

Forest Products Of Ehor Forest Reserve In Uhunmwode Local Government Area, Edo State

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ABSTRACT: Timber and non-timber forest products of Ehor Forest Reserve in Uhunmwode Local Government Area of Edo state, Nigeria was evaluated in this study. A total of 257 uses were identified, distributed into sixteen groups according to their ethnobotanical uses. Many of them had multipurpose uses. Medicinal plants accounted for the highest number of species 62 (24.90%) which explains the importance the rural dwellers place on herbal treatment. This was followed by timber plants with 54 species (22.10%), food producing plants/vegetables 26 species (10.44%) and chewing sticks 18 (7.23%). All merchantable timber species within the various compartments had been harvested leaving the reserve with only wildlings. A number of food and timber trees as well as plants which provide fuel wood were under threat of extinction because of over exploitation. Since a significant proportion of the Edo state economy is derived from the forest products, harvesting of the forest products should be carried out sustainably in order to conserve them for future use. [Researcher. 2009; 1(4):83-91]. (ISSN: 1553-9865).

Key words: Forest products, Timber, Non-timber forest products, Medicinal plants.

INTRODUCTION

The forest is a haven of diverse renewable natural resources. The British Commonwealth Forest Terminology defined forest products as “all materials obtained from a forest estate including earth, stone, gravel and sometimes minerals. It is classified as major which usually are timber, small wood and firewood; and minor such as all forest products other than the major forest products including grasses, fruits, leaves, bark, exudates, animal products, soil and sometimes minerals” (Okoro, 2002).

Isichei (1995) classified timber as the main forest product while others are considered as minor. Cunningham *et al.* (2005) is of the view that since firewood accounts for about half of all wood harvested worldwide on which a third of the people of the world depend as their principal source of fuel, it should be grouped with timber as a major product while other forest products are minor. Research into the exploitation of non-timber forest products has shown that their exploitation is competing fast with that of timber hence what is major and minor is subjective.

Forest products in various forms like medicines, food plants, materials for household items, fuel wood, plant yielding dyes, resins, fibres, alcoholic drinks, toxins and gum, chewing sticks for oral hygiene and fodder plants are the generally accepted minor forest products and these occur in greater variety in the forest than the timber. According to Osemeobo and Ujor (1999) they also have shorter frequency of harvest cycle, smaller yield per unit area in the forest and higher monetary value per unit weight.

Forest products form a significant natural resource component of the poor people particularly in the rural areas. Edo state in particular is regarded as rich in forest resources. Wood based industries hold second place in the provision of employment opportunities with about 14% of the total employees in the state engaged in it. Other industries generating employment from forest products are: traditional craft industries like carving, cane work, raffia work, fuel wood gathering and sale, charcoal production, mortar and pestle products, sponge production and sale, chewing sticks production, mat weaving industry, canoe carving, broom making, tooth picks, pencil and slate production, bee keeping/ honey production (Azeke, 2002).

In view of the significant role played by forest products in the economy of Edo state, the focus of this paper is to take inventory of the floral forest product in Ehor Forest Reserve, Uhunmwode Local Government Area of Edo state, Nigeria.

MATERIALS AND METHODS

STUDY SITE:

Ehor Forest Reserve occupies an area of 7,680 hectares in Uhumwode Local Government Area of Edo state, Nigeria. It is located between latitudes 6° 34'N and 6° 38'N and longitudes 5° 54'E and 5° 58'E fifty-six kilometers north of the state capital, Benin-City. It is divided into forty-eight compartments of 160 hectares each. Farming is commonly practiced within the reserve which is situated in the lowland rainforest zone. Though there are no settlements within the reserve, it is surrounded by nine villages viz: Ohe, Eguaholor, Egbisi, Ugieghudu, Uhi, Iriwe, Erhue, Evbowe and Ekudo. It had a sizeable number of timber species which made it attractive to logging companies. Cassava is the most commonly encountered crop in the reserve. Apart from timber, other non-timber forest products like fuelwood, chewing sticks, medicinal plants, construction and weaving materials, vegetable and other food materials are also exploited from the reserve.

SURVEY METHOD

Three compartments of 160 hectares each were sampled for timber and non-timber products. The compartments sampled are 81 on the western end, 95 centrally located and 112 at the eastern end. This is to have an adequate representation of the whole forest reserve. Sampling was done by laying out sample plots of 30 × 30 metres in each of the compartments studied according to the method of Inegbedion 2008. Inventory was taken of all the timber and non-timber plants within the compartments. Information on their utilization was provided by the three local plant enumerators recruited for such purpose and by reference to Gill (1992), Osemeobo and Ujor (1999), Aiyeloja and Ajewole (2006).

RESULTS

A list of the forest products and their ethnobotanical uses are presented in Table 1. They are classified into the underlisted sixteen groups based on their uses: 3 species of food wrappers (1.2%), 55 species of timber (22.10%), 2 species of fibre producing plant (0.80%), 6 species of dye plant (2.41%), 5 species of fodder plant (2.01%), 26 species of food plant (10.44%), 4 species of toxin producing plants (1.61%), 51 species of fuel wood (20.48%), 18 species of chewing stick (7.23%), 9 species of plants used in producing household items (3.61%), 62 species of medicinal plants (24.90%), 1 species of plant used for cultural rites (0.40%), 6 species of gum producing plants (2.41%), 3 species of latex producing plants (1.20%), 5 species of plants used in charcoal production (2.01%), 5 species of plants for house construction and agricultural implements (2.01%).

A number of them have multiple uses, for example *Azela africana* can be used as timber, the leaves serve as fodder and vegetables; the stem and branches as fuelwood and charcoal production while its twig is used as chewing stick. *Albizia zygia* is another important forest product used as timber, fodder, food, fuel wood, chewing stick and its exudates can be used as gum.

Elais guineensis produces fibre, palm oil for cooking, kernel oil for cosmetics, household items like brooms, beverages like palm wine which is also used for medicinal purposes and it is an important component of items used in traditional ceremonies while the rachis from the palm frond is used for house construction in the villages.

Table 1: Timber and non- timber forest products in Ehor Forest Reserve and their uses.

S/N	Plant Species	Food Wrapper	Timber	Fibre	Dye	Fodder	Food	Toxin	Fuel Wood	Chewing stick	Household Item	Medicinal	Cultural rites	Gum	Latex	Charcoal	Agric & Constr
1	<i>Afzelia africana</i>		√			√	√		√	√						√	
2	<i>Aframomium melegueta</i>						√					√					
3	<i>Agaricus species</i>						√										
4	<i>Albizia ferruginea</i>		√					√				√					
5	<i>Albizia lebbeck</i>		√		√							√					
6	<i>Albizia zygia</i>		√			√	√		√	√				√			
7	<i>Allanblackia floribunda</i>		√							√		√					
8	<i>Alstonia boonei</i>	√	√						√			√					
9	<i>Amphimas pterocarpoides</i>																
10	<i>Angylocalyx zenkeri</i>																
11	<i>Anonidium mannii</i>				√				√			√					
12	<i>Anopyxis klianeana</i>																
13	<i>Anthonotha macrophylla</i>																
14	<i>Antiaris africana</i>		√						√								
15	<i>Antiaris welwitschii</i>		√									√					
16	<i>Antracaryon micraster</i>						√										
17	<i>Bambusa vilgaris</i>																√
18	<i>Baphia nitida</i>				√		√		√	√		√				√	
19	<i>Berlinia grandiflora</i>		√														
20	<i>Blighia sapida</i>		√				√		√			√					
21	<i>Bombax brevicuspe</i>		√														
22	<i>Bosqueia angolensis</i>		√						√			√					
23	<i>Brachystegia nigerica</i>		√											√			
24	<i>Calamus mannan</i>										√						
25	<i>Calamus calamus</i>										√						
26	<i>Canarium schweinfurthii</i>		√				√		√			√					
27	<i>Carpolobia lutea</i>						√			√							

S/N	Plant Species	Food Wrapper	Timber	Fibre	Dye	Fodder	Food	Toxin	Fuel Wood	Chewing stick	Household Item	Medicinal	Cultural rites	Gum	Latex	Charcoal	Agric & Constr
28	<i>Ceiba pentandra</i>		√	√		√	√		√			√					
29	<i>Celtis mildbraedii</i>																
30	<i>Celtis zenkeri</i>		√						√								
31	<i>Chrysophyllum albidum</i>						√					√					
32	<i>Chrysophyllum delevoyi</i>		√				√					√					
33	<i>Cleistopholis patens</i>		√														
34	<i>Cola acuminata</i>						√					√					
35	<i>Combretodendron macrocarpum</i>		√						√			√					
36	<i>Cordia millenii</i>		√														
37	<i>Costus afer</i>										√	√					
38	<i>Cylicodiscus gabunensis</i>		√						√			√					
39	<i>Dacryodes edulis</i>		√				√		√			√					
40	<i>Daniellia ogea</i>		√						√							√	
41	<i>Desplatsia suberica</i>																
42	<i>Diospyros alboflavescens</i>		√														
43	<i>Diospyros dendo</i>		√							√							
44	<i>Diospyros mesipiliiformis</i>		√			√			√	√		√					√
45	<i>Distemonanthus benthamianus</i>		√						√			√					
46	<i>Elaeis guineensis</i>			√			√				√	√					√
47	<i>Entandrophragma angolense</i>		√					√	√					√			
48	<i>Fagara macrophylla</i>		√						√	√		√		√			
49	<i>Funtumia elastica</i>		√						√			√			√		
50	<i>Garcinia kola</i>									√		√					
51	<i>Gossweilodendron balsamiferum</i>		√						√								
52	<i>Guarea cedrata</i>		√						√								
53	<i>Guibourtia species</i>											√					
54	<i>Hannoa klaineana</i>		√				√		√			√					
55	<i>Hevea brasiliensis</i>								√						√		
56	<i>Homalium aylmeri</i>																
57	<i>Hunteria umbellata</i>											√					

S/N	Plant Species	Food Wrapper	Timber	Fibre	Dye	Fodder	Food	Toxin	Fuel Wood	Chewing stick	Household Item	Medicinal	Cultural rites	Gum	Latex	Charcoal	Agric & Constr
58	<i>Hymenostegia afzelii</i>		√				√			√		√					
59	<i>Irvingia gabonensis</i>		√				√					√					
60	<i>Irvingia grandifolia</i>		√				√										
61	<i>Khaya grandifoliola</i>		√											√			
62	<i>Khaya ivorensis</i>		√														
63	<i>Lannea welwitschii</i>											√					
64	<i>Lentinus tuber-regium</i>						√					√					
65	<i>Lonchocarpus griffonianus</i>																
66	<i>Lophira alata</i>		√									√					
67	<i>Lova trichilioides</i>		√														
68	<i>Maesobotrya bateri</i>																
69	<i>Maesopsis eminii</i>											√					
70	<i>Mansonia altissima</i>		√														
71	<i>Megaphrynium macrostachyum</i>	√					√				√						
72	<i>Memeylon blakeoides</i>									√		√					
73	<i>Millicia excelsa</i>		√									√			√		
74	<i>Musanga cacropioides</i>		√				√		√	√		√					
75	<i>Myrianthus arboreus</i>						√		√	√		√					
76	<i>Nauclea diderrichii</i>		√						√			√				√	
77	<i>Nesogordonia papaverifera</i>		√							√		√					
78	<i>Newbouldia laevis</i>					√						√	√				
79	<i>Okoubaka aubrevillei</i>																
80	<i>Olax subscorpioidea</i>									√		√					
81	<i>Pachyelasma tessmannii</i>		√						√								
82	<i>Pallisota hirsute</i>											√					
83	<i>Panda oleasa</i>																
84	<i>Pausinystalia macroceras</i>								√			√					
85	<i>Pentaclethra macrophylla</i>		√				√		√			√					
86	<i>Pentadesma butyracea</i>											√					
87	<i>Pierreodendron africanum</i>																

S/N	Plant Species	Food Wrapper	Timber	Fibre	Dye	Fodder	Food	Toxin	Fuel Wood	Chewing stick	Household Item	Medicinal	Cultural rites	Gum	Latex	Charcoal	Agric & Constr
88	<i>Piptadeniastrum africanum</i>		√						√			√					
89	<i>Polyalthia suaveolens</i>											√					
90	<i>Polyceratocarpus parviflorus</i>																
91	<i>Pterocarpus osun</i>		√		√				√			√					
92	<i>Pycnanthus angolensis</i>		√									√					
93	<i>Rauwolfia vomitoria</i>							√	√	√		√					
94	<i>Ricinodendron heudelotti</i>		√									√					
95	<i>Rothmania hispida</i>				√				√			√					
96	<i>Spathodea campanulata</i>											√					
97	<i>Staudtia stiptata</i>																
98	<i>Sterculia oblonga</i>		√														
99	<i>Sterculia tragacantha</i>											√		√			
100	<i>Strombosia postulate</i>		√						√	√						√	
101	<i>Tabernaemontana pachysiphon</i>								√			√					
102	<i>Terminalia ivorensis</i>		√						√			√					
103	<i>Tetrorchidium didymostemon</i>											√					
104	<i>Thaumatococcus danielli</i>	√					√				√	√					
105	<i>Trichilia lanata</i>																
106	<i>Trichilia priuriana</i>											√					
107	<i>Triplochiton scleroxylon</i>		√						√								
108	<i>Uvariopsis dioica</i>							1									
109	<i>Xylopia aethiopica</i>						√			√		√					
	Total	3	55	2	6	5	24	4	51	18	9	62	1	6	3	5	3
	Total (%)	1.17	21.40	0.28	2.33	1.95	9.34	1.56	19.84	7.00	3.50	24.12	0.39	2.33	1.17	1.95	1.17

DISCUSSION

The forest products reported here were among those earlier reported by Gill and Okoegwale (1991) and Osemeobo and Ujor (1999) to occur in the Nigerian forests. From the forests of Osun State, Nigeria. Aiyeloja and Ajewole (2006) reported *Garcinia kola*, *Aframomium melagueta*, *Agaricus* species, *Irvingia gabonensis*, *Baphia nitida*, *Thaumatococcus danielli*, *Cola nitida*, *Megaphrynium macrostachyum*, *Alstonia boonei*, *Rauwolfia vomitoria*, *Pycnanthus angolensis*, *Milicia excelsa* and *Newboldia laevis*. All these species in addition to others were also encountered at the Ehor Forest Reserve.

Some timber and food plants like *Cordia millenii*, *Dacryodes edulis*, *Garcinia kola*, *Irvingia gabonensis*, *Khaya grandifoliola*, *Nauclea diderichii*, *Rauwolfia vomitoria*, *Terminalia ivorensis* and *Xylopiya aethiopica* were represented by only one stand. This indicated that they have been overexploited and may go into extinction from the forest reserve if adequate measures are not taken to conserve them. Unsustainable harvesting of these products play a great role in their depletion from the forest. According to Osemeobo and Ujor (1999) poor harvesting of plants lead to: reduction in fruiting patterns and in quantity of fruits and surface area of crowns resulting in decreased photosynthesis thereby causing a die-back in plants and finally death of some plants harvested in the dry season due to water stress and bush burning.

The non-timber forest product sector is growing very rapidly, perhaps faster than the timber industry and it is expected to grow more in future not only in Nigeria but worldwide. *Manilkara zapota* is a non-timber forest species found in most of the surviving forests in Central America, producing latex which is a source of chicle used in chewing gum (Kellman and Tackaberry, 1997). Latex producing trees like *Hevea brasiliensis*, *Funtumia elastica* and *Milicia excelsa* recorded in this study could be screened for such purposes. These same plants could also be screened to be utilized as either diesel fuel or high quality liquid fuel which will serve as an alternative source of energy for running our vehicles or for domestic use. According to Shukla and Chandel (2008) a large number of species of Euphorbiaceae to which *Hevea brasiliensis* belongs secrete latex containing about 30% hydrocarbon and may serve as important source of hydrocarbon.

Forest medicines are very popular with rural dwellers particularly in Edo state; hence the State has a board for the control of traditional medicine practices. Plant medicines are generally the first recourse for rural households. When this fails, they either turn to traditional healers or western-type medicines (Azeke 2002). Most of the forests in Edo State are very rich in medicinal plants. This explains why the highest number of species put in figures used as medicinal plants were more than other ethnobotanical uses. Generally, a large number of forest plants have medicinal value hence Abu and Adebisi (2002) regarded the forest as the richest drugstore.

Most of the timber species encountered were wildlings because this reserve had been stripped of merchantable trees by logging companies exploiting the forest reserve. Despite that the timber species diversity of the reserve can be said to be reasonable. These timber species and those from other forest reserves provide the raw materials to feed the numerous saw mills in Edo State thereby providing employment for thousands of youths and a significant proportion of those affected by the wave of retrenchments in the public service (Azeke, 2002).

The food plants encountered in this study either produce fruits e.g. *Chrysophyllum albidum*; vegetables-*Myrianthus arboreus*; spices *Xylopiya aethiopica*; mushrooms *Agaricus sp.* Seeds for preparing soup like *Irvingia gabonensis*; oil and alcohol beverage *Elaeis guineensis*. Osemeobo and Ujor (1999) classified food plants into seven groups based on what they produce.

Different parts of the eighteen species of plants identified in this study used for chewing sticks, are useful. For some like *Fagara macrophylla* and *Garcinia Kola*, the roots are used while for others like *Carpolobia lutea*, *Olax subscorpioidea*, *Hymenostegia afzelii* and *Nesogordonia papaverifera*, the twigs are used (Gills, 1992).

Fifty-one species of fuelwood and five species of plant used for charcoal production were identified. Fuel wood is one of the most important product of the forest because the majority of the rural dwellers depend on it for their energy source particularly for cooking. According to Cunningham (2005), it accounts for almost half of all wood harvested world wide and it is the main source of energy for one third of the human race. As a result of the pressure on the traditional fuelwood species, some of the well known timber species are also used either as fuel wood or for charcoal production e.g *Afzelia africana*, *Daniellia ogea*, *Nauclea diderrichii* and *Strombosia postulata*. *Thaumatococcus danielli* was one of the food wrappers found in Ehor Forest Reserve producing little berries at its base which contain proteinaceous sweeteners. These berries are believed to hold man's key to alternative sweeteners particularly for diabetic patient (Isichei, 1995). Other food wrappers in the reserve were leaves of *Alstonia boonei* and *Megaphrynium macrostachyum*.

The stalk of *T.danielli* and *M.macrostachyum* and the stem of *Calamus calamus*, *C.mannan*, *Costus afer* and the frond of *Elaeis guineensis* are used in the production of household items like native trays, cane furniture, baskets, brooms e.t.c.

The dye plants in the reserve produce dye from the leaves e.g *Pterocarpus osun* and *Ruthmania hispida* while *Baphia nitida* produces it from the bark. The dye is extracted and used to decorate the body during traditional ceremonies in the villages. It is also used to dye textile on a small scale.

Other uses to which the forest product can be employed include house construction with the rachis of *Elaeis guineensis* and *Bambusa vilgaris*; fibre production from the fruit of *Elaeis guineensis* and *Ceiba pentandra*; fodder from the leaves of *Azelia africana*, *Albizia zygia*; *C.pentandra*, *Diospyros Mesipiliformis* and *Newboldia laevis*. The latter is also used for cultural rites.

Of the twenty-seven gum producing plants enumerated by Soladoye (1977) to occur in the Nigerian forests, six were encountered in Ehor Forest Reserve. These were *Albizia zygia*, *Fagara macrophylla*, *Entandrophragma angolense*, *Brachystegia nigerica*, *Khaya grandifoliola* and *Sterculia tragacantha*. He also found that these plants produced gum in abundance which could be harnessed for export to earn foreign exchange for the country.

Albizia ferruginea, *Entandrophragma angolense* and *Rauwolfia vomitoria* produced toxins used for fishing.

Diospyros mesipiliformis is used for the construction of agricultural and household implements like hoe handle, pestle and mortar while the rachis of *Elaeis guineensis* and *Banabusia vilgaris* stems are used as poles for house construction in the villages.

The surrounding villages of Ehor Forest Reserve depend on these enumerated plant species for their livelihood and provide additional income by collecting and selling these forest products in the markets. Conservation of these products should be a priority of governments at all levels in Edo State.

CONCLUSION

Attention has been drawn to the variety of forest products available in Ehor Forest Reserve and their uses. These products contribute significantly to the economy of Edo state so they should be exploited with caution to avoid their depletion from the forests.

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