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Short paper

Ethnobotanical study of Buru Community Forest, Taraba State, Nigeria

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Abstract An ethnobotanical study of Buru Community Forest was conducted using Participatory Rural Appraisal techniques. A total of 91 species of plants belonging to 43 Families with high endemicity were recorded. The dominant families were Fabaceae, Euphorbiaceae, and Meliaceae. Many species such as *Tetrapleura tetrapetra*, *Phyllanthus mullerianus*, *Sarcocephalus latifolius* and *Aframomum melegueta* had multiple uses. The three major uses of the species are for medicinal (39 species), edible (33 species) and construction purposes (30 species).

Keywords: Buru community forest, Ethnobotanical, Participatory Rural Appraisal technique.

1 Introduction

Buru is a small, remote rural village in Kurmi Local Government Area of Taraba State, Nigeria. The village is at the edge of a lowland rainforest called Buru Community Forest (BCF). Buru has six other associated hamlets which collectively form Buru community (Obot and Inahoro 2004). By a Participatory Forest Management arrangement with Taraba State Forestry Department, Buru Community Forest is being maintained and managed by the Buru community.

BCF is located between 6^0 5' to 7^0 05'N and 10^0 81' to 10^0 96' E (Figure 1) at an altitude of 314 asl in the foothills of Mambilla highlands and covers an area of 10,800 hectares (Akinsoji 2013). The area faces the rain-laden wind from the Atlantic coast (Chapman and Chapman 2010) with a mean annual rainfall of 290 mm (Bawdwen and Tuley 1969) with bimodal peaks in July and September (Akinsoji 2013). The dry season runs between November and March with a brief spell of dry

and cold harmattan wind in December (Akinsoji 2013). BCF is a fragmented part of the Guinea Forest biodiversity hotspot which extends from Sierra Leone to Congo, and it is known to be one of the 36 biodiversity hotspots of global significance for conservation priorities (Myers *et al*. 2002, Noss 2016). It is rich in biodiversity and it has been designated as an important birding area (Ezealor 2002). The soil is of volcanic origin comprising various ratios of clay mixture hence the ground is characterized by hills and depressions which make the terrain hilly and rugged (Obot and Inahoro 2004). The forest is a lowland rain forest with characteristic vertical stratification and dense canopy coverage draped with lianas and climbers. The forest harbours some endangered species and many IUCN red data list plants. The common forest species include *Khaya grandifoliola, Milicia excelsa, Terminalia superba, Ceiba pentandra, Cola gigantea, Bosqueia angolensis, Khaya ivorensis, Entandrophragma utile, Tetrapleura tetrapetra* and *Zanthoxylum zanthoxyloides*. Buru community is an agrarian community, and the main occupation is farming. Over the years, parcels of the forest had experienced structural changes. For instance, the traditional slash and burn followed by shifting cultivation had turned some of the farmed forest parcels into derived savanna. Some common species of the derived savanna include *Hymenocardia acida, Anogeissus lieocarpus, Uapaca togoensis, Terminalia avicennioides, T. laxiflora, Combretum spp., Crossopteryx febrifuga, Sarcocephalus latifolius* and *Detarium microcarpum.*

Buru is a small settlement of about 600 people dominated by the Tigun ethnic group who are the land-owners (Akinsoji 2013). The others are Ndoros, Kakas, and Mambillas who are migrant farmers. They have lived and survived in this environment for generations with minimal contact with the rest of the world depending only on forest resources to meet their livelihood needs. The major components of the resources are plants. This study was carried out to document how the people use plants for their survival.

2 Material and Methods

The survey was carried out using Participatory Rural Appraisal (PRA) techniques (Martin 1995, McCracken *et al***.** 1998**,** Akinsoji 2003**).** Focus Group Discussions were conducted in Buru and the satellite hamlets. At each site, three groups comprising men, women and youths were engaged in discussions. Two teachers from Buru primary school acted as interpreters. In addition, one-on-one interviews were also held with certain individuals who were passive during the group discussions. Quantitative data collected for Buru and the hamlets were similar, so they were pooled. The validity of information gathered was verified by triangulation (Walter 1998, Akinsoji 2003). The data compiled was further discussed with the participants. Plant specimens were identified and recorded. Those that could not be immediately identified were recorded with their indigenous (Hausa) names. Their botanical

nomenclature was deciphered using Gbile (1980). Those whose Hausa names were not known were taken to Forestry Herbarium in Ibadan where they were identified and confirmed. All the plant specimens in healthy condition were then deposited in Gashaka Herbarium located in Gashaka Gumti National Park.

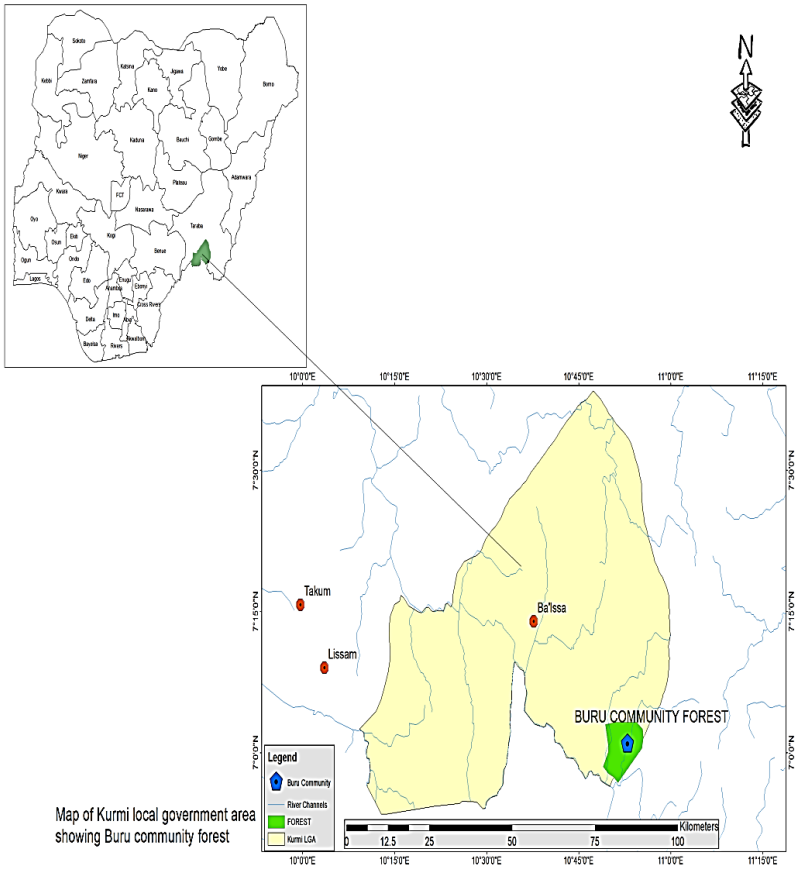

Fig.1: Map of Nigeria showing Buru community forest

3 Results and Discussion

A total of 91 species of plants belonging to 43 families were sampled in Buru community forest (BCF), and interestingly they were reported as endemic to this community. The family Fabaceae dominated with 14 species. The families Euphorbiaceae and Meliaceae had six species each while the Families Apocynaceae and Rubiaceae had five species each. The above five families constituted more than

one-third of all species encountered. Some species such as *Tetrapluera tetrapetra* and *Aframomum melegueta* are used for more than one purpose. *T. tetrapetra* plant is used to treat skin rash and chest pain, while the edible fruit is added to pepper soup for flavor. It is also burnt to give an aroma which is believed to drive away evil spirits. Such multiple purpose plants have been recorded in Gashaka Gumti National Park, Nigeria (Akinsoji 2003), Malawi (Maghembe and Seyani 1991) and in Phillipines (Rondolo 2000). The major uses for plants are medicinal, edible and construction purposes.

3.1 Medicinal plants

Thirty-nine species belonging to 23 families of medicinal plants were recorded in the Buru Community Forest (BCF). The two Families Fabaceae and Euphorbiaceae dominated with five species each while the Family Apocynaceae had four species. The remaining Families had one or two species each (Table 1). The part of plants that is mostly used for medicinal purpose is the leaf. This is probably due to its function as the site of production of biological molecules that have bioactive properties. Similar findings were also reported by Anbarashan and Padmavathy (2010) in India and Phannel *et al.* (2010) in Western Kenya. Nineteen (48.7%) species had their leaves used for treating ailments. Five species had their fruits used for medicinal purposes, while four species had their roots, and four species had their seeds respectively. Three species, *Tetrapleura tetrapetra*, *Anselia gigantea* and *Crinum jagus* are used for magical/mythical purposes. *T. tetrapetra* fruit is used to drive away evil spirits, *A. gigantea* is used as a love charm while *C. jagus* is used as a protective charm. This corroborates Walker (1999) claim that some aspects of traditional medicine are linked with magic.

Table 1: Medicinal plants of Buru Community Forest

Species	Family	Part Used	Uses
Acanthus montanus (Nees) T. Anders	Acanthaceae	Leaf	Typhoid
Alchornea cordifolia (Schum &Thonn.) Mull.Arg.	Euphorbiaceae	Leaf	Malaria
Ansellia gigantea Rchb F.	Orchidaceae	Pseudobulb	Love Charm
Cenchrus ralioides Roxb.	Poaceae	Dried Plant	Impotence
Chromolaena odorata (Linn.) King & Robinson	Asteraceae	Leaf	Wound Dressing
Cissus ralioides (Welw.Ex Bak.) Planch	Ampelidaceae	Root	Dizziness
Celtis ferruginea DC.	Connaraceae	Fruit	Oral Hygiene
Commelina sp Linn.	Commelinaceae	Leaf	Wound treatment
Costus dubius (Afzel.) K. Schum	Costaceae	Leaf	Cough, Mouth Sores
Crinum jagum (Themps.) Dandy	Amaryllidaceae	Leaf	Protective Charm
Culcasia scandens P. Beauv	Araceae	Leaf	Purgative
Erythrina vogelli Hook. F.	Fabaceae	Leaf	Malaria
Euphorbia hirta Linn.	Euphorbiaceae	Leaf	Skin Disease

Table 1. Continued

Species	Family	Part Used	Uses
Garcinia kola Heckel	Guttiferae	Seed	Cough
Ixora brachypoda DC.	Rubiaceae	Sap	Wound Dressing
Jatropha podagrica Hook.	Euphorbiaceae	Leaf	Wound Treatment
Kigelia Africana (Lam.) Benth	Bignoniaceae	Bark	Body Pains
Lophira alata Banks ex.Gaertn.F	Ochnaceae	Leaf	Heart Pain
Macaranga barteri Muell. Arg.	Euphorbiaceae		
Napoleona imperialis P.Beauv.	Lecythidaceae	Root	Fever
Olax subscorpioidea Oliv.	Olacaceae	Stem Sap	Antiseptic
Phyllanthus mullerianus (Kuntze) Ex.	Euphorbiaceae	Leaf	Malaria
Piper guineense Schum & Thonn.	Piperaceae	Seed	Skin Rash
Piper umbellatum Linn.	Piperaceae	Seed	Skin Rash
Rauvolfia vomitora Afzel.	Apocynaceae	Leaf	Malaria
Sarcocephalus latifolius (Sm.) Bruce	Rubiaceae	Root	Gonorrhea, Stomach Pain
Senna alata (Linn.) Roxb.	Fabaceae	Leaf	Skin Diseases
Senna siamea Mill.	Fabaceae	Flower	Activate Lactation
Solanum torvum Sw	Solanaceae	Leaf	Rib Pain
Solenostemon monostachyus P. Beauv.	Lamiaceae		
Stereospermum kunthianum Cham.	Bignoniaceae	Bark	Dysentery/ Stomachache
Strombosia pustulata Oliv.	Olacaceae		
Strophanthus hispidus DC.	Apocynaceae	Leaf	Navel Pain
Tabernaemontana pachysiphon Stapf.	Apocynaceae	Fruit	STD
Tamarindus indica Linn.	Fabaceae	Fruit	Aphrodisiac
Tetrapleura tetrapetra (Schum&Thonn) Taub.	Fabaceae	Seed	Chest Pain, Skin Rash
Vernonia amygdalina Dcl.	Asteraceae	Leaf	Fever, General Tonic
Voacanga Africana Stapf.	Apocynaceae	Fruit	STD
Xylopia aethiopica (Dunal) A.Rich.	Annonaceae	Fruit	Skin Rash
Zanthoxylum zanthoxyloides (Lam) Zepern.& Timler	Rutaceae	Root	Sickle Cell

3.2 Edible plants

Thirty-three species of edible plants belonging to 23 Families were recorded in BFC (Table 2). The family Fabaceae dominated with 6 species while the other species had one or two species each. Twenty-five of the species were trees. The most common edible part was the fruit (19 species) which are known to be source of nutrients and vitamins hence they are good food supplements. The other edible plants were seed (10 species) and leaf (7 species). The seeds are used as spices to add flavour and aroma to foods/ soups while the leaves are eaten as vegetables as well as spices. Some of these have been reported to be sold in Lagos markets (Akinsoji 2017). Hence, Lagos and some other towns could be potential outlets for these plants to

serve as a source of supplementary family income for Buru inhabitants. *Elaies guineensis* is remarkable because at least three of its parts are edible. Its palm oil is used for frying and making of stews, the kernel oil is edible and used in making soap while the sap is taken as palm wine. These edible plants are important in the rural economy by increasing household income for the family as they are harvested and taken to markets for sale. Akinsoji (2003) and Campbell (1987) made similar observations in Gashaka (Nigeria) and Zimbabwe, respectively.

Table 2: Edible plants of Buru Community Forest

Species	Family	Leaf	Fruit	Seed	Tuber
Aframomum melegueta K. Schum	Zingiberaceae			+	
Annona senegalensis Pers.	Annonaceae		+		
Beilschmiedia manni (Meisn.) Benth.& Thonn.F.	Lauraceae		+		
Blighia sapida Konig	Sapindaceae		+		
Brachystegia eurycoma Harms	Fabaceae			+	
Chrysophyllum albidum G.Don	S*apotaceae*		+		
Crassocephalum rubens (Juss. Ex. Jacq.) S. Moore	Asteraceae		+		
Diallium guineense Wild.	Fabaceae		+		
Dacryodes edulis (G. Don) HJ. Lam	Burseraceae		+		
Elaeis guinensis Jacq.	Arecaceae		+	+	+
Irvingia gabonensis Aubry- Leconte ex O Rorke) Baill	Irvingiaceae		+	+	
Kigelia Africana (Lam.) Benth	Bignoniaceae				+
Landolphia owariensis P. Beauv.	Apocynaceae		+		
Maesobotrya dusenii (Pax) Hutch	Euphorbiaceae		+		
Mangifera indica Linn.	Anacardiaceae		+		
Moringa oleifera Lam.	Moringaceae	+	+	+	
Musanga cecropioides Muell. Arg	Moraceae	+			
Napoloena imperialis P.Beauv.	Lecythidaceae		+		
Ocimum gratissimum Linn.	Labiatae	+			
Parkia biglobosa Jacq Benth	Fabaceae		+	+	
Persea Americana Mill.	Lauraceae		+		
Piper guineense Schum. &Thonn.	Piperaceae			+	
Piper umbellatum Linn.	Piperaceae			+	
Psidium guajava Linn.	Myrtaceae		+		
Pterocarpus erinaceus Poir	Fabaceae	+			
Ricinodendron heudelotii (Baill.) Pierre	Euphorbiaceae			+	
Tamarindus indica Linn.	Fabaceae		+		
Tetrapleura tetrapetra (Schum. & Thonn.) Taub.	Fabaceae		+		
Trichilia preuriana A. Juss	Meliaceae		+		
Vernonia amygdalina Del.	Asteraceae	+			
Vitex simplicifolia Oliv.	Verbenaceae	+			
Xylopia aethiopica (Dunal) A.Rich.	Annonaceae		+	+	
Zanthoxylum zanthoxyloides (Lam.) Zepernick &Timber	Rutaceae				+

3.3 Construction plants

Table 3 shows that thirty species of plants are used for construction purposes. These plants belong to thirteen families dominated by Families Meliaceae, Fabaceae and Poaceae. Seventeen of these are timber species while the remaining thirteen are either soft wooded trees (2) or herbaceous species belonging to the Family Poaceae (e.g. *Phragmites and Palisota*). Timber species are used mainly for house construction (roofing, doors and furniture) while the soft wooded species are used for making agricultural implements such as hoe or knife, and cutlass handles. Grasses are used mainly to thatch roofs of huts but some are also used to make baskets, mats, door curtains and chairs which can be sold in markets to support family income. Akinsoji (2003) reported similar results for Gashaka Gumti National Park. *Entada* barks are stripped and used as ropes to tie wooden beams together in thatching roofs with grasses. The timber species are conserved through a joint management agreement with Taraba State Forestry Department. The agreement vests the ownership and management of BCC on Buru community and does not permit commercial logging. Only community members can log for personal building purposes and permission to log must be obtained from Forest Management Committee of the community.

Table 3: Construction plants of Buru Community Forest, Nigeria

Species	Family	Parts used	Use
a) Timber			
Afzelia Africana Sm.	Fabaceae	Wood (hard)	Roofing of buildings, furniture, wooden houses etc,
Albizia zygia (DC.) J.F. Macbr.	Fabaceae	+	+
Aubrevillea kerstingii (Harms) Pellegr.	Fabaceae	+	+
Bombax buonopozense P.Beauv.	Bombacaceae	+	+
Brachystegia eurycoma Harms			
Canarium schwenfurthii Linn.	Burseraceae	+	+
Celtis zenkeri Engl.	Meliaceae	+	+
Diospyros dendo Welw.Ex.Hein	Ebenaceae		
Funtumia africana	Apocynaceae		
Hallea ciliate Aubr.& Pellegr.	Rubiaceae	+	+
Khaya ivorensis C. DC.	Meliaceae	+	+
Khaya grandifoliola C. DC.	Meliaceae	+	+
Khaya senegalensis (Desr.) A.Juss	Meliaceae	+	+
Lovoa trichidioides Harms.	Meliaceae	+	+
Milicia excelsa (Nelw.) C.C. Bery	Moraceae	+	+
Piptadeniastrum africanum (Hook. F.) Brenan	Fabaceae	+	+
Sterculia rhinopetala K. Schum	Sterculiaceae	+	+
Trilepisium madagascariense DC	Moraceae	+	+

Table 3 continued.

	Family	Parts used	Use
b) Non-timber species			
Borassus aethiopum Mert.	Arecaceae	Stem and frond	Roof beams and thatching
Elaeis guineensis Jacq.	Arecaceae	frond	Making baskets and furniture
Entada purseantha DC.	Fabaceae	bark	Rope for tying roof beams
Kigelia Africana (Lam.) Benth	Bignoniaceae	soft wood	Making wooden handles for knives and agricultural implements
Laccosperma secundiflorum (P.Beaux) O Kuntze	Arecaceae	culm	Cane furniture
Oxytenanthera abyssinica (A. Rich,) Munro	Poaceae	stem	Making huts, fences and furniture
Pandanus crassicaulis Huynh	Pandanaceae	leaves	Thatching/roofing
Palisota hirsuta (Thunb.) K. Schum	Poaceae	whole plant	Thatching of huts
Panicum maximum Jacq.	Poaceae	culm	Thatching
Phragmites karka (Retz,) Trin. Ex.steud).	Poaceae	culm	Beds, chairs and thatching
Rothmania hispida (K.Schum)	Rubiaceae	soft wood	Wooden handles for knives and agricultural implements (e.g. hoe)
Vitex simplicifolia Stapf	Verbenaceae	soft wood	Wooden handles for knives and agricultural implements (e.g. Hoe)

4 Conclusions

The study documents how the people in the Buru community in Kurmi Local Government Area use plants for their survival. It revealed high abundance of plant resources in this area and how traditional farming system of slash and burn impacted on the plant resources, though the management option of Buru Community Forest as a result of the agreement between the Taraba State Forestry Department and the community help in adequate protection and sustainability of the forest. This study recommends that inhabitants should be educated on the importance of conservation as continuous exploitation of the plant resouces without adequate conservation strategies can lead to loss of some of these important plant resources.

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