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 tetraptera*, *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° 5' to 7° 05' N and 10° 81' to 10° 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 tetraptera 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 leiocarpus, Uapaca togoensis, Terminalia avicennioides, T. laxiflora, Combretum spp., Crossopteryx febrifuga, Sarcophagephaus 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.

![Map of Nigeria showing Buru community forest](image)

**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 Philippines (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 araloideus* Roxb. | Poaceae        | Dried Plant | Impotence        |
| *Chromolaena odorata* (Linn.) King & Robinson | Asteraceae     | Leaf      | Wound Dressing   |
| *Cissus araloideus* (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* (Themsps.) 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               |
| *Isora 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.Gaern.F| Ochnaceae         | Leaf      | Heart Pain          |
| *Macaranga barteri* Muell. Arg.| Euphorbiaceae     |           |                     |
| *Napoleona imperialis* P. Beauv.| Lecythidaceae     | Root      | Fever               |
| *Olax subcorpoidea* 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           |
| *Rauwolfia vomitora* Afzel.    | Apocynaceae       | Leaf      | Malaria             |
| *Sarcocephalus latifolius* (Sm.) Bruce | Rubiaceae   | Root      | Gonorrhoea, 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 |
| *Strombosisia pustulata* Oliv. | Olacaceae         | Leaf      | Navel Pain          |
| *Strophanthus hispidus* DC.    | Apocynaceae       | Leaf      | STD                 |
| *Tabernaemontana pachysiphon* Stapf. | Apocynaceae     | Fruit     | Aphrodisiac         |
| *Tamarindus indica* Linn.      | Fabaceae          | Fruit     | Chest Pain, Skin Rash |
| *Tetrapleura tetrapetra* (Schum&Thonn) Taub.| Fabaceae | Seed      |                     |
| *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. *Elaeis 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           | +    |       |      |       |
| *Belischmiedia manni* (Meisn.) Benth.& Thonn.F.   | Lauraceae            | +    |       |      |       |
| *Blighia sapida* Konig                           | Sapindaceae          | +    |       |      |       |
| *Brachystegia eurycoma* Harms                     | Fabaceae             |     | +     |      |       |
| *Chrysophyllum albidum* G.Don                      | Sapotaceae           |     |       |      |       |
| *Crassoepalum rubens* (Juss. Ex. Jacq.) S. Moore  | Asteraceae           | +    |       |      |       |
| *Dialium guineense* Wild.                         | Fabaceae             | +    |       |      |       |
| *Dacryodes edulis* (G. Don) HJ. S. Moore          | Burseraceae          | +    |       |      |       |
| *Elaeis guineensis* Jacq.                         | Areaceae             | +    | +     | +    |       |
| *Irvingia gabonensis* Aubry- Leconte ex O         | Irvingiaceae         | +    | +     |      |       |
| *Kigelia Africana* (Lam.) Benth                   | Bignoniaceae         | +    |       |      |       |
| *Landolphia ovariensis* P. Beauv.                 | Apocynaceae          | +    |       |      |       |
| *Maesobotrya dusenii* (Pax) Hutch                 | Euphorbiaceae        | +    |       |      |       |
| *Mangifera indica* Linn.                          | Anacardiaceae        | +    |       |      |       |
| *Moringa oleifera* Lam.                           | Moringaceae          | +    | +     | +    |       |
| *Musanga cecropioide* Muell. Arg                   | Moraceae             | +    |       |      |       |
| *Napoloena imperialis* P. Beauv.                  | Lecythidaceae        | +    |       |      |       |
| *Occimum 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 heudeottii* (Baill.) Pierre        | Euphorbiaceae        | +    |       |      |       |
| *Tamarindus indica* Linn.                         | Fabaceae             | +    |       |      |       |
| *Tetrapleura tetrapetra* (Schum. & Thonn.) Taub.   | Fabaceae             | +    |       |      |       |
| *Trichilia preuriiana* A. Juss                    | Meliaceae            | +    |       |      |       |
| *Vernonia amygdalina* Del.                        | Asteraceae           | +    |       |      |       |
| *Vitex simplicifolia* Oliv.                       | Verbenaceae          | +    |       |      |       |
| *Xylophylia aethiopica* (Dunal) A.Rich.           | Annonaceae           | +    | +     |      |       |
| *Zanthoxyllum zanthoxyloides* (Lam.) Zepemick      | Rutaceae             | +    |       |      |       |

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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 *Pennisetum*). 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                                      |
|-----------------------------|-------------------|------------|------------------------------------------|
| *Afzelia Africana* Sm.      | Fabaceae          | Wood       | 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 | Fabaceae          | +          | +                                        |
| *Canarium schwerfurthii* 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. Berry | Moraceae         | +          | +                                        |
| *Piptadeniastrium 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 purpurea* 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 |
| *Panicum maximum* Jacq. | Poaceae | whole plant | Thatching of huts |
| *Panicum karka* (Retz,) Trin. Ex.steud). | Poaceae | culm | Thatching |
| *Rothmania hispida* (K.Schum) | Rubiaceae | soft wood | Beds, chairs and thatching |
| *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 resources without adequate conservation strategies can lead to loss of some of these important plant resources.
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