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Ethnobotanical Survey of Wild Plants Utilized for Craft Making and Local Construction among the Tiv People of Benue State, Nigeria

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Authors' contributions

This work was carried out in collaboration between all authors. Authors SAS and RM designed the study, wrote the protocol, and wrote the first draft of the manuscript. Authors FAS and SAS managed the literature searches, analyses of the study and discussed the conclusion. All authors read and approved the final manuscript.

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ABSTRACT

Traditional beliefs on wild plants utilization are rapidly eroding worldwide leading to loss of rich traditional practices, knowledge, plant species and habitats. The study focused on identification and documentation of wild plant species used in craft making and local construction among the Tiv people of Benue State. Three Local Government Areas (LGAs) within the Tiv ethnic territory in the State namely; Guma, Gboko and Kwande were purposively selected to reflect the vegetation

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stratification and major sub-ethnic groups of the Tiv people. Information on wild plants locally used for craft making and local construction was obtained through the collection of plant specimens and semi- structured interviews with local residents using group discussions. In craft making, 30 plant species belonging to 20 families dominated by Caesalpinioideae and Fabaceae (4 species each) were documented in Guma, while in Gboko, 13 species in 10 families dominated by Mimosoidae (3 species) were recorded. In Kwande, 22 species belonging to 11 families were recorded and Caesalpinioideae dominated with 5 species. Crafts made ranged from mortar and pestle, local tool handles, recliners, brooms, baskets, bags, sieves, trays, mallets, etc. In local construction, Guma LGA had 13 species from 10 families dominated by poaceae (4 species), 15 species from 14 families were recorded in Gboko while Kwande had 13 species belonging to 11 families. Materials from wild plant species such as rafters, rafter holders, twines and ropes were utilized for thatching of huts and construction of local bridges and culverts. None of the respondents engaged in the planting of the species in spite of the destructive harvesting methods employed for some crafts and local construction works. It is therefore recommended that urgent steps be taken by all stakeholders towards creating awareness on the effects of incessant harvesting of the plant species and the need for regeneration of preferred species for craft making and local construction activities in the area.

Keywords: Ethnobotanical survey; wild plants; craft making; local construction; Tiv people.

1. INTRODUCTION

The forest provides many useful goods and services of subsistence and commercial value which sustain rural people and their economies [1]. The interest and knowledge of plants used by native people, called ethnobotany, has increased in recent years [2,3]. [4] defines ethnobotany as the study of the interaction between plants and people, with a particular emphasis on traditional tribal cultures. Wild plant materials such as fibres, baskets, furniture, bow and arrows, dyes, paints, varnishes and glue constitute craft materials [5]. According to [6], handicrafts are items made by hand, often with the use of simple tools, and are generally artistic and/or traditional in nature. [7] identified craft materials to include fibre, baskets, bow and arrow, dye-paints, glue, varnish, fish traps and local construction activities such as use of palm fronds or grasses for thatching of huts and the general use of sticks and poles for local activities. According to the source, rope making is also a craft and plants such as *Piliostigma thornningii* [Schumach] Milne-Redh*, Phoenix reclinata* Jacq. and *Raphia spps* are some wild plants used for valuable ropes that ease thatching of houses. Though it is true that wild plants have gained renewed interest in recent years and the tradition of wild plants collection continues to date [8,9], their sources and uses are under severe threat as a result of economic globalization, environmental degradation and cultural homogenization [10]. The rapid decline in biological diversity (species, ecosystems and genetic diversity) is one of the critical challenges of the 21st century [11,12], just as it is with traditional beliefs which are rapidly eroding worldwide [13]. There is therefore an urgent need to document the traditional knowledge on the uses of plants and also conserve their habitats [10,14]. This study focused on identification and documentation of wild plant species used in craft making and local construction among the Tiv people of Benue State in Nigeria.

2. MATERIALS AND METHODS

2.1 Study Area

Benue state is located in the derived/guinea savannah region in North-Central Nigeria and lies between latitude 6°25'N and longitude 10 ^{0}E. The climate is characterized by wet and dry seasons. The wet or rainy season begins in April-May and ends in October with total annual rainfall ranging between 1,200 - 1,800 mm while the dry season starts in November and ends in March [15,16] and temperatures are mostly high, averaging between 28-32°C and sometimes rising to 37°C [16].

2.2 Data Collection

Information on wild plants locally used for craft making and local construction was obtained through the collection of plant specimens and semi- structured interviews with elders [17,18] and young people using group discussions [19]. Three Local Government Areas (LGAs) in Benue State namely; Guma (Extreme North), Gboko (Benue-Central) and Kwande (Extreme South) within the Tiv ethnic group were purposely

selected to reflect the vegetation stratification and major sub-ethnic groups or kindreds of the Tiv people in Benue State [20]. Elderly men and young people from 3 randomly selected kindreds in each of the LGAs were engaged in group interviews to elicit community level knowledge on plants used for craft making and local construction in their respective communities. Verbal Prior Informed Consent (PIC) of all the participants was obtained before the commencement of interviews in each of the sub-tribes [21]. In each group interview, the people were asked to list the local names of all wild plants used for craft making and local construction using the free listing method [22,7], after which volunteers obtained specimen of each of the plant species listed for further investigation. Each plant was presented to the people to give full information on its uses with respect to craft making and local construction in the community. The plant species investigated were identified from their local names with the aid of a guide provided by [23] and botanical information obtained from standard texts [24,25] with support from virtual herbaria especially Angiosperm Phylogeny Group (APG III).

3. RESULTS AND DISCUSSION

3.1 Wild Plants Used for Craft Making in Study Communities

Thirty (30) plant species belonging to 20 families made up of 26 trees, 3 shrubs and one grass species were documented in Guma LGA as useful plant materials for making different crafts in the area (Table 1). Caesalpinioideae and Fabaceae were the dominant families with 4 species each, followed by Mimosoideae (3 species). Combrataceae and Arecaceae had 2 species each while the rest had one species each. Crafts made in the area were mortar and pestle, tool handles such as hoes, axe and knife handles, canoes, canoe paddles and smoking pipes. Other crafts made were baskets and trays, mats, local stools, wedges and recliners. Plant parts utilized were stems/wood (88.46%) for making mortar and pestle, tool handles, canoe and paddle. Leaves of *Borassus aethiopum* Mart. and *Elaeis guineensis* Jacq. (8.70% each) were used in mats, baskets, sieves and tray making. The harvesting method for canoe building, mortar and pestle making were destructive as they required felling of whole trees.

The dominant craft made in the LGA was mortar and pestle with *Prosopis africana* [Guill. & Perr.] Taub.as the most preferred species due to its very hard, termite resistant, fine grain, easy to carve and durable properties [26,24]. Due to its extensive exploitation, the species was very scarce in the LGA and carvers reported that they travelled to neighbouring LGAs and States to purchase merchantable sizes suitable for mortar and pestle making to continue with the trade. This agreed with the assertion by [27] and [28] that *Prosopis africana* has disappeared from extensive parts of the Sudan and adjacent Sahel savannas. *Pterocarpus erinaceus* Poir. was also one of the preferred species due to its very shiny, heavy and durable properties [24] which made its carved products attractive and marketable.

In Gboko LGA, 12 tree species belonging to 9 families were identified, with Mimosoideae having 3 species, followed by Caesalpinioideae with 2 tree species (Table 2). Most crafts were made from tree stems/wood (92%) except *Strychnos spinosa* Lam. fruits which were carved as snuff containers. *Prosopis africana* was still preferred for mortar and pestle making but due to the unavailability of matured stands, the people explored alternatives in order tree species such as *Kigelia africana* [Lam.] Benth., *Afzelia africana* Smith ex Pers., *Vitellaria paradoxa* Gaertn.f. and *Parkia biglobosa* [Jacq.]R. Br.ex G. Don. Other crafts made in the LGA were tool handles, local stools, trumpets and snuff containers, etc. The stems/wood of tree species was the most utilized plant part (92%) in making crafts, a harvesting method which is destructive and threatens the abundance of preferred tree species.

Twenty-two species from 12 families were recorded in Kwande LGA, Caesalpinioideae had the highest number of species (5 species), followed by Fabaceae (3 species) as Mimosoideae, Arecaceae, Combrataceae and Sapotaceae had 2 species each. The dominant crafts in the LGA were baskets, trays, local beds, ceilings, tables, mats, hats, recliners and liquor steering sticks made mainly from *Borassus aethiopum* and *Raphia sudanica* A. Chev., being palm trees whose leaves and fronds were extensively used in the area for making the crafts. Other crafts made were mortar and pestle, tool handles, canoe and paddle, smoking pipes and drumwood. *Prosopis africana* was acknowledged as the most suitable tree species for mortar and pestle making but due to its scarcity, carvers sought its alternative in other species such as *Khaya senegalensis* [Desr.] A. Juss., *Vitellaria paradoxa, Afzelia africana, Parkia biglobosa, Detarium microcarpum* Guill. & Perr. and *Pericopsis laxifora* [Benth.] van Meeuwen. [24] confirmed the use of *Afzelia africana, Parkia*

biglobosa, Detarium microcarpum, *Vitellaria paradoxa, Khaya senegalensis,* and *Kigelia africana* for mortar and pestle making within the West African dry zones of Africa. Stem/wood portions of plants in the area were the most utilized in craft making (91%) followed by leaves of palm trees (9%), indicating that tree harvesting for craft making in the area was also destructive, the same trend was observed in Guma and Gboko LGAs. The craft merchants who were made up of elderly but mostly young people in all the study LGAs acknowledged that craft making supplemented farming in income generation. Their craft making skills were undocumented but acquired by learning from elders and passing it on from one generation to another. Few plants were called different local names across the sub-tribes in the study area. *Piliostigma thonningii* was known as nyihar among the Ihyarev people of Guma LGA but was known as Igbian kpande and Agabi within the Jeichira and Kwande sub-tribes of Gboko and Kwande LGAs respectively. Similarly, *Detarium microcarpum* Guill. & Perr. known as lienegh in the Ihyarev sub-tribe was addressed as Agalien, Agashidam or Akomboadam by the Jeichira and Kwande sub-tribes, indicating that some differences exists in plant nomenclature of the sub-tribes within the ethnic group.

3.2 Wild Plants for Local Construction Purposes

Thirteen (13) wild plant species belonging to 9 families made up of 6 tree species, 4 grasses (*Urelytrum muricatum* C.E.Hubb., *Imperata cylindrica* [L] P.Raeusch., *Pennisetum pedicellatum* Trin. *and Schizachyrium exile* [Hoschst.] Pilg.), a shrub (*Uvaria chamae* P. Beauv.), a liana (*Saba comorensis* [Boj. ex DC] Pichon) and a herb (*Tephrosia bracteolate* Guill. & Perr.) were identified as useful species in local construction in Guma LGA (Table 4). Most of the species were used in local hut making while few species (*Prosopis africana* and *Anogeissus leiocarpus*) were utilized for local bridge construction over small and medium sized streams and culverts due to their high strength properties and termite resistance. In thatched hut making, 6 species were used as rafters while *Uvaria chamae* and *Saba comorensis* were used as twines. In Gboko LGA, Ten (10) plant species from 9 families made up of 6 tree species, 2 lianas (*Saba comorensis* and *Cissus pulponea* Guill. & Perr.) and 2 grass species (*Urelytrum muricatum* and *Schizachyrium exile*) were commonly used for hut making and local bridge construction, with majority of the species used for thatched hut making (Table 5). Thirteen (13) plant species from 10 families made up of 8 tree species, 2 lianas (*Saba comorensis* and *Uvaria chamae*) and a grass species (*Urelytrum muricatum*) were used for hut making and local bridge construction in Kwande LGA, with majority of the species utilized in making thatched huts and the others for local bridge making (Table 6).

The craft making trade and local construction activities in the study LGAs were facing challenges due to none availability of plant species especially *Prosopis africana* which was said to be common in the region some decades ago [29]. This was attributed to the extensive over exploitation of these wild plants [27,28] for various uses without any conservation measure to replenish them. This was aggravated by the increasing population in the communities, the changing climate and communal conflicts especially with cattle herdsmen in most of the communities which heightened the demand for wild plants utilized in craft making as it became an income safety net for most people with the skills. Similarly, thatching of huts with grass species such as spear grass (*Imperata cylindrica), Schizachyrium exile* and *Urelytrum muricatum* faced threats from chemical farming. *Imperata cylindrica,* the major thatching grass in Tiv communities was threatened due incessant use of herbicides which destroy the rhizome of the plant, thereby eliminating it in the process. The disappearance of *Imperata cylindrica* has brought hardship to affected communities who have resorted to use of alternatives for thatching such as sesame (*Sesamum indicum* L.) stalks and *Pennisetum pedicellatum* which are not as durable and common compared to spear grass. Though most of the harvesting methods for craft making and local construction purposes were destructive, none of the respondents made efforts towards the conservation and protection of these wild plants. This has posed a threat to the sustenance of the species, their utility in the communities and their natural ecosystems.

Few plants utilized in local construction were called different names among the sub-tribes within the Tiv people in Benue state. *Flueggea virosa* [Roxb. ex Willd.] Volgt known as yareghagum in Ihyarev sub-tribe in Guma LGA was known as azizo in Jechira and Kwande sub-tribes. Similarly, *Elaeis guineensis* Jacq known as ikye among the Ihyarev people of Guma LGA was called ivile in Jeichira and Kwande sub-tribes of Gboko and Kwande LGAs respectively.

Table 1. Wild plants used for craft making in Guma local government area

S/No	Botanical name	Family name	Local name (Tiv)	Craft(s) made
1	*Parkia biglobosa*	Mimosoideae	Nune	Stem carved as canoe, branched stems as hoe handles.
2	*Prosopis africana* [Guill. & Perr.] Taub.	Mimosoideae	Gbaaye	Stems carved as mortar, pestle, canoes, hoe handles, local stools, mallets, lorry wedges and drum wood.
3	*Vitellaria paradoxa*	Sapotaceae	Chamegh	Stems carved as mortar, pestle, canoes and stools. Branched stems carved as hoe handles.
4	*Vitex doniana* sweet	Verbenaceae	Hulugh	Stems used for canoe building. It is also carved as bee hives and drum wood.
5	*Daniella oliveri* [Rolfe] Hutch. & Dalz.	Caesalpinioideae	Chiha	Stems for making canoes and stools.
6	*Pterocarpus erinaceus*	Fabaceae	Ngaji	Stems carved as smoking pipes, canoe paddle, axe, hoe and gun handles. The wood is very shiny and durable.
7	*Terminalia avicennioides* Guill. & Perr.	Combretaceae	Kwegh	Branched stems carved as hoe handles.
8	*Bombax costatum* Pellegr. & Vuillet	Bombacaceae	Genger	Stem carved as seats and masquerade mask.
9	*Acacia nilotica* [L] Willd. ex Del.	Mimosoideae	Saa-anula	Stem carved hoe and axe handles.
10	*Piliostigma thonningii*	Caesalpinioideae	Nyihar	Stem carved as hoe and axe handles.
11	*Burkea africana* Hook. f.	Caesalpinioideae	Gbagbongum	Stem carved as highly durable hoe handles.
12	*Hymenocardia acida* Tul.	Hymenocardiaceae	Iikwar-gbande	Stem carved as drum wood.
13	*Pericopsis laxiflora* [Benth.] van Meeuwen	Fabaceae	Giragba	Stem as hoe and knife handles.
14	*Anogeissus leiocarpus* [DC] Guill.& Perr.	Combretaceae	Maaki	Stems carved as hoe handle.
15	*Kigelia africana*	Bignoniaceae	Tiembegh	Stems carved as hoe handle.
16	*Trema orientalis* [L.] Blume	Ulmaceae	Chiese	Stems carved as local trumpets.
17	*Bryophyllum pinnatum* [Lam.] Pers.	Grassulaceae	Igbo	Grass weaved as mats.
18	*Fluggea virosa* [Roxb.ex Willd.] Voigt	Euphorbiaceae	Yareaghum	Stems used as rafter holders.
19	*Khaya senegalensis*	Miliaceae	Haa	Stems carved as canoes and hoe handles.
20	*Hannoa undulate* [Guill. & Perr.] Planch.	Simaroubaceae	Gbur	Stems used in carving masquerade masks.
21	*Anthocleista djalonensis* A. Chev.	Gentianaceae	Korkosu	Stem carved as local flute and drums.
22	*Elaeis guineensis*	Arecaceae	Ikye	Palm fronds processed and weaved as baskets and trays.
23	*Borassus aethiopum*	Arecaceae	Akuugh	Leaves weaved into mats, recliners made from mature dry stems. Mature fronds used in making sieves, trays and beaten into bathing sponge. Fronds also used sticks in steering liquids in large cooking pots, Leaf midrib used in making brooms.

S/No	Botanical name	Family name	Local name (Tiv)	Craft(s) made
24	*Pterocarpus santalinoides* L Her. ex DC	Fabaceae	Sughun	Branched stems carved as hole handles. Slender stems carved as stirring blades.
25	*Sarcocephalus latifolius* [Smith] Bruce	Rubiaceae	Ikyura-ukase	Mature slender stems carved as knife handles.
26	*Detarium microcarpum* Guill. & Perr.	Caesalpinioideae	Lienegh	Stems carved as hoe handles.
27	*Ficus sur* Forssk.	Moraceae	Tur	Exudates serve as good paper binder.
28	*Sida alba* Linn.	Malvaceae	Chinchia	Stems used in making brooms.
29	*Aspilia africana* [Pers.] C. D. Adams	Compositae	Oosu	Dried stems burnt and used in making gun powder.
30	*Tephrosia bracteolate*	Fabaceae	Agea	Slender stems sharpened and used in stacking fresh fish for drying.

Table 2. Wild plants used for crafts making in Gboko local government area

S/No	Botanical name	Family	Local name (Tiv)	Craft(s) made
1	*Afzelia africana*	Caesalpinioideae	Yiase	Stem for mortar and pestle making. Carved as hoe and knife handles
2	*Khaya senegalensis*	Meliaceae	Haa	Stem for mortar and pestle making
3	*Parkia biglobosa*	Mimosoideae	Nune	Stem carved as mortar and pestle.
4	*Ficus asperifolia* Miq.	Moraceae	Hon	Stem carved as hoe and knife handles
5	*Bombax costatum*	Bombacaceae	Genger	Stem carved as stools
6	*Strychnos spinosa*	Loganiaceae	Maku	Dried fruits carved into snuff containers
7	*Kigelia africana*	Bignoniaceae	Tyembegh	Stem carved as mortar and knife handles
8	*Acacia nilotica*	Mimosoideae	Saar	Stem and root base carved as axe handle, branches carved as knife handles.
9	*Vitellaria paradoxa*	Sapotaceae	Chamegh	Stems carved as mortar, canoes and stools. Branched stems as hoe handles
10	*Prosopis africana*	Mimosoideae	Gbaaye	Stems carved as mortar, pestle and drum wood, branched stems carved as hoe handles.
11	*Trema orientalis* [L.] Blume	Cannabaceae	Chiese	Stem used in carving trumpets
12	*Lonchocarpus laxiflorus* Guill. & Perr.	Caesalpinioideae	Gbagbongum	Matured stems carved as local sitting room pillars.

Table 3. Wild plants used for crafts making in Kwande local government area

S/No	Botanical name	Family	Local name (Tiv)	Craft(s) made
1	*Khaya senegalensis*	Meliaceae	Haa	Stem carved as hoe handle, mortar, pestle and canoe making.
2	*Vitellaria paradoxa*	Sapotaceae	Chamegh	Seeds processed into massage oil, stem carved as mortar, pestle, hoe and knife handles.
3	*Afzelia africana*	Caesalpinioideae	Yiase	Stem carved as mortar, Dry pods sawn and used as musical instrument when dancing
4	*Pterocarpus erinaceus*	Fabaceae	Awambe	Stem carved as hoe handle, red colouration used as local dye.
5	*Parkia biglobosa*	Mimosoideae	Nune	Stem carved as mortar and pestle.
6	*Daniellia oliveri*	Caesalpinioideae	Chiha	Branches carved as knife handles
7	*Terminalia avicennioides*	Combretaceae	Kwegh	Stem used carving knife handles**.**
8	*Prosopis africana*	Mimosoideae	Gbaaye	Stem carved as mortar, pestle, stools, drumwood and weaving stakes.
9	*Anogeissus leiocarpus*	Combretaceae	Maaki	Carved as hoe and knife handles.
10	*Vitellaria paradoxa*	Sapotaceae	Hulugh	Stem carved as hoe and knife handles.
11	*Burkea africana*	Caesalpinioideae	Gbagbongum	Stem carved as hoe and knife handles.
12	*Raphia sudanica* A. Chev.	Arecaceae	Ichoo, choo	Tender shoots dried and weaved as rope, bags, local ceiling and hats. Mature dry shoots stacked and sawn as recliners, beds and tables.
13	*Annona senegalensis* Pers.	Annonaceae	Ahur	Stem and root bole carved as axe handle and drum stick. Straight slender stems as spear handle.
14	*Detarium microcarpum*	Caesalpinioideae	Agalien, Agashidam, Akomboadam	Stem carved as mortar, drumwood, axe and hoe handles
15	*Piliostigma thornningii*	Caesalpinioideae	Igbian kpande, Agabi	Stem carved as axe and knife handle.
16	*Syzygium guineense* [Willd.] DC.	Myrtaceae	Mho	Stem carved as hoe handle.
17	*Ficus ingens* [Miq.] Miq.	Moraceae	Hon	Stem carved as hoe handle.
18	*Sarcocephalus latifolius*	Rubiaceae	Ikura-ukase	Stem carved as hoe handle
19	*Pericopsis laxifora*	Fabaceae	Tselama	Stem carved as mortar, knife handles and rafter pillars
20	*Strychnos spinosa*	Loganiaceae	Maku	Stem carved as hoe handle
21	*Pterocarpus santalinaoides*	Fabaceae	Kpagh	Stem bark used as dyes-red colouring
22	*Borassus aethiopum*	Arecaceae	Akuugh	Mature fronds stacked and used as recliners, local beds and steering sticks for beverage making.

Table 4. Wild plants used for local construction in Guma local government area

S/No	Botanical name	Family name	Local name (Tiv)	Local construction use(s)
1	*Pterocarpus erinaceus*	Fabaceae	Ngaji	Stems used as rafters in local huts.
2	*Mytragyna inermis* [Willd.] Kuntze	Rubiaceae	Sohonor	slender straight stems as rafters for local huts
3	*Tephrosia bracteolate*	Leguminosae	Agea	Stems used as rafter holders in local huts
4	*Flueggea virosa*	Euphorbiaceae	Yareghagum	Stems used as rafter holders in huts.
5	*Lophira lanceolata* Van Tiegh. ex Keay	Ochnaceae	Hwarkera	Stems as rafters in huts
6	*Prosopis africana*	Mimosoideae	Gbaaye	Matured stems are used as beams and tracks in local bridge construction, slender stems used as rafters in hut making.
7	*Uvaria chamae*	Annonaceae	Ikyo	Stems used as twines in hut construction.
8	*Anogeissus leiocarpus*	Combretaceae	Maaki	Mature stems used as beams in local bridge construction, straight slender stems used as rafters in hut construction.
9	*Saba comorensis*	Apocynaceae	Ipungwa, Apungwa	Stem used as twine for making hut roofs.
10	*Imperata cylindrica*	Poaceae	Ihila	Thatching of huts, weaved into ropes
11	*Urelytrum muricatum*	Poaceae	Acho	Thatching of huts
12	*Pennisetum pedicellatum*	Poaceae	Alufu	Thatching grass for huts
13	*Schizacchyrium exile*	Poaceae	Chen	Thatching grass for huts

Table 5. Wild plants used for local construction in Gboko local government area

S/No	Botanical name	Family	Local name (Tiv)	Local construction use(s)
1	*Lophira lanceolata*	Ochnaceae	Hwarkera	Slender and straight branches used as rafters in huts.
2	*Anogeissus leiocarpus*	Combretaceae	Maaki	Slender and straight branches used as rafters in huts
3	*Elaeis guineensis*	Arecaceae	Ivile	Tender shoots used as rope in construction of local huts, palm fronds used as stakes in small huts/rest places.
4	*Syzygium guineense*	Myrtaceae	Mho	Slender straight stems as rafters in huts.
5	*Saba comorensis*	Apocynaceae	Pungwa, Apungwa	Young stems used as twines in hut construction.
6	*Schizachyrium exile*	Poaceae	Chen	Termite resistant grass used in thatching of huts
7	*Prosopis africana*	Mimosoideae	Gbaaye	Large straight stems used in local bridge construction.
8	*Cissus pulponea*	Vitaceae	Ager	Stems used as twines during hut construction.
9	*Urelytrum muricatum*	Poaceae	Acho	Thatching of huts
10	*Fluggea virosa*	Euphorbiaceae	Azizo	Stems used as rafters holders in hut construction.

S/No	Botanical name	Family	Local name (Tiv)	Local construction use(s)
11	*Trema orientalis*	Ulmzceae	Chiese	Stem used in carving trumpets
12	*Ficus polita*	Moraceae	Kondam	Bark peel used as rope
13	*Lonchocarpus laxiflorus*	Caesalpinioideae	Gbagbongum	Matured stems used as local sitting room pillars
14	*Sterculia setigera*	Sterculiaceae	Kumendur	Peeled bark as rope
15	*Cochlospermum planchoni* Hook. f	Cochlospermaceae	Kpavande	Peeled bark used as rope

Table 6. Wild plants used for local construction in Kwande local government area

S/No	Botanical name	Family	Local name(Tiv)	Local construction use(s)
1	*Anogeissus leiocarpus*	Combretaceae	Maaki	Slender stems used as rafters in local hut construction
2	*Lophira lanceolata*	Ochnaceae	Ikura-nomso	Slender straight stems used as rafters in hut construction.
3	*Sarcocephalus latifolius*	Rubiaceae	Ikura-ukase	Slender straight stems used as rafters in hut construction.
4	*Prosopis africana*	Mimosoideae	Gbaaye	Large boles used in local bridge construction, over streams.
5	*Mitragyna inermis*	Rubiaceae	Sohonor	Slender straight stems as rafters in hut construction.
6	*Saba comorensis*	Apocynaceae	Pungwa, Ipungwa	Slender straight stems used as twines in local hut construction
7	*Uvaria chamae*	Annonaceae	Ikyo, Ikyoh	Stems used as twines in local hut construction.
8	*Piliostigma thornningii*	Caesalpinioidae	Igbian kpande, Agabi	Stem bark peel used as rope in construction of huts and local sitting rooms
9	*Fluggea virosa*	Euphorbiaceae	Azizo	Used as rafter holders in local hut construction
10	*Pericopsis laxifora*	Fabaceae	Tselama	Stems used in local bridge construction
11	*Urelytrum muricatum*	Poaceae	Acho	Thatching of huts
12	*Raphia sudanica*	Arecaceae	Ichoor, Choor	Tender shoots dried and weaved as rope, bags, hats. Mature dry shoots stacked and sawn as recliners, beds and tables.
13	*Annona senegalensis*	Annonaceae	Ahur	Straight slender stems used as spear handles

4. CONCLUSION

Transfer and utilization of traditional skills in craft making and local construction has provided useful products such as mortar and pestle, canoes, local stools, hoe and knife handles. Other products documented were dyes, drumwood and stick, ropes, bags, mats, baskets, local sieves, thatched huts, local bridges and culverts among others. None of these plant species was under any conservation measure as the people harvested them incessantly even though some of the species have become scarce. This calls for urgent interventions especially in sensitizing the local users and other community members on the effects of continuous destructive harvesting and the possible extinction of these species in ecosystems and on the peoples' livelihoods. In addition, massive planting of these wild plants, promotion and adoption of conservation agricultural practices and protection of the wild plants where necessary is strongly recommended to reduce the current rate of deforestation in the area. Furthermore, studies on the economic analysis of craft making to establish profitability of the trade in study communities will be necessary to ascertain its contribution or otherwise to the peoples' livelihoods and wellbeing. Also, it will be important to study the effects of the incessant use of herbicides on the soil, water, animal and plant resources within study communities and other adjoining communities where this practice is prevalent.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Fuashi NA, Popoola L, Mosua IS, Wehmbazeyi NF, Ndumbe NL, Elah EM. Harvesting and marketing of *Gnetum* species (Engl) in Cameroon and Nigeria. Journal of Ecology and the Natural Environment. 2010;2(9):187-193.
2. Lewington A. Plants for people New York: Oxford University Press; 1990.
3. Simpson B, Conner-Ogorzaly M. Economic botany: Plants in our world New York: McGraw-Hill; 2000.
4. Plotkin MJ. Ethnobotany. Microsoft Encarta, Microsoft, Redmond, Washington; 2006.
5. Andel TV. Non-timber forest products of the north-west district of Guyana. Tropenbos Guyana series 8. Georgetown, Guyana. 2000;13-26.
6. Reddy KN, Chiranjibi P, Reddy CS, Murthy EN, Raju VS. Plants used in traditional handicrafts in north eastern Andhra Pradesh, India. Indian Journal of Traditional Knowledge; 2008.
7. Agbogidi OM. Ethnobotanical survey of non-timber forest products in sapele local government area of Delta State. African Journal of Plant Science. 2010;4(3):183-189.
8. Luczaj L, Köhler P, Pirożnikow E, Graniszewska M, Pieroni A, Gervasi T. Wild edible plants of Belarus: From Rostafiński's questionnaire of 1883 to the present. J. Ethnobiol Ethnomed. 2013;9:21.
9. Lulekal E, Asfaw Z, Kelbessa E, Van Damme P. Wild edible plants in Ethiopia: A review on their potential to combat food insecurity. Afr Focus. 2011;24:71–121.
10. Rajbhandary S, Ranjitkar S. Herbal drugs and pharmacognosy – monographs on commercially important medicinal plants of Nepal. Kathmandu: Ethnobotanical Society of Nepal; 2006.
11. Fonjong LN. Gender roles and practices in natural resource management in the north-west province of Cameroon. Local Environment. 2008;13(5):461-475.
12. Anthwala A, Guptab N, Sharmac A, Anthwald S, Kima K. Conserving biodiversity through traditional beliefs in sacred groves in Uttarakhand Himalaya, India. Resources, Conservation and Recycling. 2010;54:962-971.
13. Ngara R, Mangizvo RV. Indigenous knowledge systems and the conservation of natural resources in the shangwe community in Gokwe District, Zimbabwe. International Journal of Asian Social Science. 2013;3(1):20-28.
14. Sognorini MA, Piredda M, Bruschi P. Plants and traditional knowledge: An ethnobotanical investigation on monte ortobene (Nuoro, Sardinia). J Ethnobiol Ethnomed. 2009;5:6.
15. Nyagba JN. Soils and agriculture in Benue State. In: Denga, D.I. (ed.): Benue State – The Land of Great Potentials: A Compendium. Rapid Educational. 1995; 98-110.
16. Tyubee BT. An analysis of food crop yields and climatic relations in Benue State, Nigeria. Journal of the Nigerian Meteorological Society. 2006;6:1.

17. Tesfaye HB, Sebsebe DW, Zemede W. An ethnobotanical study of medicinal plants used by local people in the lowlands of Konta Special Woreda, southern nations, nationalities and peoples regional state, Ethiopia. Journal of Ethnobiology and Ethnomedicine. 2009;5:26.
18. Perez-Negron, Casas A. Use, extraction rates and spatial availability of plant resources in the Tehuacan-Cuicatlan valley, Mexico. The case of Santiago Quiotepec, Oaxaca. Jounal of Arid Environments. 2007;70:356.
19. Tilahun T, Mirutse G. Ethnobotanical study of wild edible plants of Kara and Kwego semi-pastoralist people in Lower Omo River Valley, Debub Omo Zone, SNNPR, Ethiopia. Journal of Ethnobiology and Ethnomedicine. 2010;6:23.
20. Shomkegh SA, Mbakwe R, Dagba BI. Ethnobotanical survey of edible wild plants in Tiv communities of Benue State, Nigeria. Journal of Natural Sciences Research. 2013;3:7.
21. Jain SK. Ethnobotany in modern India. Phytomorphology golden jublee issue, Trends in Plant Science. 2001;39-54.
22. Reyes-García V, Vadez V, Tanner S, McDade T, Huanca T, Leonard WR. Evaluating indices of traditional ecological knowledge: A methodological contribution. Journal of Ethnobiology and Ethnomedicine. 2006;2:16.
23. Agishi EC. Tiv, Idoma, Etulo, Igede, Akwaya, Hausa, english and scientific names of plants, 2nd edition. Agitab Publishers Ltd Makurdi. 2010;394.
24. Arbonnier M. Trees, shrubs and lianas of West African dry zones, 2nd edition. Cirad, Margraf Publishers Gmbh Mnhn, Germany. 2004;575.
25. Keay RWJ. Trees of Nigeria. Clarendon Press, Oxford; 1989.
26. Orwa C, Mutua A, Kindt R, Jamnadass R, Simons A. Agroforestree database: A tree reference and selection guide version 4.0; 2009.
Available:http://www.worldagroforestry.org/af/treedb/
27. Von May dell HJ. Trees and shrubs of the sahel – their characteristics and uses. GTZ 6MBH, Esuborn; 1986.
28. Vogt KA. Field guide to the identification, propagation and uses of common trees and shrubs of dry land Sudan. SOS, Sahel International; 1995.
29. Aremu MO, Olonisakin A, Atolaye BO, Ogbu CF. Some nutritional and functional studies of *Prosopis africana*. Electron. J. Environ. Agric. Food Chem. 2006;5(6): 1641-1648.

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