross River State. The paper also suggests a people-friendly community forestry intervention that will ensure the survival of the forest and its resources for generations yet unborn

UTILIZABLE WILDLIFE SPECIES OF THE CROSS RIVER RAINFOREST

Wildlife, a non-timber forest resource is one of the important biological resources of the Cross River rainforest. The demand for wild animal meat is so high in the area that populations of many species are seriously threatened with extinction. Wildlife products (meat, bones, scales, fur, feathers, etc.) some of which have ornamental, cultural, aesthetic and medicinal values are often traded in local markets providing direct income to hunters and traders (Edet *et al.*, 2005). The value of wildlife in the area makes hunting one of the major occupations of households living in the enclaves of the Cross River rainforest. Majority of the inhabitants of rural communities of Cross River rainforest prefer bushmeat to domestic animal product, and rodents are often preferred to any other group of wild animals. About 64% of local people of enclaves of Cross River National Park prefer cane rat *(Thryonomys swinderianus)*. Other utilizable wildlife species in the area include the porcupine *(Antherurus africanus)*, giant rat *(Cricetomys gambianus)*, guinea fowl *(Numida meleagris)*, grey duiker *(Sylvicapria grimnia)*, bush fowl *(Francolinus spp)*, monitor lizard *(Veranus niloticus)* and species of monkeys (Edet, 2004). Some animals are rare, but they are also hunted for their meat for food, trophies and other ethno-zoological values (Table 1).

These animals are the buffalo *(Syncerus cafer)*, forest elephant *(Loxodonta africana cyclotis)*, Cross River gorilla *(Gorilla gorilla dielhi)* and chimpanzee *(Pan troglodytes)*. Local Government Areas noted for abundance of bush meat in the Cross River State are Etung, Boki, Akamkpa and Biase. According to Edet *et al.*, (2005), though many local people of the Cross River rainforest are aware of the need to conserve the biological resources of the area; they are constrained to embrace conservation because of abject poverty.

Table 1: Some wildlife resources and their socio-cultural values in Cross River State

Zoological name	Common name	Cultural uses
Gorilla gorilla diehli	Cross River gorilla	Hunter is placed in a special elite class when gorilla is killed.
Manis gingatea	Giant pangolin	Scales are ground into powder and use for the cure of rashes. Meat is used in preparation of delicacies during cassava and new yam festivals
Tragelaphus scriptus	Bush buck	Skin usually wore by traditional wrestlers during competitions. Skin also used for interior decorations and drum making.
Bitis gabonica	Gabon viper	Spleen used for the preparation of poisons.
Python sp	Python	Fats are used for the treatment of fractures and dislocations
Cricetomys emini	Giant rat	Meat used in the preparation of charms for love and good luck.
Geochelonis pardalis	Leopard tortoise	Shell used as musical instrument.
Pan troglodytes vellerosus	Nigerian chimpanzee	Bones soaked in water with other ingredients to make vigour medicine for children.
Loxodonta africana cyclotis	Forest elephant	Same as gorilla.

Source: Edet et al., (2005)

Thus, it becomes difficult to convince such individuals to remain in abject poverty in order to conserve the biological resources of the forests around them. Attractive prices offered for bushmeat is another factor responsible for the decline in wildlife species. Bushmeat is an important delicacy, which is enjoyed during festivities, especially new-yam festivals in the area; hence it

attracts high prices than domestic animal meat like beef and pork. The high prices make hunters more determined to adopt disingenuous means of hunting. This is a form of vicious cycle because the more scarce and expensive the wild animals, the more intense the hunting and depletion of wildlife. For instance hunters living in the enclave of the Cross River National Park can make between ₦30, 000.00 and ₦ 40, 000.00 for the sale of an average sized buffalo (*Syncerus cafer nanus*). This species is seriously endangered, and currently under protection in protected areas like the Cross River National Park, Afi Mountain Wildlife Sanctuary and forest reserves in Cross River State. Another factor responsible for the decline of wildlife resources in the Cross River rainforest is lack of law enforcement. It is a common observation to see bushmeat being displayed by hunters for sale along major roads in Cross River State without apprehension. Typical example is the Calabar-Ikom and Ikom-Cameroon highways. Some of the animal species which are protected by the Endangered Species Decree 11 of 1985 and often displayed are giant pangolin (*Manis gigantea*), drill monkey (*Mandrillus leucophaeus*), brush-tailed porcupine (*Antherurus africanus*) and parrots. Other wildlife species which are also displayed include cane rat (*Thryonomys swinderianus*), guinea fowl (*Numida meleagris*), bush buck (*Tragelaphus scriptus*), and grey duiker (*Sylvicapra grimmia*). Some of these animals are often caught in protected areas in the state, and hunters (poachers) involved often get light penalty if caught, as fines imposed on poachers are not commensurate to the gravity of offence committed. For instance the maximum penalty imposed on any poacher caught in National Park with or without wildlife is a fine of ₦ 2,000.00 (Edet, 2004).

SOME NON-TIMBER FOREST PRODUCTS OF ECONOMIC IMPORTANCE IN ENCLAVES OF THE CROSS RIVER RAINFOREST

To majority of the people of the rainforest of Cross River State the values of the forest lie on the products especially non-timber forest products (NTFPs) that they derive from the forest. Hence, the utilization and trade of these products play important role in the lives of these people. Non-timber forest products are sources of

food and income. These products also play important roles in cultural and spiritual lives of the people as well as traditional medicine (Table 2).

Table 2: Some medicinal plants of the Cross River Rainforest

Family	Scientific name	Medicinal use	Parts used
Acanthaceae	*Brillantaisia vogelliana*	Anaemia	Leaves
Acanthaceae	*Acanthus montanus*	High blood pressure	Leaves
Acanthaceae	*Lepidagathis alopecuroides*	Sores	Leaves
Ampelidaceae	*Leea guineensis*	Stomach upset	Leaves and roots
Annonaceae	*Enanthia chlorantha*	Malaria and typhoid	Bark
Annonaceae	*Xylopia aethiopica*	Back and chest pain	Bark and roots
Apocynaceae	*Alstonia boonei*	Abscess	Leaves
Apocynaceae	*Funtumia elastic*	Dysentry	Leaves
Apocynaceae	*Rauvolfia vomitoria*	Haemorrhage	Bark
Bignoniaceae	*Newbouldia laevis*	Aphrodisiac	Bark and roots
Buseraceae	*Canarium schweinfurthii*	Worm expeller, stomach pains	Bark
Compositae	*Aspilia Africana*	Ear infection	Leaves
Compositae	*Vernonia guineensis*	Worm expeller	Leaves
Cucubitaceae	*Momordica gilgiana*	Acute stomach pain	Leaves
Cyperaceae	*Mariscus dubius*	Pneumonia	Leaves
Euphorbiaceae	*Phyllantus amarus*	Malaria and typhoid	Leaves
Euphorbiaceae	*Phyllantus muelleriaus*	Stomach pain	Leaves
Guttiferae	*Garcinia kola*	Cough	Seeds
Icacinaceae	*Lasianthera Africana*	Contraceptive	Leaves
Moraceae	*Ficus exasperate*	Skin infection	Leaves
Moraceae	*Musanga cecropioides*	Anti-natal agent	Leave ligule

Family	Scientific name	Medicinal use	Parts used
Ochnaceae	*Lophira alata*	Rheumatism	Bark
Orchidaceae	*Graphorida lucida*	Ear infection	Whole plant
Piperaceae	*Piper umbellatum*	Infertility	Leaves
Plumbaginaceae	*Plumbago zeylanica*	Rheumatism	Leaves and roots
Polygalaceae	*Carpolobia lutea*	Aphrodisiac	Roots
Rubiaceae	*Morinda lucida*	Ulcerating abscess	Leaves and bark
Rubiaceae	*Rothmania longiflora*	Filariasis and fever	Leaves, roots, bark
Rutaceae	*Zanthoxylum xanthoxyloides*	Sickle cell	Bark
Scrophilariaceae	*Scoparia dulcis*	Diabetes	Whole plant
Smilacaceae	*Smilax kraussiana*	Child labour, fever	Stem-twigs, roots
Sterculiaceae	*Mansonnia altissima*	Leprosy	Bark
Tiliaceae	*Grewia flavescens*	Lactating mothers	Leaves
Verbenaceae	*Lantana camara*	Aniseptic, fever	Leaves
Zingiberaceae	*Afromomum melegueta*	Chickenpox, coughs	Leaves, seeds
Zingiberaceae	*Costus afer*	Snake bites, malaria	Stem, juice, roots

Source: Edet (2010)

Mushrooms, spices, wild vegetables, seeds, leaves, roots, fruits, rattan and dye are utilizable products derivable from the Cross River rainforest. A survey carried out by Edet (2010) reveals rich utilizable non-timber forest products, some of which are of great economic value to the local people. Some of these species and their economic value are highlighted below:

Lacospermum secondiflorum / *Eremospatha* sp. (Family: Palmae).

Common name: Cane plant or climbing palm

Rattans are climbing palms of potential economic importance in Cross River State. Bundles of cane palms are collected at many communities on a small scale. Most communities within the Cross

River National Park and Afi mountain sanctuary including Awe, Akamkpa and Boki of the Cross River rainforest have rattan in abundance in their communal forests. Most of the communities harvest and use small quantities in construction of houses, for fabricating household goods such as garri sieves, baskets, and furniture, and for tending yam shoots in farms. Dealers operating in Ikom since 1993, send up to 14 to 35 tons per month to furniture factories in Onitsha, Jos, Kano and Lagos (Edet, 2010). Canes in three diameter classes ranging from 1-4cm are traded, but the various types are further distinguished by their drying and working properties. The main source of 3-4cm cane appears to be *Lacosperrnum secondiflorum*, while that of 2-3cm is *Eremospatha* sp. and are often cut into 3m and 9m lengths respectively, and 45-50 lengths of either type make a bundle which is sold at the loading site for about ₦4, 000.00K Since 180 to 200 bundles of either species make one lorry load, each load is worth about ₦720, 000.00K to ₦800, 000.00K. Thus, if sustainable harvesting techniques are followed, coupled with the abundance of the resource in the forests, rattan harvesting and trade have the potential of sustaining the livelihoods of many households in the area. Small scale cane products industries abound in the area especially in Akamkpa, Etung and Boki Local Government Areas of the State. Cane chairs, cupboards trays and tables are very common in local markets. Twenty-five percent (25%) of Awi people in Akamkpa Local Government Area are craftmen, who are into cane product manufacturing (Edet *et al.*, in press). Cane products also abound in villages of Bendeghe (Etung L.G.A) and Bashu (Boki L.G.A). Presently, there is a thriving export trade in cane products in the state. The cane products are often exported to neighbouring countries of Cameroon, Benin Republic and sometimes Europe and America. This is a boom to cane products makers in the area.

Gnetum africanum and G. buckholzianum (Family: Gnetaceae)
Common name: African Salad.
This forest vine commonly called "African salad" is found both in secondary and primary forests of the State. According to Community Forestry News (2002), the leaves of these wild

vegetables produce significant sources of protein, amino acids and minerals and that 75% salad is exported to central markets in the Eastern towns of Nigeria and as far as Lagos and Abuja. It is also estimated that 530 metric tones of Gnetum is collected and traded annually within Cross River State or exported to other consumer regions (Community Forestry News, 2002).

Women and children are the major harvesters of *Gnetum* species in the State, and this accounts for about 30% of households' income (Community Forestry News, 2002). Currently, Gnetum vegetable is becoming scarce throughout the State due to unsustainable harvesting methods. This is because most harvesters complained of trekking deep into the forest to harvest the vegetable. Awi and Mbarakom (Akamkpa L.G.A), Ibogo (Biase L.G.A), Agoi Ibami (Yakurr L.G.A) and most villages of Boki L.G.A are the major centers of *Gnetum* species collection. The average income made from sales by the local people living in forest enclaves of the state is estimated at ₦58, 000.00K per annum (Edet *et al.*, in press). This therefore calls for sustainable harvesting techniques that would ensure the continuous regeneration of gnetum to meet future demands.

Piper guinensis (Family: Piperaceae)
Common name: Bush pepper or hot leaf.
This woody climber is a local spice, which is sometimes used in the diets of indigenous communities of the forest zone of the state. The seeds and leaves, which produce aroma, are often used to prepare pepper soup. The spice is common throughout the Cross River Rainforest.

Afromomium spp (Family: Zingibraceae)
Common name: Alligator pepper.
The seeds of Afromomium sp. are very important in the traditional lives of the people as they are used for incantations by 'juju' priests, soothsayers, herbalist as well as traditional ceremonies (personal observation). Dried seeds of these herbs are often transported in bags from local markets by indigenous and Hausa

traders to Northern Nigeria where they are utilized for various purposes especially traditional medicine

Mitragyna ciliata and M. stipulosa (Family: Rubiceae)
Common name: Kolanut wrapper
The leaves of these swamp growing trees are used as wrappers for preserving agricultural produce. *Mitragyna ciliata and M. stipulosa* are traditionally used in wrapping kolanuts for long distance transportation to other parts of Nigeria. Thousands of people are gainfully employed in collection and sales of *Mitragyna* leaves. Awi, Mbarakom and Uyanga (Akamkpa L.G.A) as well as some communities of Boki and Etung Local Government Areas are important collection points of *Mitragyna*. According to Edet *et al* (in press), 38% of the rural people of Akamkpa, especially youths are involved in the trade of *Mitragyna* leaves.

Thaumatococcus danielli (Family: Marantaceae)
Common name: moi-moi leaf
The leave of these plants are used as food wrappers. They are important for wrapping food before boiling like beans pudding popularly called 'moi-moi'. The Yakurr people of Idomi and Agoi harvest leaves of *T. danielli* and sell them in large quantity in big markets of Ugep (Yakurr L.G.A). Ajassor and Bendeghe (Etung L.G.A), Edondon and Ochon (Obubra L.G.A), Iko Ekperem and Iko Esai(Akamkpa L.G.A) are among the numerous communities involved in the collection and sale of *Thaumatococcus danielli*. The seeds of *T. danielli* are used as sweeteners while mats are also produced from the split and flattened petiole of the plant.

Pentaclethra marcrophylla (Family: Mimosoideae)
Common name: Oil bean tree.
Seeds of oil bean tree have high fat content and are eaten alone or used as food supplement. The seeds are slightly fermented and cut into small shreds to make a very nutritious snack called 'Ugba,' which is very popular among the Ibos of South Eastern Nigeria. Few persons are into the collection and sale of oil bean seeds. The species is under exploited because very few persons are into harvest and sale of the non-timber forest produce. This

calls for creation of awareness on the economic potentials of *Pentaclethra macrophylla* as it is capable of providing raw materials for soap and pomade industries.

Irvingia gabonensis and *I. wombulu.* (Family: Irvingiaceae)
Common name: Bush mango
The harvest and sale of cotyledons of bush mango is a major source of income for rural communities of the Cross River Rainforest. In Etung and Boki Local Government Areas, about 65% of the indigenous people are involved in bush mango collection and sale, and this accounts for over 20% of family income in the area (Edet *et al.*, in press). The main sources of bush mango collection in the state are Akamkpa, Biase, Odukpani, Boki, Yakurr and Etung Local Government Areas. The cotyledons of the seeds are often bought by Igbo traders who transport large quantities to other parts of the country especially Eastern Nigeria where they are used as soup thickener for the famous 'ogbono soup'.

Elaeis guinensis (Family: Palmae)
Common name: oil palm.
One of the most important non-timber forest products in the state is the palm oil processed from the fruits of the oil palm. It is a major source of vegetable oil and often attracts significant income for those who are involved in the harvest of palm fruits, its processing and sale of the oil. Large quantity of the oil is produced from fruits harvested from oil palm plantations across the state, some of which are owned by farmers. Larger part of these plantations is located in Akamkpa, Biase and Etung Local Government Areas. The oil is often exported to other countries such as Niger. Other derivable products from the oil palm species are the palm wine, broom and palm fronds (fuel), which are utilized locally.

Carpolobia alba and *C. lutea* (Family: Polygalaceae)
Common name: Cattle stick.
The cattle stick is a valuable non-timber forest product of the Cross River Rainforest. According to CRSFC and CRSFP

(2002a), it is estimated that over ₦12, 000000.00K (Twelve million naira) is generated from sales of cattle sticks annually. A survey by Edet *et al.*(in press) carried out in Ikom market shows that an average of ₦10,500.00 (Ten Thousand Five Hundred Naira) is realized from sales of 750 kg cattle sticks. The survey also reveals that non-indigenes dominate the harvesting and transportation of cattle sticks in Ikom, Boki, Akamkpa and Etung Local Government Areas using indigenes as 'fronts', hence the local people benefit little from the harvest and sales. Cattle sticks harvested in Cross River State are supplied to Northern Nigeria or exported to Northern Cameroon, Benin Republic, Niger and Mali where they are used by the Cattle Fulani herdsmen as staff. Cattle sticks are becoming rare to some extent that most traders are now traveling to South Western Cameroon for collection. The scarcity could be due to unsustainable harvesting practices. In most cases, the stem is either uprooted or cut too low to the ground, so that the stump is unable to sprout or coppice

Dacryodes edulis (Family: Burseraceae)
Common name: African pear, black pear.
The black pear, which is found throughout Cross River Rainforest is seasonal (April to October). The black or blue-black fruit is either covered in hot ash or boiled in water and the oily pulp eaten with cooked or roasted corn. Though the pear occurs in the wild more than 80% is cultivated in farms especially plantations where they are inter-planted with cash crops like cocoa and cola. *Dacryodes edulis* is cultivated in this way in Ikom, Etung and Akamkpa where more than 60% is harvested in plantations.

Massularia acuminata (Family: Rubiaceae)
Common name: Randia chewing stick.
The most commonly found chewing stick in Nigeria is that of *Massularia acuminata* which is found in the under-storey of the Cross River rainforest. CRSFC and CRSCFP (2002b) estimated that about 1,350 metric tonnes of Randia are exported from the state annually, and this represent wholesale value of about ₦90,000,000.00 (Ninety Million Naira). The major areas of *Massularia acuminata* collection in Cross River State are Etung,

Ikom and Akamkpa Local Government Areas. The villages along the Oban corridor in Akamkpa provides gateway to the major sources of Randia chewing stick. These villages include Ekonganaku, Neghe, Okarara, Osomba, Mangor and Akor where some of the youths have organized themselves into collecting associations. These associations force non-indigenous dealers to buy directly from them. Non-indigenous traders export Randia chewing sticks to Northern and Eastern Nigeria.

Cola acuminata (Family: Sterculiaceae)
Common name: Kola nut
Kolanut seeds feature prominently in cultural ceremonies, and for welcoming visitors. Other species of Kola used in a similar way are *Cola nitida* and *Cola milleni*. Etung and Akamkpa Local Government Areas are the major areas where Kola nut is produced and are often planted in cocoa plantations. Kola seeds are common in Local markets throughout the state. Bitter kola (*Garcinia kola*: Family Guttiferae) is used in the same way as *Cola acuminata*. The seeds are chewed for their medicinal properties.

CONCLUSION AND RECOMMENDATION

Though, the uses of non-timber forest products by indigenous communities of Cross River rainforest are inexhaustive, they basically provide food, income and also protect the environment. These products also have cultural and social values that keep the tradition of the people intact. But the people stand to lose these benefits as a result of unsustainable harvesting methods and techniques currently in use coupled with gross ignorance about the value and use of some of the NTFPs. Uprooting of plants as harvesting method should be discouraged. This could be achieved if Forest Management Committees are set up, with the aid of the Cross River State Forestry Commission, to enforce these regulations. Extension services is very poor. It is only the community out reach programme that is in existence. Extension services need to be carried out not only to the villages but even to those selling bushmeats.

For the forest vines that produce leafy vegetables, they can be cultivated in farms. For instance, *Gnetum africanum* could be planted with economic trees with wide canopy. The canopy provides shade and encourages adequate growth of the plant. With all these measures, availability of NTFPs will be sustainable while ensuring regular income to forest enclaves. Techniques for propagation and development of a wide range of non-timber forest products (NTFPs) should be developed through intensive research. The rural people should be encouraged to propagate NTFPs by teaching them the proper method of propagation. Encouraging farmers to cultivate them under well managed agro-forestry systems can easily expand the supply of NTFPs. Unless this is done, the utilization and management of NTFPs will remain ineffective and unsustainable, because the present rate of extraction far exceeds that of natural regeneration. Since most of the production comes from the wild, intensive research to improve *in situ* conservation srategies. Establishment of Wildlife Management Committees (WMCs) for the rainforest enclaves is needed urgently. If properly constituted, with well defined roles, WMCs can play a vital role in the conservation of important wildlife within the communal forests. Domestication of wildlife species can be achieved using the WMCs as a channel for wildlife extension services.

The biodiversity of the relic forest may be important reservoir of gene pools. In the face of deforestation and other agents of habitat loss, there is need to safeguard these relic forests which harbour an impressive assemblage of wildlife and other biological resources. Effort to manage the relic forests should be in close cooperation with the Cross River State Forestry Commission, community leaders and environmental non-governmental organizations (NGOs). The local people should be encouraged to manage their biological resources. This could be achieved by reviewing the obsolete laws of biodiversity conservation and incorporating the plight of the local people of forest enclaves in the new law(s).

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