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Utilization of Forest Products in Nigeria

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ABSTRACT: The paper focused on forest resources and their utilization in Nigeria, Forestry is the systematic management and use of forests and their natural resources for human benefit. Nigeria is faced with food crisis partly due to the ever increasing human population and declining per capita food production. Forest resources is estimated to be about 9.7% of the total land area of Nigeria. These resources are of great benefit to the rural households because they contribute tremendously to their income and overall, well being especially the non-timber forest products. There resources include some of the major economic trees such as *Triplochiton scleroxylon*, *Cedrela odorata*, *Chlorophora excelsa*. They are used as sawn wood and plywood for building construction, furniture and panelling. They are high valued species that are fast diminishing in availability because of forest destruction and unsuccessful artificial regeneration. Other resources are those utilized by wood based industries and finally wildlife resources. They serve as a source of bush meat and sometime serve medicinal purposes. It is recommended that the federal government should diversify the economy by concentrating on those forest resources as a veritable means of generating revenue internally. Furthermore, attempt should be made to combat deforestation by creating awareness about the importance of these resources keywords: forest resource, forest product, wildlife management, wood based industries.

Key Words: Forest resources; Food production; Economic trees; Wildlife management.

Introduction

Forestry and Agriculture are closely interrelated and often competition occurs between them for land, labour and capital inputs. The role of forest resources in economic development has gained increased attention in the last two decades. Many studies supported by the FAO, IDRC and SIDA covering most of the tropics conclude that forest reserves are particularly important in the tropical economies. Forests provide fuel and building construction for many people in the tropics.

The land and waters of the earth sustain a vast assemblage of plants upon which all other living forms are directly or indirectly dependent. These autotrophes have the remarkable property of capturing the inexhaustible energy of the sun to synthesize organic compounds which are vital for the existence of all life on earth. Organic deposits, such as cone, lignite, peat and petroleum are evidence of the photosynthetic activity of plants in the geological past. In addition, plants stabilize soil, conserve moisture and preserve an equable climate. After violent disturbances of the earth such as volcanic eruptions and upheaval of mountains, plants cover the denuded ground with a carpet which protects the surface from being washed away.

The forest has always provided people with a source of food, shelter and protection from enemies. Forest resources are important for the economic wellbeing of every nation. Although the size and quality of forest resources on most countries of the world have been reduced, their potential is now being recognized.

THE ROLE OF FORESTRY

Energy – Giving Foods and Flavourings

The 3 daily meals consist either of plant products such as cereals, vegetables and fruits or products of animals (meat, cheese, butter, milk, and eggs) that have been fed on plants.

The direct food value of lower plants is small although man uses in his diet a number of mushrooms, morels and puffballs. On the whole, vegetables and fleshy fruits contain comparatively little stored food but are of considerable significance as they provide us with vitamins and mineral salts that are essential for the maintenance of health. Beri-beri, scurvy and pellagra are among the diseases caused by vitamin deficiency resulting from lack of vitamin B, (thiamine), vitamin C and niacin respectively.

Plants and the Home

Prehistoric man used many different kinds of plants for constructing his means of transport and dwellings, such as wattle, and daub nuts and the more elaborate Swiss lake dwelling built on piles along the borders of lakes. Even today, wood is still employed as a source of structural support, as a principal construction material for housing and transportation, and as raw materials for the manufacture of paper, rayon, plastics, explosives, lacquers, cellophane and photographic films. The fuel that warms our homes and the energy which operates most of our industry comes directly or indirectly from plants. The paper industry depends largely upon wood pulp. Thus, plants are the carriers of written words, ideas and information and have been referred to as the medium of thought.

Plant Fibres and Fabrics

From the earliest times, man has used fabrics of many kinds for protection, worth, personal adornment and even to display personal wealth. Even today, fabrics are being used for these purposes. Besides, clothing, plant fibres are used in the manufacture of rope and string, brushes and brooms, paper and paper products, upholstery work (filling mattresses, cushions etc) and life belts. Fibres of commercial importance, however, are relatively few, the most important of which are: cotton and kapot (surface fibres) flax, jute, hemp, roselle and ramie (soft fibres) abaca and sisal (hard fibres). Cotton is still the world's most important natural fibre.

Plants and Health

Primitive people, the world over, have always used man different kinds of plants are cure for various ailments. Quinine obtained from the bark of several species of cinchona has long been used as an anti-malaria drug. The leaves of European foxglove (*Digitalis purpureal*) provide digitalis – a valuable heart stimulant. Opium and its derivatives, obtained from *Papaver somniferum*, are used to relieve pain and induce sleep.

Numerous other drugs of plants origin have been found to be useful in the treatment of various disorders. Among these are rauwolfia, belladonna, nux-vomica, ephedrine, ergot, aconite, podophyllum, ginseng, cascava and curcuma.

Man also uses a number of vegetable products for their stimulating and narcotic effect. These include opium, and its derivatives, marijuana, coca, betel nut, coca and tobacco of which the first two especially are habit-forming things.

The Practice of Forestry

Forestry – loosely defined as the systematic management and use of forests and their natural resources for human benefit – has been practiced for centuries. Most often, forestry efforts have been initiated in response to indiscriminate timber cutting that denuded the land and caused erosion, floods or a shortage of food products.

Ancient Forestry Practices

In ancient times forest protection and nature conservation laws were in effect as early as 1,700 BC. In the African Tropics, agroforestry (growing of food crops in association with trees) has been practiced for hundreds of years.

Relatively little is known about tropical forestry before the mid 1800's in most places. At that time, the European colonial empires – brought modern forest management practices to African and other countries. Centres for forestry and forestry research were established and more careful records are kept.

Sustainable Forestry

Modern forestry has its basis in 18th century. Forestry is essentially agricultural. Trees are managed as a crop. Two concepts are important. Renewability and sustainability.

Renewability means that trees can be planted and seeded and harvested over and over again on the same tract of land in what is known as crop “rotations”. Sustainability means that forest harvest can be sustained over the long term. How far into the future were foresters expected to plan? As long as there were vast acres of virgin (original) forest remaining this question was somewhat academic.

Today, however, sustainability is a vital issue in forestry. Most of the world's virgin forest are gone, and people must rely more and more on second growth or managed forests. Perhaps we now face, as never before, the limits to long term productivity. Harvest of wood products is a goal but a forester's principal task is to assure long-term productivity.

That is achieved by cutting the older, mature and slow-growing timber to make way for a new crop of young, fast growing trees.

Harvest Regeneration

Three examples of timber harvest-regenerate in methods (silvi-cultural system) illustrated how foresters manage stands to produce timber on a sustained basis.

i) Selection

Individual trees or small group of trees are harvested as they become matured. Numerous small openings in the forest are created in which saplings or new seedlings can grow. The resulting forest has a continuous forest canopy and trees of all ages. Such systems favour slow-growing species that are shade tolerant.

ii) Clear Cutting

In clear cutting, an entire stand of trees is removed in one operation. From the forester's point of view, clear cutting is the easiest way to manage a forest and most economical. Regeneration may come from sprouts on stumps, from seedlings that survive the logging operation, or from seeds that germinate after the harvest.

iii) Shelter Wood

In shelter wood system, the forest canopy is removed over a period of years, usually in two cuttings. After the forest harvest, natural regeneration begins in the understory. By the time the second harvest is made enough young trees have grown to assure adequate regeneration. Shelter wood system favour species that are intermediate and intolerant to shade. Such systems are difficult to use successfully and are the least used of the three silvicultural methods described.

Table 1: Tropical Forest Trees And Their Uses

TREE SPECIES	COMMON OR TRADE NAME	WOOD DENSITY at 15% (KGM ⁻³)	MAJOR USES
<i>Tectona grandis</i>	Teak	660	For decorative use, veneer and plywood for furniture and paneling, utility uses: sawn wood and plywood for building construction, utility grade furniture and packaging etc
<i>Triplochiton seleroylon</i>	Obeche	590	Utility uses sawnwood and plywood for building construction, utility grade furniture, packaging and also for decorative uses and paneling.
<i>Brachylaera-huduinisli</i>	Muhutu	930	Industrial and heavy construction-roof trusses, joists, platform and scaffolds, mining, bridges rail road, ports etc
<i>Cedrela odorata</i>	Cenbal American cedar	480	For decorative use; veneer and plywood for furniture and paneling
<i>Chlorophora excelsa</i>	Itoko	660	For veneer and plywood for furniture and paneling. Utility uses: sawn wood and plywood for building, packaging. They are fast diminishing in availability because of forest destruction and unsuccessful artificial regeneration.
<i>Entadrophrayma spp</i>	Gedunohor, sapele, uoile	560-660	Decorative uses plywood for furniture and paneling and veneer. Utility use: sawn wood and plywood for building construction, furniture, packaging etc.
<i>Naudea dederichi</i>	Opepe	750	Utility uses: sawnwood and plywood for building construction, packaging. Decorative use: plywood and for furniture and paneling and veneer
<i>Diosphyros</i>	Ebony	800-1200	Utility uses: sawnwood and plywood for building construction utility grade furniture, packing etc.
<i>Ocotae rodiael</i>	Green heart	1040	Industrial and heavy construction –roof trusses, joists, platforms bridges, railroad, ports, etc
<i>Khaya spp</i>	Mahogany	590-800	For decorative and utility purpose as they are high valued species that are fast diminishing in availability because of forest destruction and artificial regeneration.
<i>Cassopourae malosara</i>	Pillar wood	770	For industrial and heavy construction
<i>Lovoa trichloides</i>	African walnut	560	For both decorative and utility purpose, like constructing, furniture making and paneling
<i>Afzelia spp</i>	Atzelia	830	For utility uses sawn wood and plywood for building construction, utility grade furniture, packaging
<i>Terminalia superba</i>	Afara; lumber	560	For both decorative and utility purpose.

Table 2: Uses Of Forest Products (Plants)

S/N	COMMON OR NAME	BOTANICAL NAME	FAMILY	USES
1	Avocado	<i>Persea americana</i>	Lauraceae	It is pyriform, green, with a high oil content rich in vitamins B, A & C.
2	Banana	<i>Musa sapientum</i>	Musaceae	Some with high sugar content are eaten for dessert. Some with high starch are used for cooking or beer brewing. It is grown for local consumption on most smallholdings throughout the tropics and large plantations as an export crop.
3	Cashew	<i>Anacardium occidentale</i>	Anacardiaceae	It is basically used as a valuable cash crop for export purposes on large plantations.
4	Cassava	<i>Manihot esculenta</i>	Euphorbiaceae	The core is rich in starch, also calcium and vitamin C. local consumption as well as a staple food
5	Cocoa:	<i>Theobroma cacao</i>	Sterculiaceae	
6	Coconut	<i>Cocos nucifera</i>	Palmae	The endosperm of the nut is dried to make copra from which oil is extract.
7	Coffee	<i>Coffea Arabica and coffea robusta</i>	Rubiacaceae	Used mostly as commercial production on large plantations and as a cash crop by peasant farmers on small plots.
8	Cotton	<i>Gossypium Spp</i>	Malvaceae	The lint is used to make processed cotton, the seeds contain 18-24% edible oil and the residual cake is rich in protein and used for cattle feed
9	Date palm	<i>Phoenix dactylifera</i>	Palmae	The fruit has a high food value; sugar content about 54% and protein about 7%.
10	Eggplant	<i>Solanum melongena</i>	Solanaceae	The fruit is eaten as a vegetable boiled, fried or stuffed for local consumption
11	Groundnut	<i>Arachis hypogea</i>	Leguminosae	Seeds are rich in oil, protein and vitamins B and C. also used as an export crop.
12	Maize	<i>Zea mays</i>	Graminaeae	It serves as food crop, for fodder and as a vegetable-seed processes is often used to produce a more uniform, high yielding crop.
13.	Mango	<i>Mangifera indica</i>	Anacardiaceae	Fruit is a fleshy delicious drupe eaten raw or now canned, also used in chutney and pickles to be eaten with curry.
14	Millet	<i>Panicum miliaceum</i>	Gramineae	It is used as a famine reserve crop as staple food crops.
15	Oil palm	<i>Elaeis guineensis</i>	Palmae	The oil is extracted of the mesocarp of the fruit, palm oil contains vitamin A, and is used to make soap and in industry. Kernel oil is higher quality and is used for margarine and other food stuffs. The oil cake residue is used for livestock food.

16	Okra	<i>Hibiscus esculenta</i>	Malvaceae	The fruit is a beaked pyramidal capsule with a high mucilage content and is used as a vegetable either boiled or fried. The ripe seeds contain 20% edible oil for local consumption.
17.	Onions	<i>Allium Spp</i>	Amaryllidaceae	It is used as a local consumption and as a cash crop.
18.	Pawpaw papaya	<i>Carica papaya</i>	Caricaceae	The edible reddish flesh is eaten for breakfast and dessert, also for jam, flavouring and caning papin, a proteolytic enzyme, is used for tenderizing meat. The fruit has a high vitamin A and B content.
19.	Passion fruit	<i>Passiflora edulis and P. quadrangularis</i>	Passifloraceae	The globose fleshy berry is eaten fresh and also the fruit juice is very rich in vitamin C.
20.	Pineapple	<i>Ananas cosinosus</i>	Bromeliaceae	The fruit is multiple organ with a very high sugar content, and is rich in vitamins A and C the fruit is orange when ripe, with yellow flesh, and is eaten fresh as a table fruit it can be shipped unripe, and many are canned for export.
21.	Cowpea	<i>Phaseolus vulgaris</i>	Leguminosae	The seed is eaten which is rich in protein sufficiently rich to be a meat substitute.
22.	Rice	<i>Oryza sativa</i>	Gramineae	For local consumption and commercial production for export.
23.	Rubber	<i>Hevea brasiliensis</i>	Euphorbiaceae	Used for the production of latex.
24.	Sesame	<i>Sesamum indicum</i>	Pedaliaceae	The seeds contain oil which is used for salads, and cooking in soups, paint, medicines, perfumes and as a synergist for pyrethrum. The seed is also rich in protein.
25.	Sisal	<i>Agave sisalana</i>	Agavaceae	The fibres obtained from the leaves are grown as ornamentals.
26.	Sorghum Spp	<i>Sorghum Spp</i>	Gramineae	Used extensively as livestock food. Red-grained varieties are used to make beer, white grained ones for flour.
27.	Soyabean/ soybean	<i>Glycine max</i>	Leguminosae	It is used as a high protein source in human diet. It is also used for stock feed.
28.	Sugar cane	<i>Saccharum officinarum</i>	Gramineae	The cane has a high sucrose content which is rich in carbohydrate.
29.	Sweet potato	<i>Ipomoea batatas</i>	Convolvulaceae	The tubers are an important staple food, and may also be processed for starch, glucose, or alcohol. Leaves and vines used for cattle food.
30.	Tea	<i>Camellia sinensis</i>	Theaceae	The leaves contain caffeine, polyphenols and essential oils, and also grown as a cash crop.
31.	Tobacco	<i>Nicotiana tabacum</i>	Solanaceae	Leaves for stimulant
32.	Tomato	<i>Lycopersicon esculentum</i>	Solanaceae	The fruit is fleshy berry, red or yellow when ripe containing vitamins A and C. the fruit is used raw or cooked, made into soup, sauce, juice, ketchup, paste, puree or powder, canned and used unripe in chutneys.

FOREST AND THE PHYSICAL ENVIRONMENT

Given the dynamic nature of global ecosystem, environment change, driven by man-made natural cause, is inevitable. Man has always had an impact on the environment but recently the consequences of people's actions were limited in space and internally. However, economic activities and the rate of population growth have increased to the point where the effect of humanity on the environment can no longer be ignored.

The quality of many of the basic elements of the natural resources base- air, water and soil, etc. is deteriorating; the widespread degradation of forest resources is a particularly poignant example. Forest act as windbreaks and prevent street and gully erosion by significantly reducing surface run off. Current incidence of blown-off house roofs, gully erosion and flooding in towns and village were unheard of when areas were under adequate forest cover.

One of the most widely discussed environmental issues nowadays is the prospect of global climate change. This phenomenon has been ascribed to the significant increases in the emission of key greenhouse gases (GHGs) namely CO₂, nitrous oxide and methane (CH₄); into the atmosphere through human activities which include burning of fossils fuels, deforestation (mostly by burning) to make land available for agriculture and grazing and burning of wood and charcoal for fuel. The resultant increased concentration of the GHGs in the atmosphere raises the atmospheric temperature, a situation generally referred to as global warming.

Table 3: Some Commercial Timber Plant

S/N	COMMON NAME	BOTANICAL NAME	FAMILY	UTILIZATION
1.	Ucar	Bucida bucerash	Combretaceae	This is commonly planted as ornamentals and urban shade trees, it is also used in making charcoal
2.	Maria, maria	Calophyllum Calaba L.	Guttiferae	This is used for beams, posts furniture, cabinetry, craft and millwork, and a food source for fruit bat etc.
3.	Capa prieto	Cordia alliodora	Boragum aceae	Its wood is used for pulp, post, charcoal and turnery and also for ornamental.
4.	Deglupta	Eucalyptus deglupta blume	Myrtaceae	This produced pulpwood and furniture grade lumber, it is also used as an ornamental because it is attractive.
5.	American Muskwood, Guaragua O.	Guarea guidonia L.	Meliaceae	This is used as shade for coffee plantation and for charcoal, firewood, veneer etc.
6.	Mahoe, majo	Hibiscus elatusio	Maluaceae	This is used for musical instrument, interior trim, furniture and also as an ornamental.
7.	Caribbean pine	Pinus caribea moreleyt	Pinaceae	This is used for construction lumber, plywood, chipboard, millwork, and pulpwood. This is also used for windbreaks and reforestation of eroded sites.
8.	Big-leaf	Swietenpa	Meliace	This is also used for plywood, interior trim, art and craft, construction and furniture. It is widely used as ornamentals and avenue tree.
9.	West indies mahogany	Swieenia mahogany	Meliaceae	This is used for simulating and restoring classic furniture as well as for craft. It is also important for restoration of dry sites.
10.	Hybrid mahogany	Swieteria mahogany	Mwliaceae	This is frequently planted along highways and for farm and city shade because the tendency of its root to raise and crack side walks and curs, also for craft etc
11.	Teak tech	Techona grandis L. F.	Combretaceae	This is very expensive. It is used for

				construction of pleasure boat, furniture, trim, novelties.
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Table 4: Forest Products Gathered And Used Mostly By Women And Commonly Found In The Eastern Forest Zone Of Nigeria (With their Local And Scientific Names)

LOCAL NAME (IGBO)	BOTANICAL NAME	USES OF PLANT
Uda Uziza Oshosho Ehuru Utazi	Xylopia spp Piper guinense Tretapheura tetraptera Morodora myristica Gongromeme latifolaim	They are medicinal forest products used particularly for women after child birth.
Ujuju Chuanwu	Myrian thus arboreus Ocimum gratissimu	They serve as other medicinal plants
Udala Icheku Ube	Chrysophyllum albidum Landophia duleis var Daeryodes edulis	Fruits
Mmimi Agbono Agiri opu Achi	Dannetia tripetala Iruingia gabonensis ver excelsa Parka biglobasa Brachytestegia spp	They serve as spices and cooking additives as they add taste and flavour to food
Akpalata Okazi Oha oji	Afzelia Africana Gnetum spp Meroconpus milbraedil	These are leafy vegetables which helps boost the blood contents in the human body as they are rich in vitamin
Oji Adu Gworo Okpa	Cola acuminata Garcinia kola Cola initida Tetracarpidum Conophorum	These are nuts which can be used for traditional ceremonies and also in preparation of native medicine.
Achara Nehe Ukwa	Pennoctum purpurem Sacoglottos gabonensis Treculia Africana	These are essential for animal grazing and livestock feeds

Table 5: Some Uses Of Cultivated And Uncultivated Forest Tree/ Shrub Leaves In Household Nutrition And Health Care In Omo Forest Reserve

S/N	LOCAL NAME	SCIENTIFIC NAME	PLANT TYPE	FAMILY	USES	FORM USED	MODE OF USE
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1.	Iyeye	Spondias Mombin pen	Tree (uncultivated)	Anacardiaceae	For cure of headache, cough	Fresh and dry	Cooked as concoction with other ingredient
2.	Ewe abo	Anonna senegalensis pers	Tree (uncultivated)	Amaranthaceae	Soup	Fresh	Vegetable soup
3.	Efo tete	Amaranthus vigidos linn	Herb (cultivated)	Amaranthaceae	Soup	Fresh	Vegetable soup
4.	Efo soko	Celosia argentea linn	Herb (cultivated)	Amaranthaceae	Soup	Fresh	Vegetable soup
5.	Alubosa elewe	Allium ascalonicum linn	Herb (cultivated)	Alliaceae	Soup, pile and Malaria fever	Fresh and dry	Soup condiment. Cooked with other herbs. As malaria and pile concoction
6.	Kaju	Anaeardium occidentals linn	Tree (cultivated)	Anacardiaceae	Malaria fever. Typhoid fever	Fresh and dry	Cooked with other herbs as concoction against malaria and typhoid fever
7.	Ewe abo	Ananna senegalensis pers	Tree (uncultivated)	Anonnaceae	Sore treatment	Fresh	Crush the leaves and on sore or injury
8.	Ahum	Alstonia boonce	Tree (uncultivated)	Apocynaceae	Malaria fever, pneumatism	Fresh	Cook the leaves with other as concoctions for drinking
9.	Oparun-	Bambusa vulgaris	Tree (uncultivated)	Bianbrealae	Malaria fever, boil	Fresh	Cooked as concoction for boil, grind the leaves and put on affected part to ease pain and release pores.
10.	Ewe akoko	Newbouldea laevis seem	Tree (uncultivated)	Bognonaceae	Malaria fever	Fresh	Cook with other herbs and taken as concoction
11.	Araba	Ceiba petandra (linn) gaerth	Tree (uncultivated)	Bombaceae	Soup	Fresh	The fresh tender leaves are added as soup condiment e.g. okor soup to increase drawability

Source: 2.0 Gbile (2002)

THE VALUE OF TROPICAL FORESTS

All forests have both economic and ecological value but tropical forests are especially important in global economy. These forests cover less than 6 percent of the earth's land area, but they contain the vast majority of the world's plant and animal genetic resources. The diversity of life is astonishing. The original forests contain more than 500 species of trees in 70 botanical families. By comparison, temperate forests have relatively few species. Such diversity is attributed to variation in elevation, climate and soil and to the lack of frost.

There is also diversity in other life forms; shrubs, herbs, epiphytes, mammals, birds, reptiles, amphibian and insects. One study suggests that tropical rain forests may contain as many as 30 million different kinds of plants and animals, most of which are insects.

In the tropics forestry is a mixture of modern innovations and ancient techniques borrowed from local tradition. Plantation forestry is common. Forest reserve have been established for timber harvest, wildlife, habitat, scenery, outdoor recreation, or water shed protection. And in the tropics agroforestry-tree growing combined with agricultural cropping- is much more common than else where.

Table 6: Some Useful Plants And Trees Associated With Tropical Agriculture

BOTANICAL NAME	COMMON NAME	FAMILY	STATUS	USEFUL PRODUCT
Barassus aethiopur	Fan plam	Arecaceae (palmae)	Wild	The leaves are useful for farms basket, stem for timber, meant for food
Calamus spp	Rottan palm	Arecaceae (palmae)	Wild	Stems for structures and fibre
Cocos nucifera	Coconut	Arecaceae (palmae)	Cultivated	Nus for food, oil stem for structures fibre
Elaeis guineensis	Oil palm	Arecaceae (palmae)	Cultivated, semi-wild	Edible and industrial oils, structural materials, brooms.
Phoenix dactylifera	Date palm	Arecaceae (palmae)	Cultivated	Fruit for food
Raphia spp	Raphia palm	Arecaceae (palmae)	Cultivated, semi-wild	Wine, fibre (piasaava) structural materials roof thatch
Saceharum officinarum	Sugar cane	Poaceae; Granineae	Cultivated	Sugar, by-product for brewing
Hevea Brasiliensis	Rubber (para)	Euphorbiaceae	Cultivated	Used for the production of latex for rubber
Passifloara edulis and P-quadrangularis	Passium- Fruit	Passifloraceae	Wild	The globose fleshy berry is eaten fresh and also the fruit juice is very rich in vitamic A. C
Gossypium terberceum G. barbadense	Cotton	Tiliaceae	Cultivated	Seed Fibre
Urena lobata	Urena	Tiliaceae	Wild, semi-wild	Bast fibre
Phaseolus lunatus	Oil bean	Leguminosae	Semi wild	Stem for structures and tool heads, seed for food.
Perocarpus spp	Camwood	Leguminosae	Wild, semi-wild	Leaves for food
Cola acuminata	Kola nut	Stercutiaceae	Cultivated	Nuts seed as stimulant
Theobroma cacao	Cocoa	Sterculiaceae	Cultivated	Nuts seed as stimulant
Eugenia Uniflora	Pitanga cherry	Myrtaceae	Cultivated	Hedge, plant, fruit used for food
Eucalyptus spp	Pitanga cherry	Myrtaceae	Cultivated	Hedge, plant, fruit used for food
Eucalyptus spp	Pitanga cherry	Myrtaceae	Cultivated	Wind break, soil conservation fuel
Monodora myristica	African nutmeg	Annonaceae	Wild	Seed for seasoning
Azadirachla Indica	Neem	Meliaceae	Cultivated	Shade tree, leaves used as anti malaria
Anacardium Occidentale	Cashew	Anacardiaceae	Semi-wild, cultivated	Apple and nuts for food, soil conservation
Dacryodes edulis Canarium sch-weinfurthis	Bush bitter tree incense tree	Burseraceae Burseraceae	Cultivated Wild	Fruit for food Fruit for food, wax for lighting

WOOD BASED INDUSTRIES

The wood based industries in Edo State for instance are important employees of both rural and urban labour. The Edo State product industry consists mainly logging, saw milling and plywood production. The wood based industries hold second place in the provision of employment opportunities with about 14% of the total employees in the state engaged in wood based industries. Thus, forestry had provide employment in the public service, including the army and the police.

Non-Timber Forest Products (NTFP) Industries

There is increasing awareness and recognition that throughout the country, forests contribute significantly to rural economy, providing non-timber subsistence goods and services as well as marketed items with a great diversity of products. These are simply referred to as “Non-Timber Forest Products” (NTFP). Non-timber forest products according to Etukudo (2001) can be defined as all the biological materials (other than industrial round wood and derived sawn timber, wood chips, wood based panels and pulps) that may be extracted from forest ecosystems and as utilized within the household, or are marketed.

Forest Resources as a Source of Revenue to Government

Revenue to government from forestry has been on the increase. In spite of the dwindling forest resources the period 1991 to 2002 has recorded forest revenue ranging from 1.9 million in 1991 with a peak of N71.5 million in 1997. It therefore, largely explains the level of commitment of all cadres of staff of the department. Thus, over the years, forestry has gone a long way to boost the state economy. Some of these revenues are shared to traditional councils, local government councils, and communities who are original owners of the forests thereby affecting the lives of a lot more people in the state.

Other Benefits of Forest Resources are:

- (i) **Wildlife Resources:** It serves as a source of bush meat that contains about 26% protein.
- (ii) **Forest foods** which includes seeds, fruits, leaves, root and tubers and mushroom which are rich in vitamins, energy minerals and proteins. They are used as medicine or tores and as substitute for staple foods during periods of scarcity.
- (iii) **Forest medicine:** forests are highly valued as sources of natural medicines, which are essential compounds of health care delivery system. Herbal medicines are used by the vast majority of both rural and urban dwellers even when orthodox medicine are within reach and affordable. Plants medicines are generally the first recourse for rural households. Plant medicines are used in both curative and preventive treatments. There are numerous forests plant species in the state, which are taken to prevent sickness and to encourage growth and they are particularly used for protecting and healing children in the state.

Table 7: Major Wood Products And Their Uses

WOOD PRODUCT	PRODUCT MARKET	END USES
Fuel wood and charcoal	Fuel	Cooking and heating
Industrial round wood poles and posts	Industrial building and construction	Mining agricultural implements and tool handles, scaffolding, bridges, flatforms, ceilings, fence posts etc. electricity and telegraph transmission lines
Pulpwood	Power and communications industrial	Paper and paperboard
Sawnwood	Building and construction manufacturing packaging	Doors, windows, millwork and joinery, ceilings, and flooring, partitioning, beams, rafters, bridges, platforms, scaffolding, furniture, boatbuilding, truck bodies, wood carving, railroad, ties, and cars, decorative wood products, sheating etc. Boxes, crates, coffins
Wood-based panels, veneer and plywood particle board fibre board other panel products	Building and construction. Manufacturing packaging	Paneling, flooring , ceilings, partitioning, sheating, roofing, flatforms, staircases, etc. Boxes, crates, coffins

Paper and paper board. Cultural papers (newsprint, printing and writing paper) industrial papers (other paper and paper board)	Education and communication. Building and construction. Manufacturing. Packaging other	Newspapers, books, magazines journals and periodical writing papers, exercise books, notebooks, registers, posters etc.
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WILDLIFE MANAGEMENT

Wildlife as a branch in Agriculture implies all things that are living outside the direct control of man and therefore includes all non cultivated plants and non domesticated animals. Hence wildlife entails wild animals, birds and plants in general, especially those limited for food or sport. This definition therefore gives coverage to plants, animals, reptiles, fish, amphibians and invertebrate. Birds and mammals are featured disproportionately relative to their abundance in nature.

Management implies human decision and manipulation. Wildlife management sometimes is better termed wildlife conservation as in some cases/circumstances the best technique for conserving a landscape is to leave it alone and doing so may not fit the definition of management. While in such instance there may be no management at all. Conservation is therefore defined in Encyclopedia Americana (2003) as getting the maximum use of the greatest number of available natural resources that are valuable to the greatest possible number of people for the longest period of time. On the other hand Encyclopedia Britannica (1981), defines conservation as the achievement of the highest sustainable quality of living for mankind by the rational utilization of the environment.

Therefore, wildlife management could simply be defined as application of ecological knowledge to population of vertebrate animals and their plant and animal associates in a manner that strikes a balance between the needs of those populations and the needs of man.

Application of ecological knowledge involves three basic management approaches, namely:

- Preservation by allowing nature to take its course without human intervention.
- Direct manipulation of animal population by crippling, culling etc.
- Indirect manipulation of animal population by altering the vegetation present.

IMPORTANCE OF WILDLIFE

Wildlife is a natural resource of an overwhelming degree of usefulness. However, the value of Nigeria’s wildlife has only been realized a little (Adeyoji, 1975). Wildlife represents the principal source of animal protein for the rural majority in most African countries (Ajayi 1979). He further added that wildlife, particularly forest mammals, account for between 20% and 90% of total animal protein consumed in Benin Republic, Cameroon, Ghana, Liberia and Nigeria. The supply of bush meat from the wild no doubt serve as the only possible measure to bridge the gap between livestock production and human population growth. In developing countries livestock production was increasing at a rate of 1.28-1.0% per annum, while protein demand was expected to grow at between 4 and 5% per annum over the period of 1985 (Ajayi 1971).

The importance of wildlife to traditional medicine cannot be over emphasized. Wildlife has made charming contribution to medical research over the world. Life animals (rats, primates have been used in many medical research laboratories speed world wide. Primates are widely used by virtue of their close relationship to man. The rhenes factor was 1st discovered in Rherus monkey before it was applied to man (Ajayi and Halstead 1979). The clawed toad, Zenopus, is used in pregnancy task. Also, the toad is used in countless undergraduate practical to demonstrate nerve muscle action.

Table 8: Wildlife Resources

Consumptive utilization	Non-consumptive Utilization
Bush meat, Fruits (Germ. Marmala de) Concoctions	Camping, Hiking, skiing, amphitheatre and campfire, talks, sport, hunting, hunting, Aesthetic (Appreciation and Beauty), Game viewing, bird watching, trophy (Rhino horn, tusk, leather) firewood, leaves used in wrapping foods etc.

CONCLUSION

Forestry embraces the production, distribution and consumption of forest products and services. Forestry production includes the raising of forest crops such as timber in artificial plantations, or the maintenance of naturally occurring resources to up grade their productive potential. Forestry practiced for timber production is known as silviculture. Production decisions are based on information about the soil and ecology of the forest.

The intangible output of forestry production includes protection of soils against erosion and flooding the use of tree vegetation (shelter belts) to protect against harsh local climates and in the improvement of precipitation and maintenance of recreational sites, landscaping and tree planting in urban centre and the prevention of world bush fires.

The distribution of forest products is a crucial aspect of forestry in providing the link between the resources and the user (consumer). But forest management in the tropics suffers from persistent under funding most forestry investments are unattractive to private sectors. Because of low and long-differed returns, governments have a cautious attitude to forestry investments. There is restricted demand for forest products in the tropics and exclusive reliance cannot be placed on export markets to provide the demand for tropical forest products. There is growing protectionism around the world and processed tropical timber has restricted access to markets in developed countries. Hence Nigeria as a country must themselves provide a demand for wood, consumption of wood and the lower prices. Low domestic consumption will increase reliance on demand export markets.

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