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Traditional Knowledge and Skills in Rural Bakongo Communities: A Case Study in the Uíge Province, Angola

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Abstract

Scientific studies on the use of non-timber forest products in Angola and in particular in the Province of Uíge are still insufficient. This study presents the first results of traditional know-how based on forest products used in rural Bakongo communities of Uíge Province. The results obtained in this first scientific expedition show that these forest products are at the heart of life in rural areas and serve for multiple uses: artisanal fishing, construction of dwellings, manufacture of musical instruments, packaging and processing of food, manufacture of furniture, household utensils, etc. 65 plant and animal species of 55 genera and 24 families were documented of those 59 were identified and 6 remained unidentified. The most represented families are: *Fabaceae* (8 species), *Poaceae* (7 species), *Arecaceae* (6 species), *Malvaceae* possess 5 species; *Euphorbiaceae* and *Marantaceae*, each have 4 species.

Keywords

Valorization, Traditional Knowledge, Rural Communities, Bakongos, Uíge

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1. Introduction

For millennia, from primitive man to the present day, rural communities used always traditional knowledge to meet their most basic needs, exploring the natural resources which provide them with firewood for heating, feeding (through hunting, fishing, harvesting etc.), bio-insects, medicine, handicrafts, building materials and furniture, also instruments of music serving for amusement. According to Petit and Dounias [1] through the ages, human societies, strongly dependent on the natural environment, have always maintained extensive knowledge about the resources not only of their environment. And even today, many human groups exploit the wild plants on a daily basis for building materials (…) or during various religious practices [2]. Today, traditional techniques are still current around the world especially in rural areas and particularly in sub-Saharan Africa where a large part of the population lives in rural areas and in extreme poverty, practicing subsistence agriculture in small plots of land and collection of non-wood forest products (NWFPs) for their livelihood and source of income. NWFPs also play an essential role for the population by

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looking for food (fruits, hunting, mushrooms, etc.), building materials (rattan, bamboo etc.), medicines and condiments. They allow diversifying their household income through their commercialization on markets [3].

According to World Forestry Congress in 2015 in the southern Africa, the importance of forests cannot be highlighted enough. They provide significant benefits in terms of timber and wood as well as no-wood forest products and an array of ecosystem services, not to mention supporting millions of livelihoods across the sub region.

In Angola, more precisely in the northern province of Uíge, NWFPs continue to ensure the survival of thousands of human beings living in poverty, especially those in the out sides of forests and also in peripheral-urban neighborhoods [4, 5]. Authors such as: [6-8] admit that the wild plants play a multiple role in the current life of human populations are used in constructions, traditional medicine. [9] emphasizes that the African is closely linked to the forests which provides him with direct food, materials for building homes or for crafts. Especially in rural areas, the plant itself plays an essential role in the lives of local populations. According to [10], Africa contains of invaluable wealth of natural resources as well as of ancient cultures and their traditional knowledge. [11] reports that in the ancient kingdom of Kongo: “the Bakongo consider nature as a source of vital products whose acquisition requires knowledge and skills”. Despite the increasing number of studies on plant and animal biodiversity in Uíge Province by scientists and the Angolan government in recent decades [4, 12-14] no scientific study has focused entirely on the use of plant and animal organs for the construction of dwellings in rural areas, the manufacture of traditional instruments of music or handicrafts, fishing, packaging and artisanal processing. This reason substantiates the initiation of this investigation in order to document the traditional knowledge for non-food and non-medicinal purposes. Angola is thought to be home, at least 8,000 plant species and 275 mammals [15-17]. Angola reputedly has the second highest number of endemic plants (1,260 species) in Africa [18, 19]. The two country most famous endemics are the prostrate conifer *Welwitschia mirabilis* in southern part of Angola and the giant black sable antelope (*Hippotragus nigervariani*), an endemic species from Angola [15, 18]. According to [15] Angola is blessed with an unusually rich biodiversity. Traditional knowledge, transferred from one generation to the next over millennia, remains a primary source of information on the country’s fauna and flora. Visitors to Angola, such as Welwitsch, Gossweiler, Redinha, Exell and others, have paid tribute to the detailed knowledge held by local people of the taxonomic, ecological, medicinal and economic characteristics of the flora of this country. But much of this knowledge remains undocumented and thus is inaccessible to the majority of the country, his people and the world at large.

2. Methodology

2.1. Study Area Description

The study was conducted in the northern region of Angola, Uíge Province with the eponymous capital, located more than 300 km from Luanda, between 5°51' and 8°25' South latitude and 14°36' and 17°06' East longitude and bounded by the provinces of Zaire and Bengo to the West and the Provinces of Bengo, Cuanza-Norte and Malange to the South. The province occupies a territorial are a 64, 022 km^2. Administratively, it has 2,320 villages and settlements allocated in 31 communes and 16 municipalities and has a population of 1,483,118 inhabitants [5], most of this population lives in rural areas and practices subsistence agriculture. The population of the study area is mainly represented by the Bantus of the Bakongo ethnolinguistic group. Uíge Province is characterized by tropical wet and dry or savannah climate, with a rainy and a dry season which could be subclassified into a dry season between from mid-May to mid-September or October, called "*cacimbo*" (S*ivu* or *Mbangala in Kikongo*) and a small dry season between the months of January and February (*Kunde* or *kuluta*). Also the rainy season, lasting from 7 to 8 months depending on the years it is segmented into two sub-stations, sub-station A- that goes from mid-September or October to January, (*Masanza*) and substation B- that goes from February or March to mid-May (*Kintombo*). During the rainy season the annual temperature average is 23°C, the relative humidity of the air is 85-90%. In the dry season the average annual temperature is only 21°C, its relative humidity is only 70-75% [14]. The economy of Uíge province is based essentially on subsistence agriculture, livestock and small-scale trade [4, 20] and harvest.

According to White [21] Uíge province is located in the Guineo-Congolian/Zambezia regional transition zone. Vegetation is characterized by evergreen and semi-deciduous forests, as well as a mosaic of forest-savannah and gallery forest [22-24]. The hydrography of Uíge is one of the richest in Angola, composed of rivers, streams, lagoons and marshy areas. The most emblematic rivers that irrigate the Uíge province are Kuilu Mfuta, Kuango [20], Loge, Lukunga, Luezi and Vamba [4], Buengas, Calambinga, luate, Kuwu, (kuhu), Mbridge, Koge, Kugo, Lulemba, Maba, Hemba, Zaza, Buenga, Luvovo, Lueka, Huemba, Cugo, and Nzadi Luquiche. The relief consists of plains (Loge Valley, for example) and mountainous areas (e.g. Pingano mountain range, Kananga mountain range).

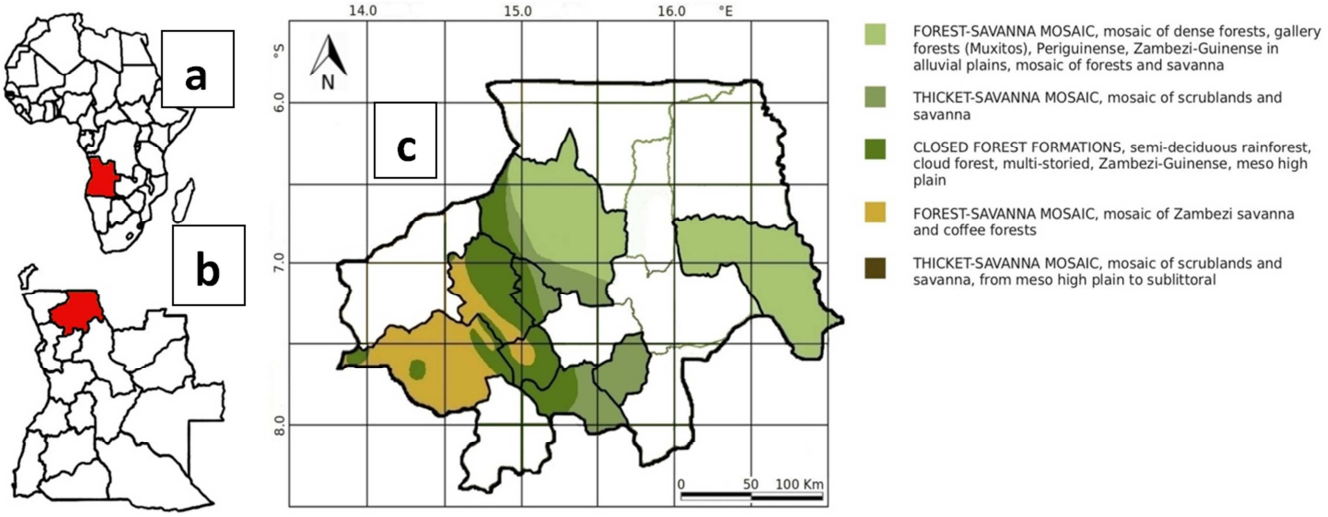

Figure 1. Study area. (a) Angola in Africa (b) Uíge Province in Angola (c) vegetation zones according to [22].

2.2. Study Material

The biological study material consists of sixty-seven species of which sixty-three are of plant origin and three of animal origin, recognized as useful in the socio-cultural or economic activities of communities of Uíge. The identification of species was made from illustrated manuals by [8, 14, 25-28], and also thanks the help of colleagues of the Department of Agronomy of Kimpa Vita University.

2.3. Data Collection

The data were collected from January 2015 to April 2017 using a questionnaire-based survey complemented by observations and interviews with villagers as well as with traditional, religious and administrative entities. The informants were submitted to the following questions:

1. Have you certain knowledge of animals or plants in the region whose organs serve for sociocultural or economic purposes?
2. Can you indicate vernacular names of animals and plants used in the artisan activities as well as their biotopes?
3. What are the organs used?
4. What kind of services do these different forest products agencies offer you?

Thus, the interviews allowed listing the names of plants and animals used in the various practices which contribute to the socio-cultural, economic and emotional well-being of the local population of Uíge. Interviews took place in the 16 municipalities of the province of Uíge whereas in a total 137 people were interviewed, where is the majority were men (78%) and women represent only 22%. Regarding the age, participating women are older than men with an average of respectively 56 and 48 years. Considering the education level, of the 137 people interviewed, 129 (94%) are literate (102 male and 22 female), and 8 (6%) are illiterate, of which six are women and only two are men.

3. Results

3.1. Gender Influence in Artisanal and Domestic Activities

Although globally we live in the era of female emancipation, conservative societies such as in sub-Saharan Africa are still deeply rooted in cultural traditions. Household chores are assigned to family members according to gender, for example, all kitchen activities are reserved for women and girls, as well as sowing and weeding. On the other hand, a huge number of activities are exercised by men. In the Bakongo communities of Uíge Province it is observed that men take care of half of artisanal work (architecture, music and fishing instruments, craft, furniture, lighting, fodder), and only about 15% are reserved for women e.g. collection of vegetable packaging material and food processing. Finally, 36% of the tasks within the household are exercised by both genders: agricultural materials factory, kitchen utensils, hygienic materials and trade in forest products, but with a degree of disproportionate participation.

3.2. Floristic and Faunal Inventories of Forest Products Used for Domestic Purposes

The rural communities of Uíge use an enormous biological diversity of forest products serving for architectural construction purposes such as cassava drier (*Saku in Kikongo*), artisanal fish traps, traditional music instruments, etc. From the preliminary inventory carried out in Uíge Province, 69 species could be documented of which 65

species (94%) are of vegetable origin and only three of animal origin (6%). Used flora is composed of 68% dicotyledous and only 32% monocotyledons (Table 1). We found 55 genus of 24 botanic families. The most represented families in terms of species are: *Fabaceae* (8 species), *Poaceae* 7 species *Arecaceae* 6 species, *Malvaceae* 5 species, *Euphorbiaceae*, and *Marantaceae* appear with 4 species each. The other families, *Amaryllidaceae, Annonaceae, Araceae, Apocynaceae, Asteraceae, Burseraceae, Cucurbitaceae, Cyperaceae, Ebenaceae, Hypericaceae, Lamiaceae, Lygodiaceae, Moraceae, Phyllanthaceae, Rubiaceae, Urticaceae, Typhaceae and Verbenaceae* present a number of species less than or equal to three. Regarding the fauna's contribution to handicrafts and domestic activities, organs (skin, ivory and horn) of four animals (*Loxodonta africana, Cephalophus monticola, Tragelaphus spekii, Syncerus caffer caffer,* Table 2) are used in the manufacture of traditional music: drum (*ngoma in kikongo*) and trumpet (*mpungi in kikongo*). Most species of both plants and animals are found in forests (45%), some found in savannas (23%) and others are ubiquitous (32%). In observation, six woody plant species could not be identified to date. Regarding the growth form of species, the trees occupy the major part (45%), followed by herbaceous with 27% and shrubs and sub-bushes plants with 17% while only less than one-tenth of species (11%) are lianas. As for the animal world, horns and ivory represent 60% and only 40% for animal skins. Focusing on the distribution of habitat, the results of the ethnobiological survey revealed that the forest provides about half of products in artisanal and domestic activities (45%) and savannah shelters 23% of species. Finally, about one fourth, (32%) of species being inventoried, is ubiquitous. Looking to the used parts, 67% of the products are made of stems while 26% are made of leaves and 5% of fruits or seeds and just 2% of roots.

Table 1. The vegetables NWFPs list used in tradicional skill for the rural Bakongos communities of Uíge Province.

Family, Species (Scientific and Vernacular names)	Habitat	Biological type	plants organs & substance	Uses
AMARYLLIDACEAE				
Crinum macowanii Baker (Bunduwala)	F & S	Herb	Leaves & bulb	Ichtyotoxic
ANACARDIACEAE				
Lannea antiscorbutica (Hiern) Eng (Nkumbi)	F & S	Tree	Stem	Construction, stall/traditional dryer (Saku or Kianu in kikongo)
Mangifera indica L. (Manga)	F, S & village	Tree	Stem	Domestics googs, cooking ustensils, Traditional extracting of sugar cane juice (Sú kia luinguila), mortar
Pseudospondias microcarpa (A. Rich) Engl. (Mviwa)	F	Tree	Stem	Construction, stall/traditional dryer (Saku or Kianu in kikongo)
ANNONACEAE				
Annona senegalensis subsp. oulitricha Le Thomas (Lomboloka)	S	Tree	Stem	Agricole equipment (hoe, axe, etc,)
Xylopia aethiopica (Dunald) A. Rich (N'sanu/Nkuwa nkuwa)	F	Tree	Stem	Agricole equipment, house Construction, stall/traditional dryer (Saku or Kianu in kikongo)
ARACEAE				
Raphidophora sp (Mazanla ngongo)	F	Liana	Leaves	Food packaging
ARECACEAE				
Elaeis guineensis Jacq. (Bá dia ngazi)	F, S & Village	Tree	Leaves & Foliolates	Domestics goods, capture fish instruments (lobster pot), house construction, hangar, maracas, belt palm-climbing (lukamba), tradicional Grain stores, chikwangeue packaging, fibre for tying chikwangue
Eremospatha haullevilleana De Wild. (Mbamba)	F	Liana	Stem	Domestics goods, mobile home, capture fish instruments, house construction (lobster pot), hangar, maracas, Toothbrush.
Laccosperma secundiflorum (P. Beauv.) Kuntze (Makoko/Nkawu)	F	Liana	Stem	Domestics goods, mobile home, maracas, tradicional Grain stores
Phoenix reclinata Jacq. (Mansongwa)	F	Tree	Foliolates	Hat, domestics goods
Raphia matombe De Wild. (Matombe)	F	Tree	Leaves & Foliolates	Domestics goods, mobile home, house construction, capture fish instruments (lobster pot), cord, maracas.
Sclerosperma mannii H. Wendl. (Mabondo, Mabwa)	F	Shrub	Foliolates	House construction
APOCYNACEAE				
Periploca nigriscens Afzl. (Ntanda ngandu)	F & S	Liana	Stem & roots	Entertainment (Fooball)
ASTERACEAE				
Crassocephalum rubens Juss. Ex Jacq. S. Moore (Bungudi)	S	Herb	Leaves & stem	Forrage
BURSERACEAE				

Family, Species (Scientific and Vernacular names)	Habitat	Biological type	plants organs & substance	Uses
Canarium schweinffurtii Engl. (Mbidi)	F	Tree	Resin	Illumination/Lighting
CANNABACEAE				
Trema orientalis (L.) Blume (Ndia nuni)	F & S	Tree	Stem	House construction
CUCURBITACEAE				
Luffa cylindrica M. Roem. (Nsanu)	F & Village	Liana	Fruits	Vegetable sponge, filter palm wine
CYPERACEAE				
Cyperus papyrus L. (Bu ou Mabu)	S	Herb	Stem	Cord, mobile, straw (Nkwala, Luandu), Fibre for tying chikwangue
EBENACEAE				
Diospyros heterotricha (Welw. Ex Hiern;) F. White (Lufua lua ndombe, munkoki)	F & S	Shrub	Stem & roots	Toothbrush
EUPHORBIACEAE				
Alchornea cordifolia (Schum. & Thonn.) Müll. Arg) (Wunze)	F & S	Shrub	Stem	Agricole instruments (handle of hoe, axe, etc)
Bridelia ferruginea Benth. (Mwindu)	S	Shrub	Stem	House contruction, toothbrush, Traditional extracting of sugar cane juice (Sú kia lunguila), Secador de mandioca
Hymenocardia acida Tul. (Mvete)	F & S	Shrub	Stem	House contruction, stall/traditional dryer (Saku or Kianu in kikongo)
Ricinodendron heudelotii (Bail.) Pierre ex Heckel (Mungela)	F	Tree	Stem	Musics instruments, Cooking ustensils, Pirogue, Coffin.
FABACEAE				
Millettia laurentii De Wild. (Mboti)	S	Tree	Stem	Traditional extracting of sugar cane juice (Sú kia lunguila), mortar
Albizzia ferruginea (Guill. & Perr.) Benth. (Sambambamba)	F & S	Liana	Stem	Cord, House Construction
Entada gigas Fawc. & Rendle (Futi)	S	Shrub	Stem	Musics intruments
Erythrina abyssinica Lam. Ex DC (Mungoma)	F	Tree	Stem	House construction, domestics goods, Agricole equipment (handle of hoe, axe, etc.)
Erythrophleum africanum (Benth.) Harms) (Ngungu)	F & S	Tree	Stem	House construction, domestics goods, Agricole equipment (handle of hoe, axe, etc.), stall/traditional dryer (Saku or Kianu in kikongo), tradicional Grain stores
Inga edulis Mart. (Banana macaco)	F	Tree	Stem	House construction, domestics goods, Agricole equipment (handle of hoe, axe, etc.), Secador de mandioca, celeiro tradicional
Milletia versicolor Welw. Ex Baker (Mbota)	F & S	Tree	Stem	House construction, domestics goods, Agricole equipment (handle of hoe, axe, etc.), Secador de mandioca, celeiro tradicional
Tephrosia vogelii Hook. f. (Bwalu)	F	Herb	Leaves, stem & seeds	Ichtyotoxic, Seeds conservation
HYPERICACEAE				
Harungana madagascariensis Lam. Ex Poir. (Ntunu)	F & S	Tree	Stem	Agricole equipment (handle of hoe, axe, etc.), house construction
LAMIACEAE				
Vitex doniana Sweet. (Mfilu a mfinda)	F	Tree	Stem	Domestics goods (mortar)
LYGODIACEAE				
Lygodium microphyllum (Cav.) R. Br. (Ntele)	F	Liana	Stem	House construction, fish capture instruments
MALVACEAE				
Ceiba pentandra (L.) Gaerth. (Mfuma)	F & Village	Tree	Stem	Pirogue, Coffin, music instruments
Cola acuminata (P. Beauv.) Schott & Endl. (Kázu)	F	Tree	Stem	Traditional extracting of sugar cane juice (Sú kia lunguila)
Sida acuta Burm. f. (Mimvumvu)	Village & S	shrubby	Stem	Domestics goods
Triumfetta cordifolia A. Rich. (Mpunga)	F & S	Shrub	Stem	Cord, House construction, tradicional Grain stores
Urena lobata L. (Kikolokoso)	S & Village	shrub	Stem	Cord, House construction
MARANTACEAE				
Haumania liebrechtsiana (De Wild & T. Durand) J. Léonard (Tete)	F	Herb	Leaves	Food packaging
Marantochloa congensis (K. Schum.) J. Léonard & Mullend. (Mvuyi)	F	Herb	Stem & Leaves	Cord, Food packaging, mobile home (straw)
Megaphrynium macrostrachyum (Benth.) Milne-	F	Herb	Stem &	Cord, Food packaging, House construction

Family, Species (Scientific and Vernacular names)	Habitat	Biological type	plants organs & substance	Uses
Redh. (Mangungu)			Leaves	
Megaphrynium sp (Mafungu/nkaka)	F	Herb	Leaves	Food packaging, House construction
MORACEAE				
Milicia excelsa ((Welw.) C. C. Berg. Nkamba)	F	Herb	Stem	Domestics goods, Cooking ustensils, Pirogue, Mondo drum, Mortar
Ficus exasperta Vahl. (Vovó)	F	Tree	Stem	Mortar (Dibuka)
PHYLLANTHACEAE				
Hymenocardia ulmoides Oliv. (Nsangani)	S	Shrub	Stem	stall/traditional dryer (Saku or Kianu in kikongo), House construction
POACEAE				
Bambusa vulgaris Schrad. Ex. J. C. Wendl. (Tutu dia mputu)	F, S & Village	Herb	Stem	scale, Music instruments (hoe, axe, House construction
Imperata cylindrica (L.) P. Beauv. (Nianga/Nsonia)	S	Herb	Leaves	House construction
Hyparrhenia diplandra (Hack.) Stapf (Kangu/Masinde)	S	Herb	Stem & Leaves	House construction
Melinis minutiflora P. Beauv. (Fwatakala/Malekambwa)	S	Herb	Stem & Leaves	Forrage
Panicum maximum (Nzambalalu)	S	Herb	Stem & Leaves	House construction
Pennisetum purpureum Schumach. (Diadia)	S	Herb	Stem	House construction, Forrage
Saccharum officinarum L. ((mukuku)	S	Herb	Stem & Leaves	Forrage
Setaria megaphylla (Steud.) T. Durand & Schinz. (Makangaya)	F	Herb	Leaves	Forrage
RUBIACEAE				
Coffea canephora Pierre ex A. Froehner (N'ti a kafé)	F, S & Village	Shrub	Stem	Agricole equipment (handle of hoe, axe, etc.)
Hallea stipulosa (DC) Leroy (N'longua)	F	Tree	Stem	Agricole equipment (handle of hoe, axe, etc), House construction, cooking ustensils, Mortar, Traditional extracting of sugar cane juice (Sú kia lunguila), domestics goods
Sarcocephalus pobguinii Hua ex Pobég. (Nzelengue, Lolo kia mfinda)	F	Tree	Stem	Domestics goods (mortar), pirogue
TYPHACEAE				
Typha latifolia L. subsp. capiensis Rohrb. (Kipipa)	S	Herb	Leaves	Food packaging, cord, Straw
URTICACEAE				
Musanga cecropioides R. Br. (Nsenga)	F	Tree	Stem	Coffin, Raft, Pirogue, Music instrument
SPECIES NO IDENTIFIED				
Mbengi	F	Tree	Stem	Pirogue
Miaza miaza	F	Tree	Stem	Traditional extracting of sugar cane juice (Sú kia lunguila)
Musuemba	F	Tree	Stem	Domestics goods
Nlomba	F	Tree	Stem	Pirogue
Nsaka nsaka	S	Shrub	Fruits & seeds	Ichtyotoxic
Nzelenge (lolo kia nzanza)	S	shrubby	Stem	Domestics goods

Table 2. The NWFPs animal list used in the rural Bantus communities of Uíge province.

Family Spicies (Scientific & Kikongo name)	Habitat	Organs used	Uses
Elephantidae			
Loxodonta africana (Nzamba/nzau)	S	Ivory	Music instruments
Bovidae			
Cephalophus monticola (Nsesi)	F	Skin	Music instruments
Tragelaphus spekii (Nkayi)	F & S	Skin, horn	Music instruments, mobile home.
Syncerus caffer caffer (Mpakasa)	S	Horn	Music instruments

3.3. Forest Products Used for Architectural and Factory Purposes of Cassava Drier

In rural areas the houses are rectangular in shape with two ceilings covered with vegetable materials or zinc. In the rural communities of Uíge province the settlement of villages depends on certain factors such as the availability and accessibility of water, agricultural land, building materials and firewood. The choice of building materials in rural areas largely depends on their availability and the aim of works to

be performed. In rural area is difficult to reach, majority of residences is made with plant material (ceilings and walls) because the plant material is available, and is also financially accessible. Houses partially or totally made of plant material exist in all the 16 municipalities of Uíge Province, but its predominance is remarkable in the municipalities of Kimbele, Alto-Cauala, Buengas, Puri, Nsanza Pombo and Makela do Zombo. In these municipalities the soil is sandier than dominated by clay which makes it difficult to manufacture the adobes. Constructions vary according to the wealth and / or socio-economic status of the family. It was observed that the houses of public officials and traditional authorities of local communities show different appearances like a roof with zinc sheets or even houses made of concrete. The plant species used to construct the roof of traditionally build houses in the rural (figure 2: a, b) areas are mainly *Imperata cylindrica, Hyparrhenia diplandra, Sclerosperma mannii, Megaphrynium macrostachyum* and *Raphia* spec. whose shelf life differs from 4 years (*Megaphrynium macrostachyum*), 5 years (*Hyparrhenia diplandra*.), 7 years (*Imperata cylindrica*), 13 years (*Sclerosperma mannii*) to 17 years for leaf lets of *Raphia* spec. Regarding the basic framework of the houses different woods are found: *Hallea stipulosa, Trema orientalis, Eremospatha haullevilleana, Bridelia ferruginea*, *Lannea antiscorbutica, Hymenocardia acida, Raphia* spec*., Elaeis guineensis, Xylopia aethiopica, Pseudospondias microcarpa, Millettia versicolor, Millettia laurentii, Millettia* spec*.,* and *Marantoclhoa spec*. At the choice of construction material (wall, ceiling and household) in rural areas is based on the durability, strength and rigidity of rustic feature and the mechanical paper that will play the woody plant in the construction. Most tasks for construction of houses is attributed to men, women participate in the kitchen, the transport of material and filling walls with clay. Generally during the construction of the house in the rural area the support from relatives, friends, acquaintances, neighbours from the same village or from another village, this is called solidarity. The host family offers drinks, food and music to their guests. To dry cassava after ratting, the rural communities of Uíge extend them "stall" *in Kikongo language, Saku or Kianu*, which is a traditional dryer.

3.4. Forest Products Used in Furniture and Household Utensils

Houses in rural areas are equipped with modest furniture made of natural resources found in the surrounding environment. Beds are made from leaf rhachis of the palm *Raphia spec*. or of sticks of *Bridelia ferruginea*, *Millettia versicolor*, *Millettia laurentii, Erythrophleum africanum*, and *Hymenocardi acida*. Traditional mattresses to sleep on the floor are mainly manufactured from *Cyperus papyrus* steams, rarely from *Raphia spec.* (figure 2: c) or *Elaeis guineensis* leaves. The major part of furniture (chairs, cupboards and tables) is made of the leaf rhachis of *Raphia* spec. or the stem of the rattan species *Eremospatha haullevilleana*. How much, the brooms are made with the stem of *Sida acuta* or leaflets of *Elaeis guineensis* and *Raphia spec*. and rattan palm trees participate Household utensils such as basket, sieve etc. Hard species such as *Milicia excelsa*, *Millettia laurentii* spec serve as forks to support the bed.

3.5. Other Forest Products Used as Kitchen Utensils and for Food Packaging Purposes

Some kitchen utensils are made of baked clay, for example *kinzu*-pans, a sort of pressure cooker, which gives an extraordinary taste to the food and helps to conserve theeat. Sieve and brick respectively called Nsualu and Ngomba (pitcher) *in kikongolanguage* are made of rattan (*Eremospatha haullevilleana* and *Laccosperma secundiflorum*) or *Marantochloa spec*. and Mbangu is made from leaves of *Imperata cylindrica* and stem of *Marantoclhoa sp* or wire of *Raphia spec*. On the other hand, *Milicia excelsa* (*Nkamba*), *Erythrophleum africanum* (*Ngungu*), *Millettia versicolor* (*Mbota*), *Millettia laurentii (Mboti)*, *Millettia* spec., and *Hallea stipulosa* (*Nlongua*), are used in the manufacture of mortar, pestle, *mwiku a luku* (mexão in portugues), *nzalu* (ladle), *zalu* (spoon and dippers).

Different plant species are used for the protection of food products consumed by the rural communities of Uíge as cassava bread (*kwanga* in kikongo language) "figure 2: i", corn cake (Kende dia *mbika in kikongo language*), or peanut butter (*kende dia nguba in kikongo language*). These products are packed with plant material collected in the forest, such as the leaves of *Marantaceae f*amily and *Raphidophora spec*. (*Araceae*) or leaflets of *Elaeis guineensis* (*ntolola in kikongo language*). In turn, leaves of *Imperata cylindrical* and *Raphia* spp. and stems of *Cyperus papyrus* as well as fibers of *Triumfetta cordifolia* and *Urena lobata* serve to packaging of different food products mentioned above.

3.6. Forest Products Used in Artisanal Food Processing and for Traditional Barn Manufacturing

Certain foods such as maize and cassava that constitute the basic diet in Uíge province need to be processed before storage or consumption. The main woody plants involved in the manufacture of cassava mortar and pestle or Traditional extracting of sugar cane juice (*Sú kia Lunguila in Kikongo*) are *Milicia excelsa, Erythrophleum africanum, Millettia versicolor, Milletia laurentii*, *Millettia spec*., and *Hallea stipulosa*. The latter is important utensil for the production of

wine made of sugar cane (*lunguila in Kikongo language*). A significant number of habitants of Uíge appreciate the various alcoholic beverages, both imported and traditional, sold in the province. The *lunguila* is made of sugar cane juice fermented and flavoured with corn or bark of different plants (*Ngungu)*.

Traditionally, farmers in Uíge have the custom of dividing their agricultural production into three or four parts. One part for self-consumption, one part is sold to help the family to acquire products of first necessity (salt, oil, clothing, medicine, school supplies, etc.), the third part serves as a gift to the church as well as to relatives, and the last part is reserved for the future sowing season. This last part is conserved in traditional barns, locally called *kimpuka (*figure 2: g*), ikumbu*, *kikumbu* or *tula* which are made of plant material. The peanuts are enveloped by leaves of *Imperata cylindrica* and put into another structure scaffold made of *Elaeis guineensis* leaves and the rattan species *Eremospatha haullevilleana* and *Laccosperma secundiflorum*. So fix it fibers of *Triumfetta cordifolia* are tied around. The whole structure is mounted on the top of a stem of *Bambusa vulgaris* and several rustic trees. Usually the barn "*kimpuka*" is suspended in the air outside a stake solid or a rectangular shape (*ikumbu*) and is located opposite or behind the house.

3.7. Forest Products Used for Boats and Artisanal Fishing

Pirogues traditionally were manufactured out of the trunk of three tree species: *Ricinodendron heudelotii* subsp. *africanum*, *Ceiba pentandra*, and *Musanga cecropioides*. But scarcely any drum out canoes is being constructed these days due to the manifold cheap transportation alternatives. For artisanal fishing, different types of fish traps (figure 2: h) are produced (*vuwa, Sulu, Senze, N'sua* or *tubu* in kikongo). All are made of rattan (*Eremospatha haullevilleana*) and palms (*Laccosperma secundiflorum, Raphia* spec., *Elaeis guineensis*), or ferns (*Lygodium microphyllum*). In addition, Bakongo in Uíge, especially women, do use some ichthyotoxic plants to catch fish, such as *Tephrosia vogelii* and *Crinum macowanii*. Finally, *Tephrosia vogelii* is also used as bio-insecticide and therefore particularly suitable for seed conservation.

3.8. Forest Products Used for Lighting, Hygiene Purposes, Musical Instrument Factory and Coffin

Caused by the long during war in Angola the availability of oil was very limited. In the event of a shortage of oil, rural people started to use their traditional plant substitutes. Palm oil (*Elaeis guineensis*) as well as the resin of *Canarium schweinfurthii* was used as lighting fuel. Despite the end of the armed war in Angola, there are still some isolated areas where traditional candles (*loko or Fwabidi in kikongo*) are used for illumination at night. Regarding the forest products used for dental hygiene are, several species are used: the stem of *Diospyros heterotricha*, *Bridelia ferruginea*, *Eremospatha haullevilleana* or *Mondia whitei (*figure 2: g*)*. The dried fruit of *Luffa cylindrica* is commonly used as a vegetal sponge.

Since ancient times, the Bantu people particularly Bakongos rural communities living in Uíge province, still have a habit of using music in different traditional ceremonies, moments of happiness (birth, marriage, New Year's Eve party, installation of the traditional chief, etc.) as well as in moments of unhappiness (death). Traditional music instruments have been widely used in past times for entertainment and communication media, but with the arrival of modernity, most of these instruments have lost their fame and have been gradually replaced by radio and modern musical instruments. Mondo is a traditional musical instrument made of hollow trunk on the basis of *Milicia excelsa*, which is used to transmit funeral, wedding, and other information. The drum (*ngoma in Kikongo language*), is even more used in the churches and traditional music groups and is made of the wooden trunk of *Ricinodendron heudeloti subsp. africanum*, or *Ceiba pentandra*. The vibrant upper part of the tam tam (drum) is covered with animal skin, mainly from *Tragelaphus sperkii* and *Cephalophus monticola*. The ivory of *Loxodonta africana* and the horn of *Syncerus caffer caffer* and *Tragelaphus spekii* serve for the manufacture of *mpungi*, a traditional trumpet. In addition, the stem of *Bambusa vulgaris* is used for "flute" factory. Currently it is only the older people who still have the nostalgia for music played by the traditional instruments. In rural areas, plants used for the manufacturing of coffin and guitar are the same as those used for drums. To produce rattles, which are traditionally used in churches, for funerals or for consolation of children, the leaves of palms and reeds are used.

3.9. Forest Products Used for Cultural Purposes

Bakongo people involve a series of plants in different cultural activities. For example, branches of *Elaeis guineensis* is play a primordial cultural role because they are used for hangar manufacturing, both in moments of happiness like marriages or religious festivals and in moments of unhappiness like funerals.

Table 3. Lists handicrafts, domestic and amusement products sold in the rural markets of Uíge province and its commercial value.

Artisan and domestic products	Unity	Average price (AOKz)	Average price (USD)
Mortar (Dibuka)	1	1850	11.21
Straw (Nkwala/Luandu / Esteira de *Cyperus papyrus)*	1	250	1.51
Rottan (Rotins)	1	100	0.61
Leaves (Folhas de *marantaceae)*	30-40	10	0.06
Basket (Ngiendi/Cesto)	1	1250	7.57
Mobile home (Mobiliários /cadeiras e mesa)	1	4000	24.23
Broom (Sesa/Vassoura de *Elaeis)*	1	125	0.76
Tom-tom (Batuque)	1	7500	45.43
Average global price		1555.63	9.42

3.10. Main Non-timber Forest Products Marketed in the Rural Markets of Uíge

The sale of NWFPs contributes to the income of rural households and therefore also the improvement of human well-being (purchase of school supplies, medicines, clothes, petroleum, salt) or by cigarettes and alcoholic beverages or even money goes to funeral parties and ceremonies. Table 3 lists handicrafts, domestic and amusement products sold in the rural markets of Uíge Province and its commercial value. Analyzing table 3 above, it can be observed that the instrument drum is the most expensive of all (USD 45.43) followed by furnitures (USD 24.23), pestle (USD 11.21), basket (USD 7.57), *Papyrus* mat (USD 3.03), a package of rattan (USD 0.61), *Elaeis guineensis* leaf broom (USD 0.76) and *Marantaceae* leaves (USD 0.06). The prices mentioned above vary from municipality to municipality, from village to village, from seller to seller. According to [29] the majority of the NWFPs (87%) are not marketed. Only about one species over ten are marketed in rural markets. Men and women participate in the sale of NWFPs, but with a predominance of women.

Figure 2. Photographs of some NWFPs used in the Uíge Province. a: Vegetable home wall, b: House in the raw brickcs with vegetable tile, c: Deckchair and mobile home of *Raphia* spec., d: A basket, e: Mortar and pestle, f: Kwanga pakaging with *Marataceae* leaves, g: Tradicional Grain stores and toothbrush, h: Fishes trap (Senze & Vuwa), i: Drum/tam tam (Ngoma).

4. Discussion

In many traditional communities around the world and thus Bakongo people native of Uíge Province in particular have in valuable traditional techniques that are useful in sustaining human life and that are transmitted orally from one generation to another over the years. The foundation of a new village is not by chance, but depends on several factors, such as availability and accessibility of water, agricultural land, building materials and fuels, which has been proven by studies of [30]. Processing techniques to use the richness of natural resources are passed down from generation to generation.

The flora and fauna of the Uíge province are one of the richest and most diversified in Angola. The results of this study reveal a strong woody and herbaceous floriculture composed of 51 genera and 64 species grouped together in 23 botanical families. Among the families identified were *Fabaceae* (7 species), *Arecaceae* and *Poaceae* each with 6 species, *Malvaceae* with 5 species and finally *Anacardiaceae*, *Euphorbiaceae* and *Marantaceae* with 4 species each. The remaining 16 botanical families have a number of species equal to or less than three. This biodiversity is composed of trees (45%), herbaceous (21%), shrubs and sub-bushes (24%), and lianas with 9%.

The 67 species used in artisanal and domestics Uíge, the *Raphia* palm is the only most versatile species of all, why it serves almost or no, all activities, building, furnishings, household items: doors, windows, beds, table, chairs, Cabinets, broom, basket, *kwanga (chikwangue)* binding yarn, leaves and leaflets for roofing, etc. The above results on abundance of botanical families corroborate with the [6] in the DRC that 22 families have been inventoried and the most representative are *Euphorbiaceae*, *Arecaceae, Rubiaceae, Marantaceae*, etc. In Altamira, Brazil, [31], show that *Arecaceae* and *Fabaceae* were the most abundant families used in handicrafts. The selection of artisanal and domestic material by the rural communities of Uíge Province depends on the type and work is intended. For example, for construction and food processing they are based on the Physical availability of the material in the area where it will be erected and the quality of the works to be performed, durability, strength and stiffness of plants. On the other hand, plants such as *Ricinodendron heudelotii* subsp. *africanum, Ceiba pentandra* etc, are light, legean, flexible and easy to be worked by the craftsman and used in the factory. Cooking utensils: *Mwiku a luku* (mexão in portugues), N*zalu* (ladle), *Zalu* (spoon and dippers), *Pidi* (dish) and instruments of traditional music by examples guitar, tam tam (drum) and coffins. Authors such as [32-37] corroborate with the Results found in this study on the use of *Ricinodendron heudelotii* subsp. *africanum*. On the other hand, heavy plants and hard as *Milicia excelsa*, pestle and mortar. Meters like mexão, ladle, spoon dippers are also manufactured with heavy and hard trees. [38] in shrimps showed that Used for architectural purposes and domestic use (pestle and mortar) are heavy, hard and of good quality and durability, resistant to termites and xylophagous insects. The study also revealed that the use of in the vessel, such *Milicia excelsa*, *Ricinodendron heudelotii* subsp. *africanum*, *Ceiba pentandra* and *Musenga cecropioides*. According to [39] *Ceiba pentandra* is used in Kwanza Norte, Santo Antonio do Zaire and Cacongo, for the manufacture of canoes or boats. The study also revealed that, during the construction of houses in rural areas, most tasks are attributed Men and women participate in the preparation of food, the transport of materials and sometimes in the filling walls with clay. Generally, during the construction of houses in rural areas, the Support of relatives, friends, acquaintances, neighbourhoods of the same village or other village, this is called Solidarity. These observations corroborate a study by [10] in Côte d'Ivoire, Building is carried out collectively, and this reinforces social cohesion and learning and acquisition by the different know-how in construction. About half (48%) of the plants used in domestic activities by the rural communities of Uíge are the Forest areas and 27% comes from the savannah. Finally, 25% of inventoried species are ubiquitous. The most used plant organs are stem and bulb with 73% and leaves and leaflets occupy 21% fruits and seeds represent 4% and roots occupy only 1%. The animal world makes little Activities in Uíge Province. The horns of *Tragelaphus sperkii and Syncerus caffer caffer* and ivory of *Loxodonta* the traditional trumpet and the skins of *Tragelaphus sperki* and *Cephalophus monticola* on the top of the vibrant drum top. [40] states that the skin of certain animals as the deer serves in the making of drums In six of the sixteen municipalities in the Uíge province, the results obtained in this study revealed a notable predominance of houses in plant material. There are several reasons that may be the origin of these facts, poor access roads, lack of diversification of their sources of income, soil that is more sandy than clay and the poverty that plagues rural farmers. According to the World Bank [41], the majority (75%) of the world's poor live in rural areas. The highest poverty rate in the rural areas (29%) and in urban areas (13%). In sub-Saharan Africa, 51 percent of the poor live in rural areas. According to [42], African rural populations are not only lacking in income but lacking the need survival. [6] conducted an ethnobotanical study of wild plants used for handicraft purposes by Pygmies "Mbuti" from the Ituri Forest (DRC) and 43 forest species were identified various craft uses. Among the 43 species inventoried by these authors, of the species used in the construction of wood peckers, only two species (*Sclerosperma manii* and *Megaphrynium macrostachyum*)

were found in Uíge and three other species: *Marantochloa sp*, *Sclerosperma manii* and *Canarium schweinfurthii* are also used for the same purposes in Uíge. In addition, no species of plants serving Laser or fun is similar. As for [43] in the same country had repertoire 32 species of diverse use plants, 11 used as construction materials, 8 species in the packaging of products, (6 species), of natural jewels (4 species), 2 species of Furniture. A study by [44] in the Republic of Congo lists the forest products of technical uses: Sheets used for packaging purposes are: *Megaphrynium spp, Sarcophrynium sp* and *Marantochloa Sp*, *Cyrtosperma senegalensis*; Building materials: *Eremospatha haullevilleana, Laccosperma secundiflorum* and *Raphia spp*. [40]: at the level of artisanal use, NWFPs serve in the handicrafts, goods of daily use: bags, furniture, baskets, mats, food packaging and on this use, certain animals such as deer, whose skin is used in the manufacture of non-food and Building houses (leaves of *Marantaceae*, and leaves and leaflets of palm trees *Raphia*). Finally, the results of ethnobiological survey revealed that in the rural communities of the indigenous Bakongos of Uíge, they use several NWFPs of both animal and plant origin in their socio-cultural life and contribute to sustaining life and significant participation in animal feed, house building, traditional music and furniture etc. These results corroborate several other studies [3, 8, 26, 45, 46] that show that NWFPs constitute a source material for shelters, household equipment, fodder, etc. The study also revealed the use of certain plants as *Tephrosia vogelii* is used as ictiotoxico and preservative of food crops, insecticide. Bossard [47], shows that *T. vogelii* (*in umbundu, lembe*) is used as it is found in Angola and in much of southern Africa, it is used as ichthyotoxic and insecticide. According to Latham [26], in southern Tanzania the leaves of *Tephrosia vogelii* are used as ichthyotoxic and conservative food crops. [7] in the province of Kongo Centrale (DRC) cite *Tephrosia* as an Ichthyotoxic plant. In the event of a lack of lighting oil (kerosene) of houses, in the rural communities of the Sometimes palm oil is used instead of oil or traditional candle (*Loko/Fuabidi*) made of *Canarium schweinffurtii* resin According to [39], in Angola the resin of *Canarium schweinffurtii m*anufacture of torch for lighting. The few NWFPs marketed in the rural markets of Uíge reinforce the villagers' portfolio and Generation of income and improvement of human well-being, because the recued money will participate in the purchase (Liquefied petroleum, salt, fish etc.), school supplies for children, medicines, clothing etc. As for FAO [3], NWFPs are an additional source of income and enable the diversification of income and acquisition of basic goods and services to rural households. [47] emphasizes that the sale of NWFPs (rattles and lianas) contribute effectively to household income and enable these households to families to support their children's schooling, health and daily food. For his part, [31, 48] emphasize that the use of handicrafts is a complement to income. Lastly, the study showed the Uíge Bantu also use the clay in the pitcher factory (container of water) and cooking pots. [26] shows that in southern Tanzania the clay is used to make domestic utensils such as earthen ware, pitcher.

5. Conclusion

The present investigation has made it possible to highlight the great place of traditional know-how in the life of rural communities of Uíge. Given the abundance of traditional techniques and the biodiversity of used for handicrafts and domestic purposes in rural areas in Uíge deserve more than their development and dissemination. The study showed that the Bakongos communities of Uíge know and use a wide range of NWFPs with multiple uses whose the animals. The study also revealed the main reasons for the dependence of villagers on forest resources are poverty, the poor state of access roads and the inaccessible prices of modern building materials, etc. Forestry products are actively involved in the manufacture of furniture, household appliances, traditional music, packaging and traditional food processing, etc. Finally, they contribute to the improvement of family income and acquisition of services and goods of first necessity. Given the irreplaceable role of the forests in the rural communities of the Bakongos of the Uíge requires a rational exploration of these natural for human well-being and the environment. We suggest the continuity of this study to obtain more data globally.

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