



Global Advanced Research Journal of Agricultural Science (ISSN: 2315-5094) Vol. 4(2) pp. 042-067, February, 2015.
Available online <http://garj.org/garjas/index.htm>
Copyright © 2015 Global Advanced Research Journals

Review

An overview of plant resources and their economic uses in Nigeria

*Kutama¹, A. S., ¹Dangora, I. I., ¹Aisha, W. ¹Auyo, M. I., ² Sharif, U. ³Umma, M, and⁴Hassan, K. Y.

¹Department of Biological Sciences, Federal University, Dutse. P.M.B 7156-Nigeria

²Department of Biological Sciences, College of Arts and Sciences, Kano

³Department of Biology, Kano University of Science & Technology, Wudil.

⁴Department of Biology, Sa'adatu Rimi College of Education, Kano

Accepted 17 February, 2015

Nigeria is an agrarian country blessed with almost uncountable number of plant species; in water, on land e.t.c. Plants are and remain the indispensable gift of nature given to mankind whose uses were discovered by man even before civilization. This paper reviews some important aspects of plants which include their origin, classification, morphology, as well as economic uses especially in the Nigerian context. It is pertinent therefore that students, researchers as well as readers who are interested in plants would find this paper very educative as it explore majority of plant species and their economic uses in Nigeria.

Keyword: plant species, economic uses, taxonomy, morphology, Nigeria.

INTRODUCTION

Evolution of Plant

Over 350 million years ago, the first living organism which resembled a plant appeared. It was the blue - green algae (*Cyanophyceae*) which lived in the sea and can still be found in many water bodies today. According to Michael (2003) the evolutionary history of plant began a very long time ago. Algae has probably existed on moist ground for over a billion years, but higher plants, as in the kingdom *Plantae* did not emerged until 700 million years ago at the earliest. The earliest evolutionary history of plant on land appears in the early Ordovician period, about 475 million years ago, although many paleobotanists suspect more years ago. Micheal (2003) stated that the first land plants were non-vascular bryophytes represented today by

mosses, hornworts and liverworts. The bryophytes which represented the basal group in the evolutionary history of plants may have set the stage for the colonization of the land by animals by securing Carbon dioxide from the atmosphere.

Around 425 million years ago, the first vascular plants appeared, like the simple bifurcating, sporangia (spore-producing structure) type found in Australia (Stephen, 1980). According to Stephen (1980) throughout the Devonian period (416 – 560 million years ago) plants progressively grew in height to become as large as today massive ferns. At the stage of the Devonian period, plants were mostly non-vascular and correspondingly diminutive, but by the end of the period, seed-bearing plants were evolved forming huge forest. The explosion of botanical diversity during this period has been called the Devonian explosion.

*Corresponding Author's Email: kutamasak@yahoo.com

The next in the evolutionary history of plant was much later, during the cretaceous period, when flowering plants (angiosperms) first emerged. Using flower to attract bees, which would then go on to pollinate other plants, angiosperms were genetically diverse, and a great evolutionary success. One of the latest varieties of plants is the grasses which evolved from the angiosperms just 35 million years ago (Cronquist, 1988).

Roger (2001) reported that evolution claims that plants descended from algae as that colonized the empty landmass. Plants couldn't have evolved until there was a sufficient Ozone layer to block radiation. The many structures that plants require in order to overcome gravity, keep drying out, and reproduce would have to have developed gradually over millions of years. Molecular and fossil evidences have complicated the evolutionary model that explains how plants evolved from simple to complex forms. The simple groups have evolutionary dead ends. So plants must have evolved simultaneously in several different ways. Seed plants are alleged to have had an advantage over other ancient plants, and they dominated the landscape. The ancient forests are the service for the different coal beds in evolutionary theory. Flowering plants were the most recent to appear since leaves were remodeled to attract pollinators and accomplish reproductive functions.

Origin of Plants

According Raven *et al.* (2001), there are two views regarding the origin of plants, the evolution model and the creation model. They further explained that in the creation of plants all types of plants were crated on the 3rd day of creation. The evolutionary model holds that plants evolved from primitive green algae some 400 million years ago.

Roger (2007) explained the origin of plants as are supposed to be 475 million years old. Evolutionists generally agreed that to colonize the land, this could not have occurred until after there was an intact Ozone layer to protect the plant from some of the atmosphere's harmful UV (Ultra violet) rays. Since this was an alien land, plants had to move to the new landscape. Several key systems had to be developed to prevent drying out (desiccations), to remove or absorb nutrients from the soil, to grow upright without the support of water, and to reproduce on land. The view of adaptation is a key difference in the evolution and creation models.

Adaptation is defined as a physical trait or behaviors due to inherited characteristics that gives an organism the ability to survive in a given environment (Stune *et al.*, 1985). In evolutionary biology, adaptations are often acquired by modifying existing structures to accomplish new tasks. In the case of algae turning into higher plants, the pre-existing structures are mostly absent. The first plants to evolve were the small mosses and liverworts

(bryophytes), but there are evolutionary gaps to believe this for, these did not lead to the vascular plants that are common today. The vascular plants are surprised to have evolved separately from other algae. The ferns, club mosses and horsetails (Pteridophytes) are the suggested common ancestors to the vascular plants that are present in large quantities today. The carboniferous era is described as having giant ferns and club mosses of which most of them survives today. The vast forests of the carboniferous era are the source of many coal and oil reserves in the evolutionary model.

According to Stephen (1980) the next step in the evolutionary development is the development of seed plants. The first plants to evolve were the gymnosperms, cone-bearing plants like conifers, ginkgo and cycads. These plants had an adaptive advantage over the Pteridophytes and dominated the forest of the late Paleozoic era. Roger (2007) summarized the evolutionary concept of plants as:

- Plants appear as fossils over 400 million years ago.
- Plant evolved from green algae and invaded the vacant land niche
- Many adaptations were needed as plants moved from water onto land.
- Many symbiotic relationships evolved to support plants on land.
- Giant ferns and cycads that formed fossil fuel dominated early forests. These were later replaced by seed plants.
- The first fossils of vascular plants occur at 375 million years ago.
- The first fossil seed plant replaced fern and cycads.
- Flowering plant evolved slowly and appears in the fossil 130 million years ago.

Taxonomy of Plants

Meaning of Plant Taxonomy

Joseph (1981) defined taxonomy as the study and classification of variation among organisms, with respect to causes, consequences and patterns. Lincoln *et al.* (1998) further defined taxonomy as the theory and practice of describing, naming and classifying organisms. Plant taxonomy is the science that finds, describes, classifies, identifies, and names plants accordingly.

Spooner *et al.* (2003) stated that taxonomy could be more generally defined as the science of developing methods and philosophy for the systematic grouping of organisms. According to him taxonomists are basically concerned with;

1. Determining what is a species (or their subdivision as subspecies)
2. Distinguishing the species from others and descriptions
3. Description of geographic boundaries and mapping their distributions
4. Investigating the relationships and
5. Determining proper names of species and higher order ranks (as general families) using international rules of nomenclature.

Davis and Heywood (1963) stated that species have a central place in taxonomy as classification.

History of Plant Taxonomy

Taxonomy is probably the oldest science and started almost from the beginning of human existence. At earliest stage, Plants have been classified based on their edibility and other uses for humans. The development of western plant taxonomy has at least five distinct periods.

- Pre- literature
- Ancient literature
- Medical or dark ages
- Renaissance
- Theory of evolution in which Darwin published this on the origin of species in 1859 (Stephe 1980).

According to Cronquist (1989) two major concepts impacted in classification are:

1. Species have evolved from one another over time i.e. species have evolutionary histories – phylogenesis
2. Species are not represented by ideal types as Aristotle thought but by variable population.

Nomenclature and Codes

Linnaeus in 1735 tried to classify all organisms into either plants or animals. This classification called the **two-way classification** of organisms does not however, taken into consideration: (i) unicellular organisms like *Euglena*, *Volvox*, *Amoeba* e.t.c. (ii) fungi as non-chlorophyllous organisms and (iii) viruses, which stands a bridge between living and non-living world. Because of these inadequacies, **three-way classification** was proposed to perfect the Linnaeus classification of organisms. According to this classification, all other organisms which are neither plants nor animals constitute the third division of organisms. This classification like the two-way classification is unaccepted because the third division is a mixture of diverse organisms which may not be linked at all. For example, the degree of variation between fungi and viruses is greater than the degree of their similarities and they are considered as one.

The more acceptable, though not perfect classification of organisms was proposed by R.H. Whittaker in 1969 which cries that all organisms can be placed into five kingdoms,

thus **five-way/kingdom classification** and the kingdoms are:

1. **Monera**: - the division of organisms without a nucleus (i.e., a prokaryotic cell organization), such as bacteria and blue-green algae (cyanobacteria). They are normally colonial, unicellular and in some cases the cells are organized into filaments.

2. **Protista**: - the kingdom of diverse group of single celled eukaryotic organisms and is divided into unicellular algae other than cyanobacteria and protozoans. We can understand here that, algae are the ancestors of plant kingdom and protozoans as ancestors of animal kingdom

3. **Plantae**: - are a diverse group of eukaryotic and chlorophyllous multicellular organisms. It includes macroscopic algae like seaweed, bryophytes, pteridophytes e.t.c.

4. **Fungi**: - is a kingdom of a large group of eukaryotic and achlorophyllous organisms that includes micro-organisms such as yeasts and molds (British English: moulds), as well as the more familiar mushrooms. They are either saprophytes or parasites and hence cause damages to their hosts.

5. **Animalia**: - kingdom of multicellular, eukaryotic and ingestive organisms. Examples, mammals, aves, reptiles, fishes, arthropods, mollusc, e.t.c.

- a) Two-way/ kingdom classification;
Plants and Animals classification
- b) Three-way
Plants, Animals and Others classification
- c) Five-way/five kingdoms classification as; kingdom Monera, Protista, Plantae, Fungi, and Animalia

Organisms under the kingdom Plantae within a group are more closely related to other members of their own group than to members of another group, just as you are more closely related to your parents as well as brothers and sisters than you are to families of other students in your class. Therefore, we will study plants classification as it is important towards understanding seedless plants as a group.

Although the classification is becoming obsolete, plants are generally grouped into:

1. **Thallophytes**: - these are lower and non-vascular plants with undifferentiated body (thallus). They include fungus, algae and lichens.

2. **Bryophytes**: - are plants with more advanced body than thallophytes. The plant body is also non-vascular, but differentiated into root-like (rhizoids) and leaf-like structures. They include mosses, hornworts and liverworts.

3. **Pteridophytes**: - are vascular (have phloem and xylem) lower plants that have their bodies differentiated into true leaves, stems and roots. They include horsetails, ferns, club mosses and quillworts

4. **Spermatophytes**: - are higher vascular plants which have their body differentiated into into true leaves, stems and roots. They include gymnosperms and angiosperms.

Plants kingdom is further grouped into four major divisions or phyla, namely;

Thallophyta, Bryophyta, Pteridophyta and Spermatophyta. Thallophytes, bryophytes and pteridophytes are grouped together and are called the cryptogams (from cryptos = hidden and gammein = to marry. This means they never bear seed or flower in their life-cycle, they reproduce by spores and hence can be alternatively called as **seedless** or **flowerless plants**. However, spermatophytes are seed-bearing plants and they are called **phaenerogams** (from phaenero = visible and gammein = to marry) or seed plants. Tracheophytes on the other hand, are plants possessing vascular tissues (xylem and phloem) and they include one group of cryptogams (pteridophytes) and all spermatophytes.

How to Classify Plant

The first successful attempt to standardize names and to classify all known plants was from Linnaeus (1763). His classification was based in similarities and differences among groups of plants. Those showing "relevant" similarities were grouped together. Linnaeus most fundamental object in his classification was the species. He used the species in to oldest definition being an immutable, entity (the typological species, an outdated morphological species concept that allows little to no variation within species). The next higher level of grouping of species was the genus. (Spooner Linnaeus used a combination of two Latin names (one of the genus and e for specific epithet) to singularly identify and name a species thus, binary nomenclature was born, which we still use today.

Staflau (1971) stated that a full species name consists of 3 elements, namely;

- 1) A genus name
- 2) A species epithet and
- 3) A taxonomy author (e.g

Solanumtuberosum L.)

The standard instructions to authors of scientific journals have been listed, viz. Sub-species, species, series, section, genus, tribe, family, order, class, division and kingdom. If more ranks are needed, a potentially infinite number can be created for all ranks by using qualified terms such as sub or super for example to create sub-genus and super genus. Families have standard endings J-aceae (e.g Rosaceae), order – ales (Rosales).

Ranks only have meaning in an relative (not absolute) sense in that a genus is less inclusive than a family, and a family is less inclusive than an order (Stevens, 1998). Because there are no Universally accepted definitions of what constitutes a genus, species or other rank, they are interpreted differently by different taxonomists **Limpers** are taxonomists who focus more on similarities than differences, discount the importance of minor variation among individuals, and tend to recognize fewer taxa. **Splitters** on the other hand, focus on small differences

among individuals and recognize more taxa (Spooner et al., 2003).

Botanists agreed that nomenclature should be as stable as possible and not change drastically with classification. De condole in 1867 devised a set of nomenclatural rules which finally led to the first edition of the '*regales de la Nomenclature Botanique*.

Greuter et al. (2000) stated that the ICBN has six main principles; the first three enter into our discussion of how plants get their names, and how new names may be assigned to species that previously had another name.

Principle I: Botanical nomenclature is independent of zoological and bacteriological (and viral) nomenclature however. Some suggest a unified code (Biocode) should be sought.

Principle II: The application of names of taxonomic groups is determined by means of nomenclatural types. A nomenclatural type is that element (usually a herbarium sheet) to which the name of a taxon is permanently attached. What this means is that when a species is described, type of species needs to be designated that serves as a reference point for other to compare to their concept of names.

Principles III: The nomenclature of a taxonomic group is based upon period of publication. This means that the earliest validity published name is the proper name assigned to a taxon (Greute et al., 2000).

Mears (1989) reported the two purposes of the ICB as:

1. Denote ranks of the taxonomic groups i.e. the hierarchy kingdom
Phylum (Division) python
Class – opsida, subclass – idea
Family – aceae – ci
Genus
Species
2. Lay down the rule or naming plants within their groups

Plant Names/Identification

There are two aspect of "naming" the generation of the name and the application of the name. Application of a name is better called "identification" before anything can be identified the names must be generated names might he generated in a moment of creation or evolve gradually (Robert, 1830).

Scientific names

Stebbins (1956) stated that at the simplest level of scientific classification, each plant has a name made up of 2 parts.

3. A generic (genus) name
4. A specific name or epithet- together, there two names are referred to as binomial.

According to Stone *et al.* (1985) a generic name is a collective name for a group of plants indicating a grouping of character. The specific name, allows us to distinguish between different organisms within a genus. Botanical names are always written with the genus name first starting with capital letter and – specific name along follows the generic name starting with a lower case letter.

The generic and specific names are generally Latin or are Latinized words from other languages particularly Greek. Therefore these two names should be underlined separately when written or italicized when typed, example, the botanical name of cowpea is written as Vigna unguiculata L. or *Vigna unguiculata* L.

Plant Classification

According to Stebbins (1956) two goals of plant taxonomy are the identification and classification of plant. Plant identification is the determination of the identity of an unknown plant by comparison with previously collected specimen manuals. The process of identification usually involved comparing the specimen with a published name. Once a plant specimen has been identified, its name and properties are known.

Raven *et al.* (2005) stated that plant classification is the placing of whole plants into groups or categories to show some relationship. Scientific classification follows a system of rules that standardizes the results and groups successive categories into a hierarchy.

Chapter Two

The Structure and Functions of Plant

INTRODUCTION

Plants are considered as one of the basic entity of life. According to Barkil (1997) plants are critical to other lives on this planet because they form the basis of food webs, as all plants are autotrophic, creating their own food using water, carbon dioxide and light through a process called photosynthesis. Earlier on, it was stated that plants are one of the major kingdoms of life forms (Robbins *et al.*, 1965). Plants are the only life forms that can produce their own food using energy from sunlight (Sarojini, 2005).

For time immemorial, plants have been one of the most useful natural resources in the world. Even today, plants remain one of the most important materials people use for building houses, making clothes, cooking and heating (Kaufman *et al.*, 1989). Robbins *et al.* (1965) reported that it is impossible to think about the environment without plants. According to them, plants create the base for most environments. The importance of plants and therefore for our understanding of them, cannot be overstated and or emphasized. They are an integral part of the earth's

ecosystem, and without them life as we know it, would not be possible (Rich, 1996). But the question of what are or who are the plants remains very intriguing. Different people hold different views as to what are plants? Here, we would define plants from botanical points of view. Thus;

What Are Plants?

Raven *et al.* (2005) defined plants as living organisms belonging to the kingdom Plantae. They include familiar organisms such as trees, herbs, bushes, grasses, vines, ferns, mosses and green algae. However, Bold *et al.* (1987) had earlier stated that plants comprise a major group of multicellular eukaryotic organisms known as the kingdom Plantae. But according to Stone *et al.* (1985) plants are multicellular photosynthetic organisms that are believed to have evolved from green algae.

Plants are photosynthetic with a cell wall enclosing the cytoplasm. Today we recognize plants as photosynthetic (mainly terrestrial) eukaryotes with cell wall as was earlier define by Walter (1979). Similarly, Leopold *et al.* (1975) also referred to plants as living things/organisms that grows in the earth and usually has a stem, leaves and roots. Purves (1994) stated that by most definitions, a plants is multi-cellular, non – motile, eukaryotic, has cell wall constituting of cellulose, autotrophic and exhibits alternation of generation, has a distinct diploid (Saprophyte) and haploid (gametophyte) phase. In the same vein, Stephen (1994) considered plants as one of the major kingdoms of living things that include land plants, mosses, ferns, conifers and flowering plants. Whatever the meaning of plant, they are essentially green eukaryotic organisms capable of producing their food and replenishing the atmosphere. Hence, plants are the sources of live on this contemporary universe.

Structure of a Plant

Stone *et al.* (1985) described the external part of a plant as organs; these organs include parts such as root, stem, leaves and flower. According to Robbins *et al.* (1965), the basic plant structure includes two organs system, the shoot system and the root system. The root, stem and leaves are the growing or vegetative part of the plant while the flowers are the reproductive part of the plant which gives rise to the fruit and seed (Sarojini, 2005). Anton *et al.* (1987) reported that plant parts are divided into two basic sections, the root and the shoot. The root is comprised of all the structures below the soil and the shoot is comprised of the structures above the soil. According to them, each of these structures is vital in different ways to the plant existence. The function (s) of the major part of plant is given below;

Function of the Main Parts of a Plant

The Function (s) of the individual part of the plant is summarized in the table below;

Uses of The Main Parts of Plants

Raven *et al.* (2001) reported the uses of a root in terms of root crops as to any edible underground plant structure. Edible root include cassava, sweet potato, beet, carrot, potato, yam etc. Also spices obtained from roots include sassafras, Laconia, Angeles, ginger etc. The fish poison and insecticides rotenone is obtained from root of *Lonchocarpus* spp. Important in medicine from roots are ginseng, aconite, ipecac, gentian. Several legumes that have nitrogen fixing root nodules are used as green manure crops which provide nitrogen fertilizer for other crops. Roots can also protect the environment by holding the soil to prevent soil erosion (Clark, 2004).

Accordingly, Usher (1974) stated that stems provide a few major staple crops such as potato. Sugar cane stem are a major source of sugar. Vegetables from stems are *Asparagusbambus* shoots, *Cactus*, and water chestnut. Cellulose from tree trunks is a food additive in bread, *Greetedparmesan* cheese and other processed foods. Gum arabic is an important food additive obtained from the trunk of *Acaciasenegal* trees. Medicines obtained from stem include Guanine from the bark of cinchona trees. Wood is used in thousands of ways e.g. building, furniture, boats, air planes etc. wood pulp widely used to make paper cellulose, springs and so on.

Berrie *et al.* (1987) reported that some leaves like neem leaves are used to cure a number of human and animal diseases. Leaves are also used to manufacture a number of drugs and medicine. They have been traditionally used in bathing patients suffering from measles or chicken pox. Some leaves serves as vegetables to man either eaten raw or cooked. Leaves are used in industries and pharmaceutical industry. A large number of drugs and herbal medicines have been using leaves as their active ingredient.

Types of Plant

According to Adrian (1991) stated that plants are the backbone of any garden. Though the growths of plant are more or less in the same process, the plants are different as far as their characters are concerned. He further went on to explain that plants are divided into the following because of their distinctive characteristics. These are Annuals, Biennials, Perennials, Shrubs, *Acalypha*, Hispida, Bulbs, Creepers and Climbers, flowering and ornamental trees.

Kaufman *et al.* (1989) classified plant types as shrubs, trees, perennials, annuals, climbers' creepers herbs, palms, Roses, Bulbs, conifers, ferns, cycads, Grasses and

succulents. Cronquist (1988) furthermore stated that there are four main types of plants, viz: flowers, herbs, shrubs, bushes and trees. According to him, flowers control the process of seed creation by male and female gametes. Humans have used parts of plants for centuries as decoration, food and medicine.

As reported by Kaufman *et al.* (1989) and Adrian (1991) Herbs are the most commonly used. Herbs are low growing plants which bear seeds and do not have wooden stems. Herbs are used for culinary, medicinal and spiritual uses. In Table 2 below, examples of different categories of plants have been given together with their botanical names.

Perculiar Features of A Plant

The most striking and important feature of plants is their green color, due to the presence of a pigment called chlorophyll. According to Stern and Kinsley (1991) the distinguishing features of plants are:

- Multi-cellular
- Photosynthetic (Chlorophyll **a** and **b** and carotenoids in thylokoid membranes)
- Food storage molecule – amylose starch
- Structural *Polysaccharide* – cellulose
- Life cycle – spore – alternation of generations – diploid sporophyte
- Haploid gametophyte
- Produce multi-cellular embryo protected in multi-cellular haploid (gametophyte-egg sac) tissue which differs from green algae.

Different Plant Species Found in Nigeria

Several hundreds of thousands plant species are found in the various parts of Nigeria. Some of the common plant species found in Nigeria are listed in table 3 below

Some Common Uses of Plants

Life and health are both dependent on plants. We rely on plants for food, medicine and for creating a healthy environment. Plants also provide us with fibers for making cloth, rope, paper etc. There are numerous dyes obtained from plants used to color our fabrics. Many plants have oil – rich seeds and these oils can be extracted when they have variety of uses (Evans, 1998). Many of the plants are edible and they can also be used as lubricants, fuel, for lighting, in plants and varnishes, as wood, preservative, water proofing and so on.

Rich (1996) gave a detailed database on the uses of plants as follows.

- **In the Garden**

1. Plants can be used for fencing. Example of plant used for fencing

Examples:

Latin name	Common name	Use
<i>Carpobrousaeguilaterus</i>	Sea	Fire retardant
<i>Erica cerinthoides</i>	Fire health	Fire retardant

Source :- Rich (1996)

2. Ground cover: Usually low growing plants that can be grown with other plants, especially scrubs and trees, to prevent the growth of weeds.

Example:

Latin name	Common name	Use
<i>Convallariakeiskei</i>	Lily of the valley	Ground cover
<i>Asarumcaudatum</i>	Wild Ginger	Grounder cover
<i>Arctostaphylos uvaursi</i>	Bear berry	Ground cover

Source – Rich (1996)

3. Other uses include as hedge, mulch, rooting hormone, shelter belt and so on.
 4. As fertilizers
 5. Plants are used for activating compost heaps providing biomass for composting, using as instant compost.

Example:

Latin name	Common name	Use
<i>Salendula officinalis</i>	Pot Marigold	Compost
<i>Judlans nigra</i>	Black walnut	Compost
<i>Saliva officinalis</i>	Sage	Compost

Source – Rich (1996)

- Fertilizer provides a concentrated solid plant food.

Example

Latin name	Common name	Use
<i>Ulexeuropacus</i>	Gorse	Fertilizer
<i>Pseudotsugamenziesii</i>	Dogalas fir	Fertilizer

Source – Rich (1996)

d. Pesticides

- e.** Plant extracts are used as fungicides to arrest the growth of kill fungi.

Example

Latin name	Common name	Use
<i>Allium sativum</i>	Garlic	Fungicides
<i>Armoracia</i>	Horse radish	Fungicides
<i>Rusticana</i>	Horse radish	Fungicides
<i>Brassica deracea</i>	Cauli flower	Fungicides
<i>Botrytis</i>	Cauli flower	Fungicides
<i>Drosera</i>	Sundew	Fungicides
<i>Rotundfolia</i>	Sundew	Fungicides

Source: Rich (1996)

- f.** Plants can also be used as herbicides, insecticides and parasiticide.

g. Building Material

- h.** Plants provide insulation against extremes of temperature, sound or electricity.

Example

Latin name	Common name	Use
<i>Phragmites australis</i>	Common reed	Insulation
<i>Seguonia</i>	Fire health	Fire retardant
<i>Sempervirens</i>	Fire	Fire retardant
<i>Calluna vulgaris</i>	Heather	Fire retardant

Sources: Rich (1996)

- i. Plants used to give a water proof roof to building. Example;

Latin name	Common name	Use
<i>Leptosperum Scoparium</i>	Tea tree	Roofing
<i>Quercus variabilis</i>	Chinese co-k Oak	Roofing

- j. Plans used for making thatched roofs

Latin name	Common name	Use
<i>Imperatecylindrical</i>	Cogongrass	Thatching
<i>Livistonaaustralis</i>	Cabbage palm	Thatching
<i>Phragmitesaustralis</i>	Common reed	Thatching

Source: Rich (1996)

Other building materials obtained from plants are pipes pitch, plaster.

- In the Kitchen

- k. Plant can be used as bottles

Example

Latin name: *Lagenaria siceraria*

Common name: Bottle Govard

Use: Bottles

- l. Plants such as gourds are used as containers e.g bottle gourd.

In the home

- m. Plants are used as a living for sleeping on or putting fruits.

Example

Latin name	Common name	Use
<i>Beckmannia</i>	Slough grass	Bedding
<i>Erucformis</i>	Tufted sedge	Bedding

Sources: Rich (1996)

- n. Plants are used as brush for cleaning clothing as a paint brush etc.

Example

Latin name	Common name	Use
<i>Agaveutahensis</i>	Century plant	Bush
<i>Luccaglauca</i>	Soap weed	Bush

Edible Uses

Vegetable oils

Latin name	Common name	Use
<i>Gossypium hirsutum</i>	Cotton	Oil
<i>Arachishypogeal</i>	Peanut	Oil
<i>Camelliasinensis</i>	Tea plant	Oil
<i>Carycacordiformis</i>	Bitternut	Oil

- Plants are used as gum especially as stabilizers, emulsifiers, thickening agents, adhesives etc, can be chewed

Latin name	Common name	Use
<i>Acacia dealbata</i>	Mimosa	Gum(edible and other)
<i>Aciphylla squararrosa</i>	Spear grass	Gum
<i>Apocynum cannabinum</i>	Indian herms	Gum

Plants can be used as button Example

Latin name	Common name	Use
<i>Sapindus drummondii</i>	Western soapberry	Buttons
<i>Quercus cerris</i>	Turkey oak	Buttons

Plants can be latex for a source of rubbers Example

Latin name	Common name	Use
<i>Nerium oleander</i>	Oleander	Latex
<i>Apios Americana</i>	Groundnut	Latex
<i>Asclepias galioides</i>	Bedstraw	Latex

- Various plants that can be used in place of items such as nappies.

Example

Latin name	Common name	Use
<i>Iris germanixa</i>	Purple fleg	Baby care
<i>Ceanothus velutinus</i>	Sticky laurel	Baby care

- Plants are used as cleanser

Latin name	Common name	Use
<i>Citrus limon</i>	Lemon	Cleaners
<i>Prunus persica</i>	Peach	Cleaners
<i>Gallium aparine</i>	Goose grass	Cleaners

- Plants that can be used to give body protection from severe weather.

Example

Latin name	Common name	Use
<i>Sesamum indicum</i>	Sesame	Weather protection
<i>Bursaria spinosa</i>	Christmas bush	Weather protection

- Some few plants are also used to forecast weather.

Latin name	Common name	Use
<i>Calendula officinalis</i>	Pot marigold	Weather forecasting
<i>Hypoxis hygrometrica</i>	Golden weather Glass	Weather forecasting

- Some plants are used as repellent to deter but not necessarily kill various mammals, birds, insects etc.

Example

Latin name	Common name	Use
<i>Achlystriphylla</i>	Vanilla leaf	Repellent
<i>Alliumcepa</i>	Onion	Repellent
<i>Alliumsativum</i>	Garlic	Repellent

- Plants are used to combat pollution through various bioremediation techniques. Example;

Latin name	Common name	Use
<i>Aloe vera</i>	Aloe vera	Pollution
<i>Eichhorinia</i>	Water hyacinth	Pollution
<i>Crassipes</i>		Pollution
<i>Hedera helix</i>	Ivy	Pollution
<i>Tulipa gesneriana</i>	Tulip	Pollution

Table 1. Major Plant parts and their function (s)

Plant Part	Functions
Root	1. Holds the plant firmly to the soil, 2. Stores food in some plants. 3. In others, the root is used as a vegetative propagating material.
Stem	1. Support the plant 2. Holds the leaves in the best position for receiving sunlight, 3. Conducts water and mineral salts from the roots to the leaves 4. Manufacture food from the leaves to the different parts of the plant 5. Holds the flowers and fruits in their best position so that they are easily pollinated or dispersed, respectively.
Leaves	1. Main photosynthetic organs. 2. Leaves are used for respiration and transpiration 3. Some Leaves store water and food. 4. Also serve to protect the plant
Flowers	1. Used for Pollination 2. Production of fruits and seeds

Table 2. Some Examples of Plant types

a. Trees	
Botanical Name	Common Name
<i>Acacia galpini</i>	Monkey thorn
<i>Acacia karro</i>	Sweet Thorn
<i>Combretum erythrophyllum</i>	River Bush willow
<i>Combretum krausii</i>	Forest bush willow
<i>Ficus carica</i>	Common beech
<i>Dracaena hookeriana</i>	Dragon tree
<i>Kigelia Africana</i>	Sausage tree
<i>Azadirachta indica</i>	Neem tree
<i>Chlorophora excelesa</i>	Iroko tree
b. Shrubs	
<i>Leptospermum scoparium 'Cheery Brandy'</i>	Tea Bush
<i>Acalypha wilkesiana</i>	Copper leaf
<i>Acalypha wilkesiana</i>	Barberry
<i>Combretum microphyllum</i>	Burning bush / flame
<i>Coprosma</i>	Mirror plant
<i>Hibiscus rosasinensis</i>	American beauty
c. Annuals	
<i>Allium</i>	Garlic
<i>Allium cepa</i>	Onion
<i>Brassica</i>	Mustard
<i>Lathysus odoratus</i>	Sweet Pea
<i>Calendula officinalis cultivars</i>	Pot Marigold/English Marigold

Table 2. Continue

o. Bulbs	
<i>Eucomis autumnalis hybrids</i>	Pineapple flower/pineapple lily
<i>Lilium hybrids</i>	Lily
<i>Iris xiphium</i>	Irish Dutch
<i>Anemone coronaaria</i>	Wind flower
<i>Babiana stricta hybrids</i>	Baboon flower
<i>Hyacinthus orietails</i>	Hyacinth
p. Climbers/Creepers	
<i>Gelsemium sempervirens</i>	Carolina jasmine
<i>Trachelospermum jasminoides</i>	Star jasmine
<i>Monstera delicicosa</i>	Delicious monster
<i>Clematis montana</i>	Cleamatis
q. Perennials	
<i>Alocasia</i>	Elephant's plant
<i>Clivia miniate hybrids</i>	Bush lily
<i>Convallaria majalis</i>	Lily-of-the-valley
<i>Viola odorata</i>	Sweet valley
<i>Thymus X citriodous</i>	Lemon thyme
<i>Thymus vulgaris</i>	Thyme
r. Roses	

Table 2. Continue

<i>Rosa 'Glowing Achievements'</i>	Rose 'crimson Glory'
<i>Rosa 'Iceberg'</i>	Rose 'Glowing Achievement'
<i>Rosa Queen Elizabeth</i>	Rose 'Queen Elizabeth'
s. Succulents	
<i>Aloe barberae</i>	Tree aloe
<i>Aloe maculata</i>	Soap aloe
<i>Aloe vera</i> (= <i>A. barbadanensis</i>)	Aloe vera
<i>Aloe ferox</i>	Cape aloe
t. Palms	
<i>Butia capitata</i>	Jelly pal
<i>Chamaedorea elegans</i>	Parlour palm
<i>Cocos nucifera</i>	Coconut palm
<i>Syagrus romanzoffiana</i> (= <i>Cocos plumose</i>)	Queen palm
<i>Phoenix dactylifera</i>	
u. Herbs	
<i>Allium sativum</i>	Garlic
<i>Brassica species</i>	Mustard
<i>Salvia officinalis</i>	Sage
<i>Thymus vulgaris</i>	Thyme
v. Grasses	
<i>Elegia capensis</i>	Broom Reed
<i>Festuca 'Gluca'</i>	Blue Fescue
w. Ferns	
<i>Blechnum gibbum</i>	Blechnum
<i>Disksonia Antarctica</i>	Soft tree fern
<i>Platynerium bifurcatum</i>	Staghorn fern
<i>Nephrolepis</i>	Sword fern
x. Cycads	
<i>Encephalartos caffer</i>	Cycad
<i>Encephalartos ferox</i>	Zululand cycad
<i>Encephalartos glensteini</i>	Eastern cape Giant cycad
y. Conifers	
<i>Thuja plicata</i>	Conifer
<i>Platycladus orientalis 'Golden Rocket'</i>	Conifer 'Golden Rocket'
<i>Kuniperus horizontalis 'Price of Wales'</i>	Conifer 'Prince of Wales'
z. House Plants	
<i>Aphelandra</i>	Zebra plant
<i>Calathea</i>	Peacock plant
<i>Ceropegia woodii</i>	Rosary vine
<i>Chlorophytum</i>	Spider plant
<i>Cissus antractica</i>	Kangaroo vine
<i>Citrus</i>	Calmundin orange, lemon tree or sweet orange
<i>Maranta</i>	Prayer plant

Sources: Cronquist (1988), Adrian (1991), Kufman *et al.*, and Womersley, (1981).

Table 3. Common Plant Species Found in Nigeria

Species name	Botanical name	Family name
Guinea grass	<i>Panicum maximum</i>	Gramineae
Elephant grass	<i>Pennisetum purpureum</i>	Gramineae
Gamba grass	<i>Andropogon tectorum</i>	Gramineae
Sugarcane	<i>Saccharum officinarum</i>	Gramineae
Rice	<i>Oryza sativa</i>	Gramineae
Maize	<i>Zea mays</i>	Gramineae
Wheat	<i>Tricum aestivuum</i>	Gramineae
Tamarind	<i>Tamarindus indica</i>	Caesalpinaceae
F1 amboyant/flame of the forest	<i>Delonix regia</i>	Caesalpinaceae
Pride of Barbados	<i>Caesalpinia puleherrima</i>	Caesalpinaceae
White mangrove	<i>Avicennia Africana</i>	Caesalpinaceae
Raphia palm	<i>Raphia sudanica</i>	Palmae
Date palm	<i>Phoenix dactylifera</i>	Palmae
Oil palm	<i>Elaeis guineensis</i>	Palmae
Coconut palm	<i>Cocos nucifera</i>	Palmae
Mango	<i>Manigifera indica</i>	Anacardiaceae
Cashew	<i>Anacardium occidentale</i>	Anacardiaceae
Gum Arabica	<i>Acacia rabina</i>	Mimosaceae
Babul	<i>Acacia nitotica</i>	Mimosaceae
Locust beans	<i>Parkia clappertomiama</i>	Mimosaceae
Sensitive plant	<i>Mimosa pudica</i>	Mimosaceae
Pigeon pea	<i>Cajanus cajan</i>	Papilionaceae
Cowpea	<i>Vigna unguiculata</i>	Papilionaceae
Groundnut	<i>Arachis hypogeal</i>	Papilionaceae
Bread fruit	<i>Treculva africana</i>	Moraceae
Neem	<i>Azadiracahta indica</i>	Moliaceae
Mahogany tree	<i>Khaya senegalensis</i>	Moliaceae
Red mangrove	<i>Rhizophora racemosa</i>	Moliaceae
Shea butter	<i>Butyo spermum parkii</i>	Sapotaceae
Tobacco	<i>Nicotiana tabacum</i>	Solaaceae
Tomato	<i>Lycopersicum esculentum</i>	Solanaceae
Garden egg	<i>Solanum melongena</i>	Solanaceae
Potato	<i>Solanum tuberosum</i>	Solanaceae
Cotton	<i>Gossypium hirsutum</i>	Malvaceae
Hibiscus	<i>Hibiscus rosasinesis</i>	Malvaceae
Okra	<i>Hibiscus esculentus</i>	Malvaceae
Jute fibre	<i>Hibiscus cannabis</i>	Malvaceae
Cassava	<i>Manihot esculenta</i>	Euphorbiaceae
Castor oil	<i>Ruciinus communis</i>	Euphorbiaceae
Yam	<i>Dioscorea alata</i>	Malvaceae
Rubber	<i>Hevea brasiliensis</i>	Euphorbiaceae
Black walnut	<i>Mansonia altissima</i>	Sterculiaceae
Kola nut	<i>Cola nitida / cola acuminata</i>	Euphorbiaceae
Indian almond	<i>Terminalia catappa</i>	Sterculiaceae
Custard apple	<i>Canganga odonata</i>	Sterculiaceae

Table 3. Continue

Bitter gourd	<i>Colocynthis vulgaris</i>	Combreteceae
Calabash	<i>Lagenaria siceraria</i>	Annonaceae
Water melon	<i>Citrus citrillus</i>	Cucurbitaceae
Water lots	<i>Nymphaea lotus</i>	Cucurbitaceae
Spinach	<i>Amaranthus hibridus</i>	Cucurbitaceae
Water leaf	<i>Amaranthuscaudatus</i>	Nymphaceae
Baobab	<i>Adansonia digitata</i>	Amaranthceae
White silk cotton	<i>Ceibe pentandia</i>	Amaranthceae
Onion	<i>Allium cepa</i>	Bombacaceae
Garlic	<i>Allium sativum</i>	Liliaceae
Ginger	<i>Zingiber officinale</i>	Zingiberaceae
Banana	<i>Musa sapiantum</i>	Musaceae
Plantain	<i>Musá paradisiaca</i>	Musaceae
Guava	<i>Psidium guajava</i>	Anacardiaceae
Tangerine	<i>Citrus reticulata</i>	Rutaceae
Sweet orange	<i>Citrus sinensis</i>	Rutaceae
Grape	<i>Vitis spp</i>	Rutaceae

Latin name: *Rubus lineatus*, Common name: Fencing

1. As fire retardant: Plants that do not easily burn and can be used as barrier plant to limit the spread of forest fires.

Chapter Three

Plant Resources in Nigeria

According to Federal Environmental Protection Agency, FEPA (1992) Nigeria has over 7000 species of algae, and other lower plants (bryophytes, etc), 150 species of ferns and 5,000 species of higher vascular plants. The Nigerian ecology varies from tropical forest in the south to dry savanna in the far north, yielding a diverse mixture of plant and animal life (Nigeria "Student's Encyclopedia, 2009). Guardian *et al.*, (2007) stated that Nigeria is an agrarian society with about 70 percent of her plant resources and over 140 million populace engaged in agricultural production. This sector provides food, employment, foreign exchange, as well as raw materials for the nation.

Conventional uses of plant in Nigeria

Plant as Food

Food is any substance which provides an organism with energy and nutrients necessary for its existence. Humans are dependent upon plants for their very existence and

most of the human food supply worldwide is derived from not more than 20 crops namely; banana, barley, cassava, citrus, coconut, corn (maize), oats, peanut, pineapple, potato, pulses (beans, peas), rice, rye, sorghum, soybean, sugar beet, sugarcane, sweet potato, wheat and yam and all these crops are found in Nigeria (Kutama, 2012). Evans (1998) stated that human nutrient depends largely on cereals, especially maize (or corn), meat and bone. Other staple crops include potato, cassava, and legumes. Human food also includes vegetables, species and certain fruits, nuts, herbs and edible flowers. Beverage produced from plant includes coffee, tea, wine, beer and alcohol. Food additives include gum Arabic, locust bean, gum, starch, pepper. Edible wild plants which could be used as leafy vegetable, edible fruits and seeds and starchy roots and tubers include leafy vegetables, fresh fruits and juices, soup condiments, edible seeds, sweeteners and those used to wrap foods. (Ola- Adams and Onyeachusin, 1993; Isawumi, 1993; Mosakaiyo, 1994). Okafor (1993) has observed that there are over 300 edible plants in the Nigerian flora.

Leafy vegetables

1. *Amaranthus spp*
2. *Assystasia gangetica*
3. *Boerhavia diffusa*
4. *Ceiba pertandra*
5. *Cytospermae selegalense*
6. *Emilia sonchfolis*
7. *Gnetum Africana*

8. *Portulaca oleracea*
9. *Talinum traingulare*
10. *Telfaria occidentalis*

Species

1. *Aframomum danielli*
2. *Aframomum malegueta* (alligator papper)
3. *Cleistophalis patens*
4. *Gongronema latfolium*
5. *Modora myristica*
6. *Monodora tesnfolia*
7. *Peper guineesis* (African black pepper)
8. *Xylophia acthiopium*

Fresh Fruits and Juices /Seeds

1. *Ananas comosus*
2. *Annona murcate*
3. *Annonidium mannii*
4. *Anona squamosa*
5. *Anthrocayran klaneana*
6. *Anthrocaryan klaneamum*
7. *Arachis hypogea*
8. *Blighia sapida*
9. *C. perpuilchrum*
10. *Canarium schwanfurthii*
11. *Carica papaya*
12. *Carpolobia lutea*
13. *Chrysophyllun allbidum*
14. *Chrysophyllun perpulchrum*
15. *Citrillus lunatus*
16. *Citrus sp*
17. *Cocos nucifera*
18. *Cola acuminata*
19. *Cucurbita maxima*
20. *Daryodis edulis*
21. *Demettia tripetete*
22. *Diallum guneensis*
23. *Dissotis grandiflora*
24. *Eribroma oblonga*
25. *Eligeria jambos*
26. *Garcinia kola*
27. *Lacina trachanta*
28. *Irvingia gabonansis*
29. *Irvingia gabunesis var dulcis*
30. *Landoiphi dulacis*
31. *Landoiphia owariensis*
32. *Lecariodisau cupaniovides*
33. *Musa spp*
34. *Myrianthus aborea*
35. *Napoleana vogelii*
36. *Pachira aquatica*
37. *Saba florida*

38. *Sorindea warneke*
39. *Spondias monbin*
40. *Synsepalum dulafain*
41. *Syzygium guineense*
42. *Teracorpidium conophorum*
43. *Trichoscyphaacuminata*

Soup Condiments

1. *Abelmoschus esculentus*
2. *Afzelia bella*
3. *Afzelia bipindesis*
4. *Brachystegia evrcoma*
5. *Brachystegia kennedyii*
6. *Brachystegia nigerica*
7. *Brachystegia spp.*
8. *Capsicum spp.*
9. *Citrillus lunatus*
10. *Cucumeropsis manic*
11. *Gongronema latfo liv*
12. *Irvingia gabonensis var. diulcis*
13. *Irvingia gabonensis var. excelsa*
14. *Lycopersicum sp.*
15. *Pentaclethra macrophylla*
16. *Ricinus communis*
17. *Solanum melongena*
18. *Telfarina occidentalis*

Sweeteners

1. *.Dioscoreophyllum cumminisii*
2. *Dissotis grandflora*
3. *Synsepalum dulcificum*
4. *Thaumatococcus denielli*

Food Wrappers

1. *Thaumatococcus demilli*
2. *Mitragyna ledermannii* (for cola nuts)

Source: Spore, 1994

Plant as Drugs

Interest in the medicinal uses of plant has been on the upsurge in recent times. Humans depended on plant for cure of most ailments until scientific advances introduced chemical syntheses. Many nations are now integrating traditional medicine into primary health care system. Twenty five percent of global prescription drugs are directly derived from plants (Isichei, 2005). Almost 300 plants are listed as being of medicinal value in western Nigeria alone (Adjanabora *et al.*, 1998). These plants are spread over several families including ferns, bryophytes, and some fungi. Okafor and Ham (1999) identified 55 plants as being of medicinal value in southeastern Nigeria while Anwana and Obot (2003) reported that 67 plant species from 38

families are used for treating 18 categories of ailments by people living inside and within the support zone of the Cross River National Park.

According to Balick and Cox (1996) one of the earliest plant derived drugs is aspirin from the plant known as *Spiraea ulmaria*. For thousands of years many cultures around the world have used herbs and plants not just to eat but to treat illness.

Archaeological evidence shows that even pre-historic man used plant to heal. Today the World Health Organization (WHO) estimates that 80% of the world's population uses some form of herbal medicine (Idu and Oloronfemi, 2000). They further stated that many of the drugs now prescribed are from plants that ancient cultures used traditionally. The word "drug" means "to dry" because pharmacists, doctors and ancient healers often dried plant to use as medicines. About one-fourth of all conventional pharmaceuticals including roughly 120 of most commonly prescribed modern drugs uses at least one active ingredient derived from plants.

Common drugs made from plant /herbs.

Many drugs in commonly used today have botanical origins.

- Aspirin (salicylic acid) from white willow bark and meadow sweet plant.
- Atropine – used to treat irregular heart beat – from belladonna leaves.
- Colchicines used for gout-from Autumn crocus,
- Digoxin (Lanoxin) the most widely prescribed heart medication from foxglove, a poisonous plant
- Ephedrine used to wider or relax the airways – from the ephedra plant.
- Morphine and codeine-potent narcotics – from the opium poppy.
- Padi-taxel (Taxol) used to treat metastatic ovarian cancer-from the low tree
- Quinine – a drug for malaria from cinchona bark
- Vinblastine (Velban) and Vincristine (Docovin) anticancer drugs from periwinkle (Farnsworth *et al.*, 1985).

Plants as Timber Resources

The food and medicinal uses apart, plant are untimely involved in general economy. The products of the forest, for example, involved building material such as timber, which in Nigeria is supplied by such trees as the mahogany, *Khaya*, the obeche triplochiton and the Iroko *Chlorophora excels* (Naqui, 1975). Forest is primarily exploited, especially since colonial times, for export timber. The following species were considered as 'economic' in 1952 when various silvicultural treatments were commenced to maximize the timber resources (Okali and Ola-Adams, 1987; Lowe, 1993). Thus;

- <i>Afezeha bipindesis</i>	- G.
<i>thompsonii</i>	
- <i>Antiaris africana</i>	- <i>Khaya</i>
<i>ivorensis</i>	
- <i>Brachystegia nigerica</i>	- <i>Lophira alata</i>
- <i>Chiorophora excelsa</i>	- <i>Lovoa</i>
<i>trichiliodes</i>	
- <i>Cordia plateyhyrsa</i>	-
<i>Mansorca altissima</i>	
- <i>Entandophragma angolense</i>	- <i>Mitragyna</i>
<i>ledermarnii</i>	
- <i>Eribroma olonga</i>	- <i>Naudea</i>
<i>diderrichii</i>	
- <i>Erythrophleum spp.</i>	-
<i>Nosogordonia papeverfera</i>	
- <i>Guarea cedrata</i>	-
<i>Piptaderiastrum africarum</i>	
- <i>Sterculia rhinopetela</i> ..	- <i>Term inalia</i>
<i>ivorensis</i>	
- <i>T superba</i>	-
<i>Triplochiton scieroxylon</i>	

Ola Adams (1987) observed it in the report of Lyamabo (1977) that where as in 1950 only 17 species were thought to be of economic importance as commercially acceptable timber trees, by 1975 the number so regarded had increased to 47. For example, *Dancetha oliveri* can be considered one of the most intensely utilized timber species today.

Traditional Use of the Forest-Non-Timber Products

The forest can provide miscellaneous raw materials for building purpose, tools and weapons, artifacts, clothing and personal ornamentation and materials for ritual and magical purposes. This can be attested to by the many reports in the work of Okogie, and Okali (1993), Okafor (1993) has explored 171 indigenous woody plants of nutritional importance within the forest zone of Nigeria. Marakinyo (1994) preserved that the Ekuri community in the support zone of the Cross River National park in southern Nigeria identified five principal non- timber forest products that are of great commercial importance and they are:

- Gnetum Africana
 - Chewing sticks (*Garcinia mannii*, *Massulaia acuminatal*
 - Rattan (*Glamus spp.*, *Lassosperna spp.*, *onco-calamus spp.*, and *Eremospatha spp/*
 - Bush mango (*Irvingia gabonesis*).
- Ingo dye too comes from a tree *Lonchocarpus cyanescere*. Baskets and not snare supplied by pandanus, plant materials, raphis supplies broom and roofing materials, shear-butter fat comes from *Butyrespermumparadoxum* and fibers comes from cotton, sisal flex. Tannins are inorganic compound which unite

with certain proteins, such as animal skin to produce, or with iron salts to produce ink. Tannins materials are also employed in oil drilling to reduce the viscosity of the drill without reading specific gravity. These compounds are obtained from the red mangrove tree, *Rhizophoramangle*, abundant in south- eastern Nigeria (Naqui 1975).

Crop Plants in the Nigerian Economy

Cocoa, palm oil, groundnut, rubber and cotton were the major economic crops in pre- and immediate post-independent Nigeria. The major food crop has been cassava (Isichei, 2005), maize (corn), and rice (Kutama *etal.*,2009).

Plant as Horticulture

Thousands of plant species are cultivated to beautify the human environment as well as to provide shade, modify temperature, reduce wind speed, abate noise, provide privacy and prevent soil erosion (Ola-Adams *et al.*, 1977). Nigeria is endowed with rich natural vegetation full of attractive plants. Sanford and Isichei (1981) carried out a floristic survey of the new Federal Capital Territory (FCT) woody ornamental plants. They observed the following plant species:

- *Acacia barteri*
- *Acacia vulgaris*
- *Cassia sieherana*
- *Ficus abutilifolia* and so on.

Chapter Four

Economic Contributions of Plant Resources in Nigeria

In Nigeria, plants play a crucial role in developing the country's economy. Kunjani *et al.* (2006) stated that the rural people rely on plant resources for their domestic and primary health care needs. They collect the useful plants and their parts from various habitats such as forest, scrubs, and grass lands, cultivated field, wetlands and river banks. Odunayo (2005) reported that for over 18 months, farmers from the eight states in south western Nigeria were surveyed to discover how the plants were being used. Farmers in these places use seeds and stem of plants as propagates. The economic uses of the plant resource in Nigeria can be grouped as:

Medicinal Uses of Plants in Nigeria

Plant leaves, flowers, stems, seeds, fruits, bark, roots or any other part may be used for medicinal purposes. Plants produce a diverse range of bioactive molecules and secondary metabolites making them very rich sources of different types of medicine. Certain plants have been almo

st as important to man as their food uses. Man learnt to exploit plants for medicinal purposes almost as early as they cultivated them for food. Medicinal plants fall into the three broad groups of drugs; analgesics, antibiotics and vitamins. Gordian (2007) stated that medicinal plant species are so regarded because they are sources of well-known and medically useful secondary products as wide – ranging as pain killers like morphine, stimulants like nicotine, caffeine, cocaine with high potency in the management of ailments in homes. Plants form the main ingredients of medicine in traditional systems of healing and have been the source of inspiration for several major pharmaceutical drugs. Roughly 50,000 species of higher plants have been used medicinally (Karachi, 2006). The use of medicinal plants is increasing worldwide, related to the persistence and sometime expansion of traditional medicine and a growing interest in herbal treatment.

Some Medicinal Plants

The medicinal values of some indigenous plant species in Nigeria are listed in the table below

Aquatic Plant Resources of Nigeria

Nigerian aquatic plants occurring in most water bodies are similar to those in other tropical region. They are usually strictly zoned across the land/water ecotone and generally follow a pattern such as the fringe, seasonally flooded zone, mud zone and permanently flooded (Open water) zone (Obot, 1987). The fringe zone contains vegetation similar to terrestrial savanna. Elements in this zone include among others *Daniella Oliverii*, *KhayaSenegalensis*, *Syzygiumguineense*, *Ispherlina* spp. *Terminalia* spp, *Parkiaclappertomiama*, *Vitellariaparadoxum* and *Ficus* spp. The most frequent herbaceous plants are *Crotolariamicrocarpa*, *Cassiamimosoides*, *Digitariahorizontalis* and *Androposon* spp. The seasonally flooded zone is usually inundated for a couple of months of the year. The woody communities are usually *Mimosa pigra* and *Mitragjna* spp. The most frequent herbaceous plants are *Ludwigia erects* *Leersia haxandra*, *Vossia cuspidate* and *Oryza* spp. The mud zone is almost always, covered by water but may be exposed for few weeks. It is mainly colonized by *Echinochloa* spp. *Polygonum senegalense*, and *Vossia cuspidate*.

A comprehensive checklist of the aquatic plants of Nigeria (based on Kleman, 1948, White, 1965; Imevbore 1971, Obot, 1987) is given in the table below

Family / Species	No. of Species
1. ALIS MA LA CEAE	7
1.1 <i>Burnatia enneandra</i>	
1.2 <i>Caldesia oligococca</i>	
1.3 <i>C. renformis</i>	
1.4 <i>Limnophyton obtusfolium</i>	

Table 4. Names and Medicinal uses of some Plant species in Nigeria

S/N	Species Name	Family name	Local names	Common names	Parts used	Medicinal use(s)
1	<i>Abelmoschus esculentus</i>	Malvaceae	Ila, okweje, kubewa	Okra, lady's finger	Fruit, seeds	Fever, gonorrhoea, dysentery, catarrhal infections, emollient, antispasmodic, tonic
2	<i>Abrus precatorius</i>	Leguminosae	Ojuologbo omisinmisin, mesenmesen, iwere-jeje, Olorun yinni, otoberebere, Idon zakara	Crab's eye, rosary pea, love nut, jequirity	Root, leaves, seeds	Colds, cough, convulsion, rheumatism, conjunctivitis, contraceptive, antimicrobials, aphrodisiac, ulcer, anemia, antidote poison.
3	<i>Abutilon</i>	Malvaceae	Furu, kawo	African mallow, thutt	Leaves, root	Diarrhea, gonorrhoea, antipyretic, cough, piles
4	<i>Acacia ataxacantha</i>	Mimosaceae	Ihun, ewonadele, sarkakiyaa, uke	Benin rope Acacia	Young leaves	Dysentery, backache
5	<i>Acacia auriculiformis</i>	Leguminosae	Kasia ele	Earleaf acacia	Bark	Astringent
6	<i>Acacia nilotica</i>	Mimosaceae	Baani, booni, bagaruwa	Acacia, Egyptian mimosa	Fruits bark, exudates	Skin diseases, finger infections, insomnia, emollient
7	<i>Acacia sieberiana</i>	Mimosaceae	Siyi, sie, farakaya	Acacia	Bark, stem twigs, roots, leaves, latex	Anti-cancer, antipyretic, astringent, kidney disease, taeniocide
8	<i>Acalypha fimbriata</i>	Euphorbiaceae	Jiniwinini, kandiri	Acalypha	Leaves	Syphilis, asthma, anthelmintics, ulcers, rheumatism, antimicrobial & antifungal
9	<i>Acalypha godseffiana</i>	Euphorbiaceae	Jinwinni	Acalypha	Leaves twigs	Skin infection, antimicrobials
10	<i>Acalypha hispida</i>	Euphorbiaceae	Jiwene, jinwinni	Cat's tail, chenille plant, medusa's locks	Leaves, twigs	skin rashes, antimicrobial MED
11	<i>Acalypha wilkesiana</i>	Euphorbiaceae	Jiwene, jinwinin	Copper leaf, beef steak plant	Leaves, twigs	Skin rashes, antimicrobials, flatulence, constipation
12	<i>Acanthospermum hispidum</i>	Acanthaceae	Dangurono-gogoro, kasshinyawo	Starburr	Leaves, whole plant	Yellow fever, tuberculosis, stomach disorder, cough, purgative, rheumatism, migraine
13	<i>Acanthus montanus</i>	Acanthaceae	Ahonekun, irunmuarugbo, inyinyiogwu, ogwud, urunwashihshi	Bear's breech, white's ginger, leopard's tongue	Stemtwig, leaves roots	Syphilis, cough, emetic, urethral discharge, purgative, boils, anaemia, ant helmintics
14	<i>Achillea millefolium</i>	Compositae	Yaro	Yarrow, nosebleed, sneezewort, millefoil	Flowers, leaves, seeds	Haemostatic, wound, astringent, diaphoretic, piles

Table 4. Continue

15	<i>Achyranthes aspera</i>	Amaranthaceae	Aboro, hakooinmacijii	Abora	Rough chaff herb	Leaves, roots	Stomach disorders, Abortion, diarrhea, dysentery, skin diseases, malaria, venereal diseases, haemostic, cold
16	<i>Adansonia digitata</i>	Bombacaceae	Ose, igiose, kulambali	kukaa	Baobab	Leaves, fruit pulp, bark	Malaria, asthma, diarrhea, kidney and bladder diseases, demulcent, prophylactic, antihistaminic, skin disease, caries, antimicrobial
17	<i>Adenia cissamploides</i>	Passifloraceae	Arokeke, Godogbo		Adenia	Leaves, stem bark	Hypertension, nervous disorder, stress, cough, gonorrhea, antimicrobial,
18	<i>Adenia vennata</i>	Passifloraceae	Dodo, Yaga, Arokeke, oti		Akerbia	Leaves, roots, stem bark, fruits	Cough, bronchitis, urinary tract infections, fever, stem pulp is an aphrodisiac, syphilis, gonorrhea, anagelsic, diuretic, hypertension, fish poison
19	<i>Adenum Obesum</i>	Apocynaceae	Gariya			Stem, roots, fruit, juice	Wound dressing, ulcers, cardiac tonic, venereal disease. 20 A
20	<i>Adhatoda buchhoizii</i>	Acanthaceae				Fruits whole plant	Rheumatism, anti-inflammatory, fish poison
21	<i>Aerva lanata</i>	Amaranthaceae	Eweowo, aja, Alhaji, furfurata, fatumi	Efunile	Bhadram, cherula	Whole plant	Ulcers, wounds, snake bite, diuretic, purgative, anthelmintic, sore throat, kidney and bladder stones
22	<i>Afraegle paniculata</i>	Rutaceae	Sanga		Kokodi	Leaves, bark, bark, roots	Gastro-intestinal disorders, antispasmodic, skin diseases
23	<i>Afraegle paniculata</i>	Zingiberaceae	Oburo-wawa		Afromum lilies	Roots	Anthelmintics
24	<i>Aframomum melegueta</i>	Zingiberaceae	Ataire, atare, oji, citta, gyanda maryaji	itaye, ose	Alligator peper, grains of paradise	Leaves, seeds	Stimulant, smallpox, chicken pox, stimulant, anthelmintics, wounds, coughs, anaemia, rheumatism, measles, malaria, toothache
25	<i>Aframomum sceptrum</i>	Zingiberaceae	Oburoetu, oboro, oguro		Bear berry	Seeds, leaves	Measles, smallpox, lumbago, stimulant.
26	<i>Afromosia laxiflora</i>	Leguminosae	Shedun, makarfo, ocha	abua	Kulkuli	Root	Intoxicant, headache, body pains, headache, ophthalmia, anticonvulsant, rat ovulation blocked through effect on pituitary gland
27	<i>Afzelia Africana</i>	Leguminosae	Apa-Igbo akpalata	Apa, kawo,	Apa, podmahogany	Root, leaves, stem bar, seeds	Gonorrhea, stomach disorders, hernia, lumbago, febrifuge, antiemetic

Table 4. Continue

28	<i>Agelaea oblique</i>	Connaraceae	Esura, Okun	Horse tamarind	Leaves	Childbirth (Relaxation of muscles)
29	<i>Agelenopsis chevaleri</i>	Olacaceae	Igo	Agelenopsis, igo	Bark, root, seeds, leaves	Conjunctivitis, ring-worm, impotence, purgative, crawl-crawl, tooth ache, mumps
30	<i>Ageratum conyzoides</i>	Compositae	Imi-esu, ula ujula, urata, ahenhen	Goat weed	Goat weed whole plant, leaves, root	Wounds, ulcers, crawl-crawl, digestive disturbance, diarrhea, emetic, skin diseases, antipyretic, gonorrhoea, sleeping sickness, eye wash 31
31	<i>Alafia barteri</i>	Apocynaceae	Agbari etu	Alafia chewing stick, guinea-fowl's crest	Roots, leaves	Stickle cell anaemia, rheumatic pains, toothache, eye infections
32	<i>Albizia adianthifolia</i>	Leguminosae	Banabana Ayinreta, igbabo, afema, avu, tsintsiya, kurmii	Flatcrown albizia	Bark	Gonorrhoea, night blindness, piles, anthelmintics, cough
33	<i>Albizia ferruginea</i>	Leguminosae	Ayinre ogo, ngu, kurmii	False thorn albizia	Root, stem bark, leaves	Dysentery constipation, fish poison
34	<i>Albizia</i>	Leguminosae	Igbagbo	Silk flower, lebbeck	Seeds, leaves, stem bark	Astringent, mouthwash, river-blindness, gonorrhoea
35	<i>Albizia zygia</i>	Leguminosae	ayinre-weere, kurmii	Okuro, atanza, siris	Bark	Arthritis, sprain
36	<i>Alchornea cordifolia</i>	Euphorbiaceae	Ipa, esinsin, eepa, bambami, ububo	Christmas bush	Leaves, stem, bark, twig	Fever, rheumatism, antimicrobials, diuretic, purgative, toothache, cough, sore, gonorrhoea, insomnia
37	<i>Alchornea laxiflora</i>	Euphorbiaceae	Pepe, Ijan	Three-veined bead string	Stem, leaves	Chewing sticks, venereal diseases, emmenagogue, ring worm, antioxidant, (leaves traditional wraps for cola nuts)
38	<i>Allamanda cathartica</i>	Apocynaceae	Ododo-alamanda	Yellow allamanda, angel's trumpet, buttercup, golden trumpet	Roots	Antimicrobial, malaria, dysentery, cathartic
39	<i>Allanblackia floribunda</i>	Guttiferae	Orogbo erin, egba, nkpu kptiri	Fallow tree	Root, leaves, stem bark, fruit	Malaria, dysentery, toothache, chicken pox small pox, measles
40	<i>Allium ascalonicum</i>	Liliaceae	Alubosa-elewe, albasa maigo	Shallot, sprint onion	Leave, bulb	Convulsion, dysentery
41	<i>Allium cepa</i>	Liliaceae	Alubosa, albasa, yasase, albasa gudaji	Onion	Bulb, leaves	Cough, diuretic, anthelmintics, skin diseases, weak erection, antitumour, rubefacient, throat infection.

Table 4. Continue

42	<i>Allium sativum</i>	Liliaceae	Ayo, ayuu	Garlic	Bulb	Fever, coughs, asthmadilated bronchi, flatulence, anthelmintic, ringworm, antibiotic, diuretic, emmenagogue, antimicrobials, blood tonic, Malaria.
43	<i>Allophylus africanus</i>	Sapindaceae	Eekan-ehoro, alarto, oduoko,	African false current	Leaves, roots bark	Diarrhea, pile, toothache anthelmintics, venereal diseases, cough
44	<i>Aloe barteri</i>	Liliaceae	Eti erin, ida-egun, idaorisa moda.	Aloe	Leaves	Ringworm, anthelmintics, aphrodisiac, amenorrhoea, cough, skin infections, astringent, antit umour, pile, fruits for preventing snake bite,
45	<i>Aloe vera</i>	Liliaceae	Ahon erin	Barbados Aloe	Leaves juice	Purgative, guineaworms, hair care, skin diseases, wound, diabetes, amenorrhoea, breast cancer, immune booster
46	<i>Alstonia boonei</i>	Apocynaceae	Awun, ahun, eghu, akpi	Bark	Root, bark, leaves	Breast development filaria worms, anthelmintics, antidote, malaria fever, yellow fever, anti-periodic
47	<i>Alstonia congensis</i>	Apocynaceae	Stool wood	Whole plant		Malaria, astringent, toothache
48	<i>Altermanthera repens</i>	Amaranthaceae	Dagunro	joy weed	Whole plant	Dysentery, antimicrobials, dysmenorrhoea, filariasis, fracture, joint pains
49	<i>Alternanthera sessilis</i>	amaranthaceae	Reku-reku, maikai dubu	Alternanthero	Whole plant, leaves.	Astringent, antibacterial, boil, headache, antidote to snake-bite
50	<i>Amaralia bignoniflora</i>	Rubiaceae	Unemou		Leaves, seeds	Cough, heart burn, rheumatic pain
51	<i>Amaranthus spinosus</i>	Amaranthaceae	Tele-elegunun, dogunro, manijingasaya, inine ogwu	Prickly amaranthus	Whole plant	Abdominal pain, ulcers, gonorrhoea, astringent, menorrhagia, diarrhea, dysentery, eczema
52	<i>Amaranthus viridis</i>	Amaranthaceae	Tete-abalaye, teteke kere, atite, malan koshi	Green amaranth, slender amaranth	Leaves, roots	Anthelmintics, drysetery, antispasmodic, diuretic, gonorrhoea, eye disease.
53	<i>Ambrosia maritime</i>	Compositae	Matsemama, markarfo		Whole plant	Syphilis, hypertension, antitumour, stimulant
54	<i>Ambrosia maritime</i>	Compositae	Tutu bidi		Leaves	Fever, inflammation
55	<i>Amorphoph allus dracantiode dracantioides</i>	Anacardiaceae	Gwazar glwa, gaadali		Tubers	Asthma, piles, snakebite remedy, arrow poison

Table 4. Continue

56	<i>Ananas comosus</i>	Anacardiaceae	Kasu, kanju, akwe olu, okpokpo	Cashew nut tree	Bark, leaf, fruit	Malaria, elephantiasis, leprosy, ringworms, scurvy, diabetes, warts, anthelmintics typhoid fever, caries.
57	<i>Ananas comosus</i>	Bromeliaceae	ope-oyinbo, ekunkun, ehinahun, abarba, nkwe aba	Pineapple	Unripe fruit, juice, ripe fruit	Digestive problems, typhoid fever, cough, anthelminitics
58	<i>Anchomanes difformis</i>	Araceae	Abirisoko, langbodo, ogirsako, hantsar gada, oje	Acchowmanes	Roots	Diuretics, purgative, gonorrhea
59	<i>Andira inermis</i>	Araceae	Gwaska	Dog almond, bastard mahogany	Bark, seeds	Skin diseases, anthelmintics
60	<i>Aneilema hockii</i>	Commelinaceae	Gododo-funfun		Root	Aphrodisiac, female infertility
61	<i>Annonamuricata</i>	Annonaceae	Sharp-sharp	Sour sop	Leaves fruit	Fever, dysentery
62		Annonaceae	Abo, ibobo, gwandar daji, uburu ocha	African custard apple, gwanda daji	Root, bark, leaves, seeds	Cancer, dysentery, cough, venereal diseases, toothache, astringent, anthelmintic, ease labour, eye drops, tumour out growth, anti-bee sting
63	<i>Annona squamosa</i>	Annonaceae	Sharp-sharp, mbugo ago	Sweet sop, pineapple tree	Leaves fruit, stem	Anaemia dysentery, abortifacient, ulcer, anti-tumour
64	<i>Anogeissus leiocarpus</i>	Combretaceae	Ayin, marike, atara	Axiewood	Bark, leaves	Antipyretic, taeniicide, skin disease
65	<i>Anonidium manni</i>	Annonaceae	Ewuro-igbo		Bark	Diarrhea, cough, sores, fever, rheumatism
66	<i>Anthocleista djalonensis</i>	Loganiaceae	Shapo, kwa	Cabbage tree	Leaves, bark	Skin disease – rashes and eczema, diabetes, antipyretic, purgative, abdominal pain, impotence
67	<i>Anthocleista liebrechtsiana</i>	Loganiaceae	Apa oro, sapo, kwari		Seeds, bark	Purgative, skin infection, antimicrobial.
68	<i>Anthocleista vogelii</i>	Loganiaceae	Abara, apado, agbagba		Latex, bark	Antidote for snake bite, purgative
69	<i>Anthonothea macrophylla</i>	Loganiaceae	Abara, apado, agbagba		Latex, bark	Gonorrhea, dysentery, diarrhea, yellow fever.
70	<i>Antiaris Africana</i>	Moraceae	Ooro, oriro, ayo, farin loko, ojianwu, ajaghadibia	False iroko, ooro, upas tree, black mulberry, bonobo	Stem-bark, root bark, sap	Epilepsy, lumbago, skin irritant, purgative, nervous disorders
71	<i>Antidesma venosum</i>	Euphorbiaceae	Aroro		Stem bark	Anthelmintics
72	<i>Antigonon leptop</i>	Polygonaceae		Coral vine	Leaves	Antimicrobial
73	<i>Antrocaryon micraster</i>	Anacardiaceae	Ifa-okete, egin-agbo		Leaves	Antimicrobial

Table 4. Continue

74	<i>Apium graveolens</i>	Apiaceae	Seleri-saladi	Celery	Whole plant	General toxic, laxative, cough, stomachache
75	<i>Arachis hypogea</i>	Leguminosae	Epa	Groundnut, peanut	Nuts	Oil as solvent, antimicrobials, insomnia
76	<i>Arecacatechu</i>	Palmae		Betel nut	Nut	Uninary tract infection, aphrodisiac, anthelmintic, astringent, carminative.
77	<i>Argemone maxicana</i>	Papaveraceae	Ekan-ekun, egunarugbo	Mexican poppy, prickly poppy	Whole plant, latex, roots, seeds	Jaundice, gonorrhoea
78						

1.5	<i>L.fluitans</i>	<i>Sagittaria</i>	(<i>Lophotocarpus</i>)	8.4	<i>C. submicrolepis</i>	11.3	<i>Spirodela polyrrhiza</i>		
	<i>guayaneisis</i>			8.5	<i>Scripus cubensis</i>	12.	LENTIBULARIACEAE	8	
	<i>Wiesneria schweinfurthii</i>			9.	GRAMINAE (POA CEAE)	12	12.1	<i>Ultricularia reflexa</i> (= <i>Charoidea</i>)	
2.	ARACEAE	1		9.1	<i>Echinochola colonum</i>		12.2	<i>U. gibba</i> subsp. <i>Exoleta</i>	
2.1	<i>Pistia stratiotes</i>			9.2	<i>E. pyramidalis</i>		12.3	<i>U. inflexa</i> var. <i>inflexa</i>	
3.	AMARYZIDACEAE	1		9.3	<i>E. stagnina</i>		12.4	<i>U. reflexa</i> (= <i>platytera</i>)	
3.1	<i>Crinum natans</i>			9.4	<i>Leersia hexandra</i>		12.5	<i>U. rigida</i>	
4.	APONOGETOMA CEAE	2		9.5	<i>Leptochola cacrulescens</i>		12.6	<i>U. vitellanis</i>	
4.1	<i>Aponogeton subconjugatus</i>			9.6	<i>Oryza longistaminata</i>		12.7	<i>U. inflexa</i> var. <i>inflexa</i> (= <i>thonningii</i>)	
4.2	<i>A. vallisnerioides</i>			9.7	<i>O. perennis</i>		12.8	<i>U. beUaminiana</i> (= <i>villosula</i>).	
5.	AZOLLACEAE	1		9.8	<i>Phragmites karka</i>		13.	MARANTACEAE	1
5.1	<i>Azolla africana</i>			9.9	<i>Rhytachne triaristata</i>		13.1	<i>Thalia geliculata</i>	
6.	CERATOPHYLLACEAE	1		9.10	<i>Sacciolepis africana</i>		14.	MENYANTHACEAE	1
6.1	<i>Ceratophyllurn demersurn</i>			9.11	<i>Sorghum arundinaceum</i>		14.1	<i>Nymphoides indica</i>	
7.	CONVOLVULACEAE			9.12	<i>Vossia cuspidate</i>		15.1	MIMOSACEAE	2
7.1	<i>Ipomoea</i>			10.	HYDROCHARITACEAE	2	15.2	<i>Mimosa pigra</i>	
7.2 l.	<i>Asarfolia</i>			10.1	<i>Ottelia ulvfolia</i>		15.2	<i>Neptunia oleracea</i>	
8.	CYPERACEAE	5		10.2	<i>Vallisneria spiralis</i>		16.	NAJADACEAE	1
8.1	<i>Cyperus alopecuroides</i>			11.	LEMNACEAE	3	16.1	<i>Nijas horrida</i>	
8.2	<i>C. articulatus</i>			11.1	<i>Lemna aquinoctialis</i>				
8.3	<i>C. exaltatus</i>			11.2	<i>L.perpusilla</i>				

17.	NYMPHAEACEAE	1
17.1	<i>Nymphaea lotus</i>	
17.2	<i>N. maculata</i>	
17.3	<i>N. micrantha</i>	
17.4	<i>N. guineensis</i>	
18.	ONAGRACEAE	5
18.1	<i>Jussiaea repersvar. dffusa (= Ludwigia stolonifera)</i>	
18.2	<i>Ludwigia decurrens</i>	
18.3	<i>L. erecta</i>	
18.4	<i>L. leptocarpa</i>	
18.5	<i>L. suffruticosa</i>	
19.	PARKERIACEAE	1
19.1	<i>Ceratopteris cornuta</i>	
20.	PODOSTEMONACEAE	2
20.1	<i>Tristicha hypnoides</i>	
20.2	<i>T. trifaria</i>	
21.	POLYGONACEAE	3
21.1	<i>Polygonum langigerum</i>	
21.2	<i>P. selicifolium</i>	
21.3	<i>P. seregalense</i>	
22.	PONTEDERIA CEAE	4
22.1	<i>Eichornia crassipes</i>	
22.2	<i>E. natans</i>	
22.3	<i>E. diversifolia</i>	
22.4	<i>Heteranthera callifolia</i>	
23.	POTAMOGETONACEAE	2
23.1	<i>Potamogeton octandrus</i>	
23.2	<i>P. schweinfurthii</i>	
24.	RUBIACEAE	1
24.1	<i>Mitragyna inermis</i>	
25.	SALVINIACEAE	
25.	<i>Salvinia nymphellula</i>	
26.	SCROPHULARIACEAE	
26.1	<i>Limnophila barteris</i>	
27.	SPENOCLACEAE	
27.1	<i>Sphenodea zehyanica</i>	
28.	TRAPACEAE	1
28.1	<i>Trapa bispinosa</i>	
29.	TYPHACEAE	
29.1	<i>Typha australis</i>	
	Total Species	76

Utilization of Aquatic Plants in Nigeria

Aquatic Plants, Fish and Wild Life

Aquatic plants play an important role in the life cycle of fish. Some plants, for example, *Lenna pausicostata* are eaten directly (Mbagwu and Adeniji., 1988), while other fish species feed on epiphytic algae growing on the surfaces of aquatic plants. Various species of game birds, waders and other avian migrants commonly sighted on Nigerian lakes use the aquatic plants as nesting sites and as a source of food.

Aquatic Plants as Fertilizers

Aquatic plants accumulate large quantities of nitrogen and phosphorus in their tissues. They will therefore improve soil if applied as soil additives (Obot, 1988).

Aquatic Plants as a Source of Energy

The utilization of aquatic plants for energy centers mainly on its use as fuel for fish smoking and for domestic energy. In Nigeria, stems of *Aschynomene crassicaulis*, *Echinochloa* spp and *Cyperus papyrus* among others are used as fuel especially for cooking and fish smoking (Kio and Ola – Adams, 1987).

Industrial Uses of Aquatic Plants

Aquatic plants offer a wide range of materials that could serve the needs of innovative industry. The material could be used for construction, matting, bedding and pulp/paper. The mature silky inflorescences of the spike of *typha australis* for example, are used in stuffing pillows and mattresses and the fragrant dry tuber of *cyperus maculatus* is sold in Northern Nigeria as perfume. Another source of perfume is the wider ground stems of *cyperus articulatus*, whose leaves are burnt over the fire as a mosquito repellent, and aerial stems are used in the weaving of colorful mats commonly sold in the North of Nigeria. *Vossia cuspidata*, *Cyperus papyrus* and *Eichornia Crassipes* have economic potential for pulp, paper and fibre (Kio and Ola – Adams. 1990).

Aquatic Plants as a Source of Food, Fodder and Medicine

The most widely known aquatic plant used as food is the floating rice (*Orizasetiva*). For example, the seeds, of *burgu (Echinocholastagnina)* are collected for food in Monai on the western shore of Lake Kainji. The seed of *Echionocholastagnina* is also an important food item for fishermen in the inner Delta of the Niger River.

Kio and Ola — Adams (1987) reported that the rhizome, floral receptacle and fruits of *Nymphaealatus* (water lily) are either eaten raw or cooked for food and *Ludwigia stolonifera* is used as an ingredient of soup in the Yelwa area of Kebbi State (Obot and Ayenji, 1987).

Several varieties of aquatic plants are also used in curative therapy in traditional communities. A good number of the ethno-botanic materials may thus yield compounds which could be used as modern drugs and pharmaceuticals. For example, Kio and Ola — Adams (1987), reported that *Polygonum senegalense* is pounded with nature hydrated sodium carbonate and rubbed on the limbs for rheumatic and other swellings. This concoction is

also applied to syphilitic sources. *Althernatheranodiflora*, on the other hand, is used for simple stomach disorders and *Pistiastratiotes* is used for ulcerative conditions of the mouth and tongue. Obot and Ayenii (1987) report that *Pistiastratiotes* is used as part of a concoction for the treatment of flu. The emergent nitrogen — fixing legume *Neptoniaoleracea* is used in the treatment of yellow fever and Guinea worm infection.

Recreation, Aesthetics and other Uses

There are aquatic plant species of great potential in horticulture and recreation of greater potential. Some members of the family Orichidaceae such as *Eulophiscaricifolia*, *Eulophinahorsfallii*, and *Eulophisangolesis*. smaller aquatic plants such as *Najes* spp. may also be used in the aquarium as ornamentals and as agents of aeration. The presence of aquatic plants has favored the possibilities of most Nigerian water — bodies being developed into recreation centers that will include sport, hunting, fishing, bird watching, nature photography e.t.c.

In small notes, plant resources make up an important contribution to the food and nutritional needs of man from ancient times. Plants provide a regular income to the economy of any country and Nigeria is not an exception; they help to supply fruits, nuts, medicines, housing materials, recreations, raw materials for commerce and industries, scientific research, and a host of others. Findings revealed that plant resources have economic (Commercial) substance; cultural, medicinal values etc. and constitute a great asset of their livelihood support. About 60% of the population depends entirely on plants for a living.

For centuries, plants have been one of the most useful natural resources in the world. Even today plants are one of the most important materials people use for building houses, making clothes, cooking and heating. Nearly all of our food comes from plants. Perhaps, this could be the reason for the popular saying that; “**all flesh comes from grass**”. Useful products such as rope and burlap are also made from the fibers of plants. A large number of widely used drugs, including medicines such as aspirin come from plants. It is therefore impossible to think about an environment without plants. Plants create the basic for most environments. Over the past few decades, people have begun to think more about the important relationship plants have to people, animals and the overall health of the environments.

The plant genetic resources of Nigeria according to Cibile and Adesina (1986), are a variable source of pharmaceuticals and therapeutics though the plants are not adequately documented. Nigeria is blessed with abundant ethno medicinal resources. The need to study medicinal plants, according to Lallto (1978) cannot be overemphasized for a vista of reasons including inter alia

widespread use of plants in folk medicine; rescoring traditional medicinal plants and knowledge about them from imminent loss as well as the need for health for all.

Medicinal plants are generally scattered in various families of angiosperms, gymnosperms, pteridophytes, bryophytes and thallophytes (Obot, 1988). Partrick (2005) stated that in Nigeria; indigenous ways of using medicinal plants makes sense because it fits into the political and economic situations of the people's particular cultural environment. According to Isichei (2005), basically, it is the performance of plants and chemical composition purposes. Our human evolution has been so closely tied to plants that it is difficult to imagine human existence without them. In all life on earth, plants are the only producers and all consumers are dependent upon plants for food, fiber, wood, energy and oxygen. Knowledge of plant, their habitats, structure, metabolism and inheritance is thus the basic foundation for human survival.

Plants form the bedrocks of life, being the first generators of oxygen in to the atmosphere that characterized the early earth plants are thus the roots of life and human material and culture depends on them. People rely on plants for much more than food and shelter and people are plants in so many ways that there are a few areas of human endeavor in which they do not play an important role.

REFERENCES

- Adenyi HA, Mbagwu IG (1990). Study Of Physio-Chemical Characteristics Of Some Heavy Metals In Jakara Reservoir; Kano State, Nigeria. Nifrr Annual Report.
- Adjanahoun E, Ahiyi MRA, Ake — Assi L, Dramane K, Elewude JA, Fadoju SO, Gbile ZO, Goudote E, Johnson CLA, Keita A, Morakinyo O, Oyenole JAO, Olatunji OA, Sofowori E.A (1993). Traditional Medicine And Pharmacopoeia: Contribution To Ethno Botanical And Flonstic Studies In Western Nigeria, O.A.U Scientific, Technical And Research Commission, Lagos.
- Adrian D, Bell (1991). Plant form: An Illustrated guide to Flowering plant morphology. Oxford University Press. Oxford.
- Anon (1986). A National Conservation Strategy For Nigeria Ncf. Pp. 75.
- Anton; M., Kofraick, Hudson T. Histman, Vincent G. Babutzky, William J. Flocker . Plant Science. 2' Edition Growth Development And Utilization Of Cultivated Plants United States Of America Press. Pp 8 – 12
- Anwana ED, Obot EA (2003). Ethnobotany of Human settlements in Cross River National Park, Okwang Division: Useful and Medicinal Plants Roan 1 (182), 34 – 45.
- Balick MJ, Cox PA (1996). Plants, People and culture. The Science of Ethnobotany. Scientific American Library New York.
- Banks HP (1970). Evolution Of Plant Of The Past (Fundamentals Of Botany Series). Belmont, Californs Wadsworth Publishing Company Inc.
- Barkil HM (1997). The Useful plants of West tropical Africa .Ed Vol.1 families A. A Royal Botanic Gardens Kew .Pp 435.
- Berrie A, Berrie GK, Eze JMO (1987). Tropical plant science Longman House. Burnt Hill, Halow England press.
- Bold HC, La Claie JW (1987). The plant kingdom prentice- Hall mc, England Chifis Nigeria.
- Brummit RK, Powell CE (1992). Authors of Plant Names, A List of Authors of Scientific Names Of Plants With Recommended Standard Forms Of Their Names Including Abbreviations. Royal Botanic Garden. Kwe U.K.

- Chrispeels MJ, Sadava D (1977). 'Plants Food and People Freeman And Co-San Francisco.
- Cibile ZO, Adesina (1986): B Nigeria flora and its pharmaceutical potentials. *Journal of Ethnopharmacol.* 19:1-16.
- Clark Lynn (2004). primary root Structure and a development. Oxford University press.
- Cronquist Author (1988). the evolution and classification of flowering plant. 2nd edition. New York Botanical Garden Bronx.
- Dans PH, Heyword VH (1963). Pinaples of Angiosperm Taxonomy. Van Nostrand, Prince Timo N.J.
- David M, Sponer Blikhet LA, Hetttscheid RG, Van Den Barg, Blillhan AB (2003). PLANT Nomenclature and Taxonomy, an Horticultural and Agronomic Perspective. Horticulture Remains Vol 28. John Wiley and Sons Inc Pp 1-60.
- DE Conolle ALPP (1867). Lois De La Nomenclature Botanique, J.B Bailliereet. Files, Paruis
- Elias, Thomas S. (1980). The Complete Trees of Noth America. Field Guide and Natural History Van Nostrand Rainhold CO. New York.
- Evans LY (1998). Feeding The Billion: Plants And 'Population Growth Cambridge University Press. Paperback Pp247.
- Farnsworth NR, Akerelle, Binge AS (1988). Medical Plants in Therapy Bill. W.H.O. 63, 965-98 1.
- Federal Environmental Protects Degency (FEPA) (1992). Biological Diversity in Nigeria A Country Stud The Federal Environmental Protection Agency, The Presidency, Abuja.
- Gordian C, Oute, Godswill OA (2007). Chemical detection in plant used for folk medicine in Sout5h Easter Nigeria. *Ethnobotanica*; leaflets 11:173-194.
- Ideja NP (1977). A New Geography of Nigeria! Merbore, A.M.A. and Bokare, O. (1974): Pe-Impoundment Studies of The Swamps In Lake Kainji Basin The African Journal Of Tropical. Hydrol and Fish 3: 79-93.
- Idu M, Olovinfemi DF (2000). Plant Used For Medicinal Purposes By The Kome People Adanaws State Nigeria. *Indigenous Knowledge and Maintain* 8 (3): 18.
- International Union For Conservation Of Nature And Natural Resources (IUCN) Species Survival Commission (2004). IUCN Red List of Threatened Species.
- Ischei AO (2005). The Role of plat Resources in Nigeria's Economic recovery Ajude. *Nigeria Journal of Botany* Vol 18:1-22.
- Iswuni MA (1993). The Common Edible Fruits of Nigeria Part li Nigeria Field 58:157-179.
- Joseph E, Armstony Knight D (1981). plant taxonomy 135c 33' Ordering the world: A history of classifying Burnette Books London ppl6-17.
- Karachi (2006). importance of Medicinal plant highlighted (2006) retrieved June l8t from <http://www.decom.Con12006/1/07/loval l4htm>.
- Kaufman PB, Cerlson TT, Dayananden R, Evans ML, fishe JB Parks wells JR (1989). Plant the biology and importance. Herper and Row publishes, New York.
- Kio PRO, Ola Adams BA (1990). Utilization and development of wetlands, in T.V.A Akpato UNESCO! MAB, Pot-Harcourt pp 48-54.
- Kunjani J, Ananda R- Joshi (2006). Ethnobotanical plants use for Dental and oral health care in the Kah Gandeki and Bagmeh Watersheds Nepal.
- Kutama AS (2012). studies on the eoidemiology and control of sorghum head and loose smuts in the sudan savanna region of nigeria. PhD Thesis, Department of Plant Biology, Bayero University, Kano.
- Kutama AS, Aliyu BS, Emechebe AM (2009). A Survey of Sorghum Downy Mildew in Sorghum in the Sudano-sahelian Savanna Zones of Nigeria. *Bayero Journal of Pure and Applied Sciences* 2(2):218-222. ISSN-2006-6996
- Leopold, A and P. Kredemann (1975). Plant growth and development. New York. McGraw- Hill.
- Lincoh Box shall, Clark (1998). A dictory of ecology, evolution and systematics, 2rd eds Cambridge University Press Cambridge. M.A.
- Mers A (1989). Plant Taxonomic Interactive. Bibliographic Guide. Chadwyck Healy London.
- Mhagrow IG, Adanijin HA (1988). The Nutritional Content Of Deuckweed (Lmis Pausicsteto Hegeim) In Kainji Area, Mjens, N1ffil, Arw Report.
- Michael A (2003). What is the evolutionary history of plants? Conjecture corporation Wise Grek publishes.
- Milani JP (1987). Biological Science: An Ecological Approach (6th EDS) Kendall/Kunt Publishing Company Iowa.
- Morakinye AB (1994). Commonly forestry in the support zone of the cross River National Park Nigeria field 59:95-104.
- Nair, R, KDANJA t; Chands 5 (2005): Antibacterial activity of some selected Indian Medicinal flora Jurk J. Biol. 29:41-47.
- Naqui, S.H.Z. (1975): plant and Man: Inaugural lecture delivered at the University of Lagos.
- Nigeria Student's Enydopedia (NSE) (2009). Plant Briitannica Publishers.
- Obot EA, Ayenji JSO (1987). A handbook of common aquatic plants of the Kainji lake Basin Nigeria, Kainji Lake Research Institute. SAOLOG printing production Illorin.
- Obot EA, Mbagwu IG (1988). Macrophyte Flora of The Newly Impounded Jebba Lake Nigeria Afri. J. Ecoli. 24 (3)> 195-198.
- Odunaya CA (2005). World plant for medicinal and culinary use Nigeria. Dept of plant science faculty of Agric Obafemi Awolowo University Ile-ife Nigeria.
- Okafor JC (1993). Lost crops of Nigeria an overview pp 2-32, in Lost crops of Nigeria; implication for food security J.A. Okajie and D.V.U Okah editors University of Agriculture Abeokuta.
- Okafor JC, Ham (1999). Identification, Utilization et al conservation des plants medicinale africaine, Nuner 3; Juillet 1999.
- Okali DUU, Ole – Adams BA (1987). Tree population changes in treated rainforest at Omo Forest Reserve, Nigeria *Journal of Tropical Ecology* 3: 291 – 313.
- Okojie JA, Okali DUU (1993). Editions, Last crops of Nigeria; Implications F. Food Security – University of Agriculture; Abeokuta.
- Ole – Adams BA (1986). Germplem Conservation in Forestry, Invited Paper Presented at the 13th Annual conference in Genetic resources of Nigeria. 10 — 14 Feb. 1986. FRIN; Ibadan.
- Ole – Adams BA, Land IDE (1977). Conservation Natural Vegetation in Nigeria. *Environmental conservation* 4:217 — 226.Patrick Inegbu (2006): Knowledge of Herbal Resource and Development of Parishioners in Nigeria Society, Alherto. Canada
- Purves (1994). Life: The science of biology 4th Edition by Sinaver associates and Id. H Freeman.
- Robbins Id. H, Ideier TE (1965). Botany: Plant Science 3 edition Wiley international. New York Pp 10 – 11.
- Robert B (1930). Plant names — a basic Introduction Published in Flora of Australia W/17A Pp 505.
- Roger P (2007). The Origin of Plants. Lang-man Oxford University Press Pp. 246.
- Sarojini TR (2005). Mordern Biology, for Seiwi Secondary School, 3rd edition. African first Publishers Limited Pp 5 – 6.
- Sreuter WJ, Mane FR Barrie HM, Burdeif V, Demoulin TS, Filgueran DH, Nicolson PC, Silva JE, Skog P, Trehance NJ, Torland, Hawkswork DL (2000). International Code of Botanical Nomenclature (St Luois Code). Leds and Conpilers) Regnum VG 138:1-474.
- Staffeu PF (1971). Linnaeus and the Linnaeans Regnum Veg. 79: 1 – 386.
- Steam WT (ed) (1953). International code of nomenclature for cultivated
- Stebbins GL (1956). Taxonomy and the evolution of Genera with Special reference to the family Gramineae *Evolution* 10: 235 — 245.
- Stephen PB (1980). The evolution of plants Tale New Haven leader Institute U.K.
- Steven PF (1998). What kind of classification should the practicing taxonomist use to be saved? Pp 295 – 319.
- Stevessy T.F (1990): Plants taxonomy. The systematic evolution of comparative data. Columbia Univ. Press New York.
- Traven PH, Ray of Event, Susen EE (2005). Biology Plants 7th edition.