





ORIGINAL RESEARCH ARTICLE

Checklist, Diversity and Abundance of the Flora in some Selected Local Government of Zamfara State, Northwestern Nigeria.

Isyaku Abubakar¹, Bello Bello Musawa^{2*}, Khalid Tukur³,
Nura Maiakwai Salah⁴ and Mustapha Sani Muhammad⁵.

¹Biotechnology Advanced Research Centre, Sheda Science and Technology Complex, P.M.B 186, Garki, Abuja, Nigeria.

^{2,3,5}Department of Science Laboratory Technology, Federal Polytechnic Kaura-Namoda, P.M.B 1012 Zamfara State, Nigeria.

⁴Department of General Studies, College of Agriculture and Animal Science Wurmo, Sokoto State Nigeria.

ABSTRACT

Check list of the flora in some selected Local Governments of Zamfara State, Northwestern Nigeria, was studied. The objective of the study was to provide a comprehensive checklist document and evaluate the diversity and abundance of floral species in the study area. A field inventory of floral species was adopted for data collection. The result showed a total of 306 species belonging to 229 genera within 58 families represented in the study area. The result showed that twenty-six families consist of only 1 species each, eight families have 2 species each and five families have 3 species each, two families have 4 species each while the other families consist of 5 species, 6 species 7 species, 9 species, 14 species 24 species and 86 species respectively. Of these, the family Fabaceae has the highest number of species, 86 occurring in all the study areas, followed by Asteraceae and Euphorbiaceae with 24 each. This result reveals a high rate of degradation of the remnant flora species as a result of human activities, habitat conversion into residential areas (urbanization), and expansion of Farmland. It's recommended that State Government management and the entire communities pay attention to conservation planning and management activities that will take ecological implications into consideration. More research should be conducted on the identified species in order to ascertain their morphological, anatomical, ethnobotanical and economic importance.

ARTICLE HISTORY

Received August 11, 2023.

Accepted September 29, 2023.

Published September 30, 2023.

KEYWORDS

Checklist, Flora, Conservation.



© The authors. This is an Open Access article distributed under the terms of the Creative Commons Attribution 4.0 License (<http://creativecommons.org/licenses/by/4.0>)

INTRODUCTION

Nigeria is the richest country in the African continent in terms of biodiversity (Adeyemi and Ogundipe, 2012; Adewuyi, 2012 and Pelemo *et al.*, 2011). It is naturally blessed with different types of vegetation, as almost all the vegetation types that exist in other African countries are found abundantly distributed in different parts of the country. This is favored by the variations in climate and geographical features. The destruction of many plant species due to human activities, such as deforestation, construction of roads, urbanization, and industrialization, is depleting the world's genetic resources and is putting man's heritage of biodiversity under serious threat (Soladoye *et al.*, 2005; Nodza *et al.*, 2014, Kabiru 2008). However, these plant species are under threat from advancing civilization and other unsustainable human activities, and the attitude of the populace towards conservation is relatively poor, thereby resulting in an inevitable loss of genetic resources at all levels. Conservation of biodiversity is supposed to be an intrinsic responsibility for all mankind (IUCN, 2010). In 2010,

Nigeria had 9 million hectares of forest, 336,000 hectares of which were primary forest (F.A.O. 2010). However, the existence of this forest is in doubt (Batta *et al.*, 2013; Pelemo *et al.*, 2011 and Ladipo, 2010) have lamented the rate of deforestation in the country, which is estimated at 3.5% per year, translating to a loss of 350,000–400,000 ha of forest land per year and entire Nigeria's forest land area now is about 10%, which is well below F.A.O.'s recommended national minimum of 25%.

Savannas occupy about 20% of the land surface of the world and about 40% of Africa (Pelemo *et al.*, 2011). In Nigeria, as in many areas in Africa, savanna woodlands provide valuable environmental services, are a critical haven for native biodiversity, and protect soil and water resources against degradation. However, while the pursuit of economic and social exploitation of forest resources has contributed to development in both rural and urban communities in the country, the manner in which it has sometimes been done has led to a decline in forest

Correspondence: Bello Bello Musawa. Department of Science Laboratory Technology, Federal Polytechnic Kaura-Namoda, P.M.B 1012 Zamfara State, Nigeria. ✉ bbmusawa004@gmail.com. Phone Number: +234 803 656 9616.

How to cite: Abubakar, I., Bello, B. M., Tukur, K., Maiakwai, N. S., & Sani, M. M. (2023). Checklist of the Flora in some Selected Local Government of Zamfara State, Northwestern Nigeria. *UMYU Scientifica*, 2(3), 153 – 164. <https://doi.org/10.56919/usci.2323.021>

environmental quality (Alamu and Agbeja, 2011). As a result, the forest-savanna of northern Nigeria continues to experience major biophysical environmental degradations as a result of human anthropogenic activities closely associated with such as commercial and artisanal logging, large-scale land conversion, overexploitation, urbanization, industrialization fuel wood and charcoal production, slash and burn agriculture, grazing, harvesting of non-timber forest products, hunting and mining, overgrazing, inappropriate clearing techniques and unsuitable land-use practices have resulted in severe plant nutrient decline and decrease in productivity (ISRIC, 2007; Ariwaodo *et al.*, 2012a; Jimoh *et al.*, 2013). Hence, the preservation and conservation of this forest ecosystem are of paramount importance not just for the sake of the production of commodities but also for maintaining its ecological balance and environmental reasons (IUCN 2012; Jing-wei *et al.*, 2011).

In Nigeria, for instance, there is limited accurate data on flora composition. Thus, species currently perceived as abundant might actually be endangered, while those previously perceived as endangered might be nearing extinction (Musawa *et al.*, 2019; Soladoye *et al.*, 2011; Ikyagba *et al.*, 2015; Nodza *et al.*, 2014; Soladoye *et al.*, 2015). The knowledge of the flora of a community will enable inhabitants to positively relate with the plant species as well as promote the diversity and sustainable management of the flora. Therefore, the objective of this research work is to provide a comprehensive checklist and documentation of the entire floral diversity of Zamfara State.

Study Area

Zamfara State is located in the northwest geo-political zone. The state capital is Gusau, with major towns such as Kaura Namoda, Talata Mafara, Gummi and Tsafe. Zamfara State has an area of 33,764.9 square kilometres, with a population of 3,259,846 in the 2006 census. There are 14 Local Government Areas. Zamfara State lies within the hot/dry semi-desert climate type. It has two clearly distinct seasons, the wet and dry, with two interfacing minor seasons. The dry season, lasting between November and March, is characterized by very hot/dry conditions, during which rain may not fall, with afternoon temperatures ranging between 30°C and 40°C. At night, the temperature drops to between 14°C and 20°C due to rapid radiation resulting from cloudless skies. This gives the characteristics wide diurnal range typical of this climate. Most of the Zamfara State lies in the Sudan savanna zone, with its southern portion extending into the Northern Guinea Savanna zone. Zamfara State is located in the Sudan Savanna zone, whose vegetation, under the natural conditions as in the forest reserves, consists predominantly of grasses and scattered trees, including shrubs and herbs.

Therefore, for the purpose of this research, three Local Governments were selected, i.e. Maru, Gusau and Kaura Namoda Local Government

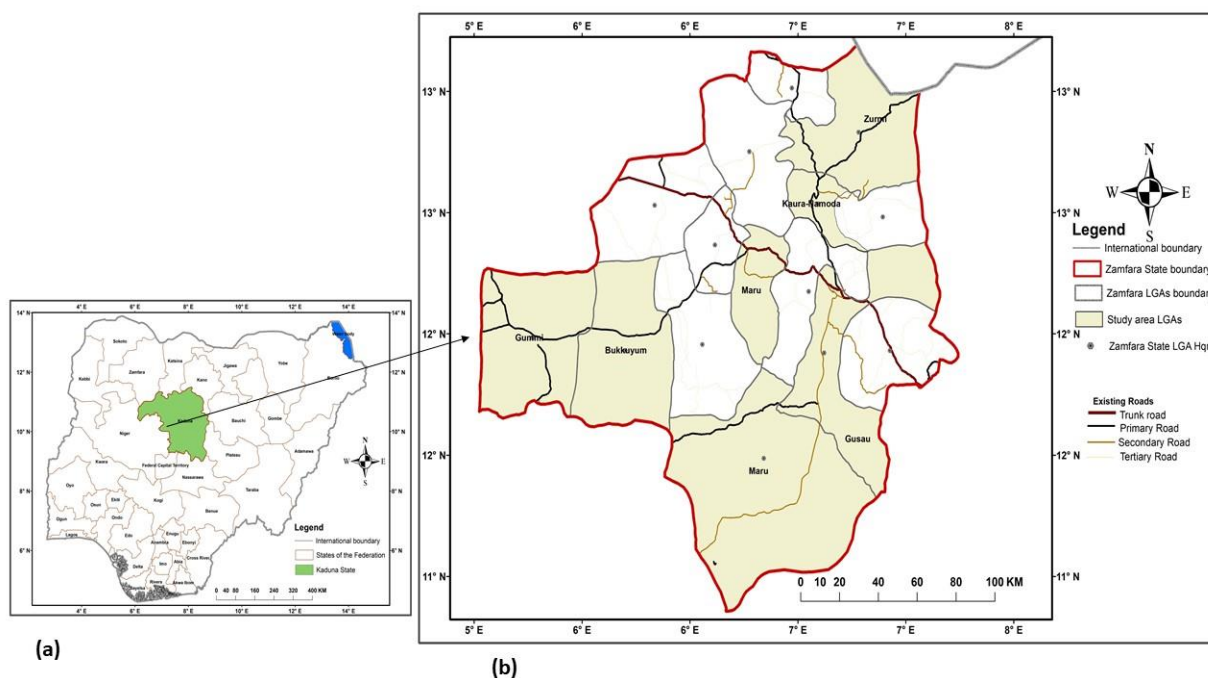


Figure 1: Map of Zamfara State showing the study areas

Species identification

The survey involved repeated visits to the study area to ensure that nearly all existing plant species were recorded.

This was embarked upon for two (2) seasons (January 2021 – January 2023) to ensure that the two weather seasons (rainy and dry) are considered. Floral species were

collected and identified in the field using taxonomic keys provided by Hutchinson *et al.*, (1954, 1958, 1963, 1968 and 1972), Giardina *et al.*, (2007); Romando and Domina (2010) Trees of Nigeria (Keay 1989). The species collected were transported to the Biology Department, Umaru Musa Yaradua University Katsina and compared with herbarium specimens to validate the names. The nomenclature of the species follows Hutchinson and Dalziel (1972). All scientific names were also checked and verified by the International Plant Name Index (IPNI) website (<http://www.ipni.org>) and Plant of the World Online (POWO).

RESULTS

A total of three hundred and six (306) species in fifty-eight (58) families and two hundred and twenty-nine (229) genera were recorded across the three Local Governments studied (Table 1). These species cut across five (5) different plant lifeforms/habits. Families Fabaceae, Asteraceae, Euphorbiaceae, Malvaceae and Poaceae had

the highest species diversity with 96, 24, 23, 17, and 9 respectively. Other important families include Cambretaceae, Convolvulaceae and Cucurbitaceae, with 7 species each. Acanthaceae, Anacardiaceae, Arecaceae, and Liliaceae had 6 species each. Other prominent families include Amaranthaceae, Apocynaceae, Moraceae, and Solanaceae, with 5 species each. Anonaceae, Asclepiadaceae, and Verbinaceae had 4 species each. Meliaceae, Rubiaceae, Rutaceae, Sapindaceae, Sterculiaceae, and Zingiberaceae were represented with 3 species each. Amaryllidaceae, Burseraceae, Cochlospermaceae, Cyperaceae, Ebenaceae, Lamiaceae, Loranthaceae, and Nyctaginaceae with 2 species each. Aizoaceae, Balanitaceae, Brassicaceae, Capparidaceae, Caprifolaceae, Caricaceae, Cleomaceae, Connaraceae, Dichapetalaceae, Flacourtiaceae, Labiaceae, Lecythydaceae, Loganiaceae, Lycopodaceae, Lythraceae, Martyniaceae, Moringaceae, Myrtaceae, Nymphaeaceae, Opilliaceae, Oxalidaceae, Portulacaceae, Sapotaceae, Teraceae, Zygophyllaceae were represented with 1 specie each (figure 1).

Table 1: List of the species of plant collected in Zamfara state.

Family	Species	Local name	Lifeform/Habit
Acanthaceae	<i>Nelsonia canescens</i> (Lam.)		Herb
Acanthaceae	<i>Asystasia calycina</i> Benth.		Herb
Acanthaceae	<i>Hypoestes forskaealii</i> (Vahl).		Herb
Acanthaceae	<i>Phaulopsis falcisepala</i> C.B. CL		Herb
Acanthaceae	<i>Hygrophila auriculata</i> Schumach.	Kayar rakumi	Herb
Acanthaceae	<i>Phaulopsis barteri</i> T.Anders		Herb
Aizoaceae	<i>Zaleya pentandra</i> (L.) C. Jeffrey	Gadon maciji	Herb
Amaranthaceae	<i>Amaranthus viridis</i> L.	Alayyahu	Herb
Amaranthaceae	<i>Achyranthes aspera</i> L.	Hakorin maciji	Herb
Amaranthaceae	<i>Alternanthera selsilis</i> (L.) DC	Ke kai dubu	Herb
Amaranthaceae	<i>Philoxerus vermiculatus</i> R.Br.	Fara layatu	Herb
Amaranthaceae	<i>Amaranthus spinosus</i> L.	Zarangade	Herb
Amaryllidaceae	<i>Crinum jagus</i> (J. Thomps. Dandy)	Albasar kwadi	Herb
Amaryllidaceae	<i>Allium sativum</i> L.	Tafarnura	Herb
Anacardiaceae	<i>Sclerocarya birrea</i> (A. Rich.) Hochst	Danya	Tree
Anacardiaceae	<i>Anacardium occidentale</i> L.	Yazawa	Tree
Anacardiaceae	<i>Haematostaphis barteri</i> Hook.f.	Jan danya	Tree
Anacardiaceae	<i>Mangifera indica</i> L.	Mangwaro	Tree
Anacardiaceae	<i>Heeria insignis</i> (Del.) O. Ktze	Kasheshe, hawayen zaki	Herb
Anacardiaceae	<i>Spondias purpurea</i> L.		Tree
Annonaceae	<i>Anona squamosa</i> L.	Gwandar daji	Tree
Annonaceae	<i>Cleistopholis patens</i> (Benth.) Engl.		Tree
Annonaceae	<i>Hexalobus crispiflorus</i> A. Rich.		Tree
Annonaceae	<i>Monodora myristica</i> (Gaertn.)	Gujiyar dan miya	Tree
Apocynaceae	<i>Calotropis procera</i> (Aiton) W.T. Aiton	Tunfafiya	Shrub
Apocynaceae	<i>Anisopus manni</i> N.E.Br.	Sakayau	Herb
Apocynaceae	<i>Cryptostegia grandiflora</i> Roxb. ex R. Br		Shrub
Apocynaceae	<i>Funtumia elastica</i> (Preuss) Stapf		Tree
Apocynaceae	<i>Landolphia owariensis</i> P.Beauv.	Ciwo	Tree
Arecaceae	<i>Borassus aethiopicum</i> Mart.	Giginya	Tree
Arecaceae	<i>Cocos nucifera</i> L.	Kwakwa	Tree
Arecaceae	<i>Hyphaene thebaica</i> (L.) Mart.	Goriba	Tree
Arecaceae	<i>Phoenix dactylifera</i> L.	Dabino	Tree
Arecaceae	<i>Areca catechu</i> L.		Tree
Arecaceae	<i>Elaeis guineensis</i> Jacq.	Kwakwar manja	Tree
Asclepiadaceae	<i>Leptadenia hastata</i> (Pers)	Yadiya	Herb

Asclepiadaceae	<i>Caralumma dalziella</i> N.E. Br.	Karan masallaci	Herb
Asclepiadaceae	<i>Aslepias curassavica</i> L.	Rizgar kurege	Shrub
Asclepiadaceae	<i>Gymnema sylvestre</i> R.Br		Shrub
Asteraceae	<i>Centaurea perrottetii</i> DC	Surandi	Herb
Asteraceae	<i>Acanthospermum hispidum</i> D.C	Yawo	Herb
Asteraceae	<i>Alternanthera pungens</i> H.B.K		Herb
Asteraceae	<i>Baccharoides Adoensis</i> (Sch. Bip. ex Walp) H. Rob.	Kumbura fage	Herb
Asteraceae	<i>Bidens pilosa</i> L.		Herb
Asteraceae	<i>Chromolaena odorata</i> King & Robinson		Herb
Asteraceae	<i>Vernonia strummambigum</i>	Tattaba	Herb
Asteraceae	<i>Vernonia amygdalina</i> Del.	Shuwaka	Herb
Asteraceae	<i>Vernonia cinera</i> (L.) Less.		Herb
Asteraceae	<i>Achillea millefolium</i> L.		Herb
Asteraceae	<i>Ambrosia maritima</i> L.	Kaikayi	Herb
Asteraceae	<i>Chrysanthelium indicum</i> L.	Ganshin gona	Herb
Asteraceae	<i>Erigeron canadensis</i> L.		Herb
Asteraceae	<i>Elephantopus scaber</i> L.		Herb
Asteraceae	<i>Emilia coccinea</i> (Sims) G.Don		Herb
Asteraceae	<i>Galinsoga parviflora</i> Cav.		Herb
Asteraceae	<i>Laggera alata</i> Schultz Bip. ex Olive		Herb
Asteraceae	<i>Chromolaena odorata</i> King & Robinson		Herb
Asteraceae	<i>Tridax procumbens</i> L.		Herb
Asteraceae	<i>Aspilia africana</i> (Pers.) C.D Adams	Kalan wuka	Herb
Asteraceae	<i>Baccharoides adoensis</i> (Sch. Bip. ex Walp.) H. Rob		Herb
Asteraceae	<i>Melanthera scandens</i> Schum and Thonn		Herb
Asteraceae	<i>Syndrella nodiflora</i> Gaertn		Herb
Asteraceae	<i>Hypoestes cancellata</i> Nees		Herb
Balanitaceae	<i>Balanites aegyptiaca</i> (L.) Delile	Aduwa	Tree
Brassicaceae	<i>Brassica oleraceae var. capitata</i> L.	Kabeji	Herb
Burseraceae	<i>Boswellia dalzielli</i>	Hano	Herb
Burseraceae	<i>Commiphora africana</i>	Dashi	Tree
Cambretaceae	<i>Terminalia catappa</i>		Tree
Cambretaceae	<i>Anogeissus leiocarpus</i> (DC) Guill. & Perr.	Marke	Tree
Cambretaceae	<i>Combretum glutinosum</i> Perr.	Katakkara	Shrub
Cambretaceae	<i>Combretum platypterum</i> Welw. ex M.A.Lawson		Climber
Cambretaceae	<i>Combretum racemosum</i> P.Beauv		Climber
Cambretaceae	<i>Combretum mucronatum</i> Schumach.	Geza	Shrub
Cannabinaceae	<i>Cannabis sativa</i> L.	Wiwi	Herb
Capparidaceae	<i>Boscia salicifolia</i>	Zure	Herb
Caprifoliaceae	<i>Lonicera caprifolium</i> L.		Tree
Caricaceae	<i>Carica papaya</i> L.	Gwanda	Tree
Cleomaceae	<i>Gynandropsis gynandra</i> (L.) Briq.	Gasaya	Herb
Cochlospermaeae	<i>Cochlospermum planchonii</i> Hook.f. ex Planch	Rawaya	Herb
Cochlospermaeae	<i>Cochlospermum tinctorium</i> Perr. ex A. Rich.	Balangade	Herb
Connaraceae	<i>Rourea coccinea</i> (Schumach, & Thonn.) Benth	Tsamiyar kasa	Shrub
Convolvulaceae	<i>Evolvulus salsinoides</i> L..	Kafi malam	Herb
Convolvulaceae	<i>Ipomea batata</i> (L.) Poir.	Dankali	Herb
Convolvulaceae	<i>Ipomea asarifolia</i> (DEsr.) Roem. & Schult	Duman kada	Herb
Convolvulaceae	<i>Ipomea argenteaurata</i> Hallier F.	Kafi boka	Herb
Convolvulaceae	<i>Ipomoea involucrata</i> Beauv		Herb
Convolvulaceae	<i>Ipomoea carnea</i> Jacq.		Shrub
Convolvulaceae	<i>Ipomoea mauricata</i> L.	Yaryadi	Herb
Cucurbitaceae	<i>Momordica charantia</i> L.		Climber
Cucurbitaceae	<i>Citrullus lanatus</i> (Thumb.)	Agushi	Climber
Cucurbitaceae	<i>Coccinia grandis</i> L.	Gurjin daji	Climber
Cucurbitaceae	<i>Citrullus colocynthis</i> (L.) Schrader	Guna	Climber

Cucurbitaceae	<i>Cucumis melo</i> L.	Kankana	Climber
Cucurbitaceae	<i>Cucurbita maxima</i> L.	Kabewa	Climber
Cucurbitaceae	<i>Cucumis prophetarum</i> L.	Kan fakara	Climber
Cyperaceae	<i>Cyperus alternifolius</i> Rottb.	Ranransa	Herb
Cyperaceae	<i>Cyperus esculentus</i> L.	Aya	Herb
Dichapetalaceae	<i>Dichapetalum toxicarium</i> (G. Don) Baill.		Shrub
Ebenaceae	<i>Diospyros canaliculata</i> De. Wild		Tree
Ebenaceae	<i>Diospyros mespiliformis</i> Hochst. ex. DC	Kanya	Tree
Euphorbiaceae	<i>Jatropha curcas</i> L.	Cindazugu	Shrub
Euphorbiaceae	<i>Jatropha gossypifolia</i> L.	Bindazugu	Shrub
Euphorbiaceae	<i>Euphorbia balsamifera</i> Aiton, Hort	Alyara	Shrub
Euphorbiaceae	<i>Euphorbia heterophylla</i> L.		Herb
Euphorbiaceae	<i>Euphorbia hysopifolia</i> L.		Herb
Euphorbiaceae	<i>Croton lobatus</i> L.	Namijin gasaya	Herb
Euphorbiaceae	<i>Euphorbia tirucalli</i> L.		Tree
Euphorbiaceae	<i>Euphorbia convulvuloides</i>	Nonon kurciya	Herb
Euphorbiaceae	<i>Macaranga barteri</i> Müll. Arg.		Shrub
Euphorbiaceae	<i>Ricinus communis</i> L.	Zurma	Shrub
Euphorbiaceae	<i>Euphorbia hirta</i> Linn.	Nonon kurciya	Herb
Euphorbiaceae	<i>Manibot esculenta</i> Crantz	Rogo	Shrub
Euphorbiaceae	<i>Alchornea cordifolia</i> (schumach. & Thomas)		Shrub
Euphorbiaceae	<i>Croton zambesicus</i> Mull.Arg		Tree
Euphorbiaceae	<i>Mallotus oppositifolius</i> (Geiseler) Mull. Arg.		Herb
Euphorbiaceae	<i>Acalypha fimbriata</i> Schumach. & Thonn		Shrub
Euphorbiaceae	<i>Acalypha godseffiana</i> Mull.Agr	Jinwinini	Shrub
Euphorbiaceae	<i>Alchornea laxiflora</i> Benth.		Herb
Euphorbiaceae	<i>Bridelia ferruginea</i> Benth	Kirni	Herb
Euphorbiaceae	<i>Phyllanthus amarus</i> Schum. et Thonn.	Geron tsuntsaye	Herb
Euphorbiaceae	<i>Phyllanthus mellerianus</i> (Kuntze.) Exell	Majiriyar kurmi	Shrub
Euphorbiaceae	<i>Phyllanthus odontadenius</i> Mull. Arg.		Herb
Euphorbiaceae	<i>Hura crepitans</i> L.		Tree
Fabaceae	<i>Senna obtusifolia</i> (L.) Roxb.	Tafasa	Herb
Fabaceae	<i>Abrus precatorius</i> L.	Idon zkara	Herb
Fabaceae	<i>Desmodium velutimum</i>	Dan kadafi	Herb
Fabaceae	<i>Senna italica</i> Mill	Filasko	Herb
Fabaceae	<i>Crotalaria goreensis</i> Guill. & Perr.	Gyadar awaki	Herb
Fabaceae	<i>Crotalaria pallida</i> var. <i>obovata</i> (G.Don) Polhil	Bakar bi rana	Herb
Fabaceae	<i>Senegalia macrostachya</i> Rchb. Ex. D.C.	Gardaye	Tree
Fabaceae	<i>Senna singueana</i> (Delile) Lock	Runhu	Tree
Fabaceae	<i>Pericopsis laxiflora</i> (Benth.) Meeuwen	Farin makarfo	Tree
Fabaceae	<i>Crotallia pallida</i> alton (G.Don) Polhil	Farar bi rana	Herb
Fabaceae	<i>Crotalaria macrocalyx</i> Benth.	Katsemi	Herb
Fabaceae	<i>Crotalaria senegalensis</i> (Pers.) Dc.	Kawan tankarki	Herb
Fabaceae	<i>Crotalaria retusa</i> L.	Saworo	Herb
Fabaceae	<i>Crotalaria arenaria</i> Benth.	Manta uwa	Herb
Fabaceae	<i>Vigna vexillata</i> (L.) A. Rich.	Waken damo	Herb
Fabaceae	<i>Mimosa peduca</i> L.	Karka tabani	Herb
Fabaceae	<i>Acacia macrostachya</i> Rchb. Ex. D.C.	Gardaye	Tree
Fabaceae	<i>Cassia areeb</i> Delile	Malga	Tree
Fabaceae	<i>Faidherbia albida</i> (Delile) A. Chev,	Gawo	Tree
Fabaceae	<i>Senna siamea</i> (Lam.) H.s Irwin & Barneby	Kesiya	Tree
Fabaceae	<i>Parkia biglobosa</i> (Jacq.) G.Don	Dorowa	Tree
Fabaceae	<i>Delonix regia</i> (Hook.) Raf.	Barankachau	Tree
Fabaceae	<i>Prosopis africana</i> (Guill & Perr.) Taub.	Kirya	Tree
Fabaceae	<i>Dichrostachys cinerea</i> (L.) Wight & Arn,	Dundu	Tree
Fabaceae	<i>Senegalia ataxacantha</i> Dc.	Sarkakiya	Tree
Fabaceae	<i>Albizia lebbeck</i> (L.) Benth,	Kachau kachau	Tree
Fabaceae	<i>Senna obtusifolia</i> (L.) H.S Irwin & Barneby	Tafasa	Herb
Fabaceae	<i>Vechellia nilotica</i> (L.) P.JH. Hurter & Mabb.	Bagaruwa	Tree
Fabaceae	<i>Vachellia sieberiana</i> (DC.) Kyal.and Boatwr.	Farar kaya	Tree

Fabaceae	<i>Cassia fistula</i> L.	Malga	Tree
Fabaceae	<i>Senna occidentalis</i> (L.) Link	Rai dore	Herb
Fabaceae	<i>Vachellia bebedlada</i> Dc.	Bakar kaya	Tree
Fabaceae	<i>Albizia chevalieri</i> Harms	Katsari	Tree
Fabaceae	<i>Burkea africana</i> Hook.	Bakin makarho	Tree
Fabaceae	<i>Entada africana</i> Guill. & Perr.	Tawatsa	Tree
Fabaceae	<i>Vachellia seyal</i> (Delile) P.J.H.Hurter	Jushi	Tree
Fabaceae	<i>Mimosa pigra</i> L.	Kardaji	Herb
Fabaceae	<i>Chamaecrista mimosoides</i> L.	Bagaruwar kasa	Herb
Fabaceae	<i>Mimosa pudica</i> L.	Karka tabani	Herb
Fabaceae	<i>Ormocarpum sennoides</i> Willd.	Tsamiyar biri	Tree
Fabaceae	<i>Senegalia polyacantha</i> Wild.	Karaki	Tree
Fabaceae	<i>Senegalia senegal</i> (L.) Britton	Dakwa	Tree
Fabaceae	<i>Albizia coriaria</i>	Dorowar mahalba	Tree
Fabaceae	<i>Dialium guinensis</i> Willd.	Tsamiyar biri	Herb
Fabaceae	<i>Pterocarpus santalinoides</i> Dc.	Gunduru	Tree
Fabaceae	<i>Leucaena leucocephala</i> (Lam.) de Wit	Kafi bedi	Tree
Fabaceae	<i>Bauhinia reticulatum</i> (Schum.) Milne Redhead	Kalgo	Tree
Fabaceae	<i>Pterocarpus erinaceus</i> Poir.	Madobiya	Tree
Fabaceae	<i>Bauhinia rufescens</i> Lam.	Tsatstsagi	Shrub
Fabaceae	<i>Isoberlinia doka</i> Craib & Stapf	Doka	Tree
Fabaceae	<i>Tamarindus indica</i> L.	Tsamiya	Tree
Fabaceae	<i>Detarium microcarpum</i> Guill. & Perr.	Taura	Tree
Fabaceae	<i>Daniella oliveri</i> Hutch. & Dalziel	Maje	Tree
Fabaceae	<i>Glycine max</i> (L.) Merr.	Waken soya	Herb
Fabaceae	<i>Phaseolus vulgaris</i> L.	Wake	Herb
Fabaceae	<i>Ormocarpum pubescens</i> Hochst. Ex A. Rich)	Tsa	Tree
Fabaceae	<i>Ahysicarpus vaginalis</i> (L.) Dc.	Gadagi	Herb
Fabaceae	<i>Ptericarpus erinaceus</i> Poir.	Madubiya	Herb
Fabaceae	<i>Indigofera astragalina</i> Dc.	Kai kai koma kan mashekiya	Herb
Fabaceae	<i>Pericopsis lexiflora</i> (Benth.) Meeuwen	Farin makarho	Tree
Fabaceae	<i>Vigna unguiculata</i> (L.) Walp.	Wake	Herb
Fabaceae	<i>Vigna vexillata</i> (L.) A. Rich.	Waken damo	Herb
Fabaceae	<i>Lonchocarpus sericeus</i> (Poir.) Dc.	Farin sansami	Herb
Fabaceae	<i>Abrus precatorius</i> L.	Idon zakara	Herb
Fabaceae	<i>Vigna mebranacea</i> A. Rich.	Waken gajan gajan	Herb
Fabaceae	<i>Vigna membranaceae</i> A. Rich.	Waken gajan gajan	Herb
Fabaceae	<i>Desmodium velutinum</i> (Wild.) Dc.	Dan kadafi	Herb
Fabaceae	<i>Tephrosia pedicellata</i> Baker	Shibi	Herb
Fabaceae	<i>Indigofera pilosa</i> Poir	Kunnen kusu	Herb
Fabaceae	<i>Uraria picta</i> (Jacq.) Dc.	Kasa kaifi	Herb
Fabaceae	<i>Tephrosia bracteolate</i> Guill. Perr.	Kini	Herb
Fabaceae	<i>Indigofera oblongifolia</i> Forssk.	Faskara toyi	Herb
Fabaceae	<i>Indigofera polyphylla</i> DC	Babar rini	Herb
Fabaceae	<i>Indigofera conferta</i> J.B. Gillett	Bakin bunu	Herb
Fabaceae	<i>Tephrosia vogelii</i> Hook.f.	Magyamfa	Herb
Fabaceae	<i>Mucuna pruriens</i> L.	Karara	Herb
Fabaceae	<i>Indigofera hirsuta</i> L.	Gaydar biri	Herb
Fabaceae	<i>Tephrosia purpurea</i> (L.) Pers.	Maraguwa	Herb
Fabaceae	<i>Tephrosia paniculata</i> Welw. Ex Baker	Magimfa	Herb
Fabaceae	<i>Dalbergia sissoo</i> Roxb.	Makari	Tree
Fabaceae	<i>Tephrosia linearis</i> (Wild.) Pers	Tsintsiyar maharba	Herb
Fabaceae	<i>Indigofera nummulariifolia</i> (L.) Alston	Cucun karya	Herb
Fabaceae	<i>Indigofera pilosa</i> Poir	Kunnen kusu	Herb
Fabaceae	<i>Tephrosia paniculata</i> Welw. Ex Baker	Magimfa	Herb
Fabaceae	<i>Centrosema molle</i> Mart. Ex Benth.	Waken filfilo	Herb
Fabaceae	<i>Sesbania dalzielii</i> E. Phillips & Hutch.	Zamarke	Shrub
Fabaceae	<i>Arachis hypogaea</i> L.	Gyada	Herb
Fabaceae	<i>Vigna subterranea</i> (L.) Verdc.	Kuriga	Herb

Fabaceae	<i>Sesbania delzjelii</i> E. Philips and Hutch	Zamarke	Herb
Fabaceae	<i>Parkia biglobosa</i>	Dorowa	Tree
Fabaceae	<i>Albizia zygia</i>	Madubiyar rafi	Tree
Fabaceae	<i>Delonix regia</i> (Hook.) Raf.	Barankachau	Tree
Fabaceae	<i>Erythrina senegalensis</i>	Minjirya	Tree
Fabaceae	<i>Sesbania dalzielii</i>	Kalumba	Herb
Fabaceae	<i>Stylosanthes erecta</i>	Fasafako	Herb
Fabaceae	<i>Vigna unguiculata</i> (L.) Walp.	Wake	Herb
Fabaceae	<i>Leucas martinensis</i>	Bunsurun fadama	Herb
Flacourtiaceae	<i>Caloncoba glauca</i> (P. Beauv.)	Kakan dika	Tree
Labiaceae	<i>Ocimum gratissimum</i> L.	Daddoya	Herb
Lamiaceae	<i>Vitex doniana</i> Sweet.	Dinya	Tree
Lamiaceae	<i>Hyptis lancoelata</i> Poi		Herb
Lecythidaceae	<i>Napoleona imperialis</i> P. Beauv.	Mabungi	Herb
Liliaceae	<i>Allium ascalonicum</i>	Albasa maigo	Herb
Liliaceae	<i>Allium cepa</i> L.	Albasa	Herb
Liliaceae	<i>Allium sativum</i> L.	Tafarnuwa	Herb
Liliaceae	<i>Asparagus africana</i> Lam.	Aluki	Herb
Liliaceae	<i>Pancratium trianthum</i> Herb.	Hatsin manoma	Herb
Liliaceae	<i>Aleo vera</i> (L.) Burm.f.	Aloe	Herb
Loganiaceae	<i>Anthocleista djalonsensis</i> A. Chev	Kwara	Tree
Loranthaceae	<i>Englerina lecardii</i>	Kauci	Herb
Loranthaceae	<i>Englerina gabonensis</i> (Engl.) Balle	Kauci	Herb
Lycopodiaceae	<i>Lycopodium cernuum</i> L.	Kuje-kuje	Herb
Lythraceae	<i>Lawsonia inermis</i> L.	Lalle	Shrub
Malvaceae	<i>Sida acuta</i> Burm. F.	Lalo	Herb
Malvaceae	<i>Gossypium hirsutum</i> L.	Tsintsiya	Grass
Malvaceae	<i>Adansonia digitata</i> L.	Kuka	Tree
Malvaceae	<i>Gossypium barbadense</i> L.		Shrub
Malvaceae	<i>Malvastrum coromandelianum</i> (L.) Garcke		Herb
Malvaceae	<i>Abelmoschus esculentus</i>	Kubewa	Herb
Malvaceae	<i>Abutilon mauritianum</i>	Faru, kawo	Herb
Malvaceae	<i>Hibiscus asper</i>	Dangira	Shrub
Malvaceae	<i>Hibiscus rosasinensis</i>		Shrub
Malvaceae	<i>Hibiscus sabdariffa</i>	Zobo	Herb
Malvaceae	<i>Hibiscus cannabinus</i>	Rama	Herb
Malvaceae	<i>Bombax buonopozense</i> P.Beauv		Tree
Malvaceae	<i>Pachira glabra</i> Pasq.		Tree
Malvaceae	<i>Gossypium barbadense</i> L.	Auduga	Herb
Malvaceae	<i>Sida ovata</i> Forssk	Miyar tsanya	Herb
Malvaceae	<i>Sida acuta</i> Burm.f.		Herb
Malvaceae	<i>Sida cordifolia</i> L.	Farar hankufa	Herb
Martyniaceae	<i>Martynia annua</i> L.	Daddawan kusa	Herb
Meliaceae	<i>Khaya grandifoliola</i>	Melina	Tree
Meliaceae	<i>Khaya senegalensis</i>	Madaci	Tree
Meliaceae	<i>Azadirachta indica</i> A. Jussieu.	Dogon yaro	Tree
Moraceae	<i>Antiaris Africana</i> Engl.	Farinloko	Tree
Moraceae	<i>Ficus mucosa</i> L.	Jan-baure	Tree
Moraceae	<i>Ficus capensis</i> Thumb.	Farin-baure	Tree
Moraceae	<i>Ficus elastica</i> Roxb.ex Hornem.		Tree
Moraceae	<i>Antiaris toxicaria</i> A.Chev.		Tree
Moringaceae`	<i>Moringa oleifera</i> Lam.	Zogale	Shrub
Myrtaceae	<i>Psidium guajava</i> L.	Gwaba	Tree
Nyctaginaceae	<i>Boerhaavia diffusa</i> L.nom.cons	Babba jubji	Herb
Nyctaginaceae	<i>Boerhavia erecta</i> L.	Sarkin jibji	Herb
Nymphaeaceae	<i>Nymphaea lotus</i> Banks ex Gaertn.	Bado	Herb
Opilliaceae	<i>Opilia celtidifolia</i> (Guill. & Perr.)	Inuwar gada	Tree
Oxalidaceae	<i>Oxalis corniculata</i> L.	Tsuku	Climber
Poaceae	<i>Cynbopogon Citratus</i> (D.C ex Nees) Stapf	Tsauri	Grass
Poaceae	<i>Andropogon tectorum</i> Schum & Thonn	Gabaa	Grass

Poaceae	<i>Cynodon dactylon</i> Linn	Tsarkiyar zomo	Grass
Poaceae	<i>Setaria megaphylla</i> (Steud) Dur. & Shinz		Grass
Poaceae	<i>Pennisetum polystachion</i> (Linn) Schult	Kyasuwa	Grass
Poaceae	<i>Brachiaria Jubata</i> (Fig & D Not) Stapf	Tunbin jaki	Grass
Poaceae	<i>Eragostis atrovirens</i> (Desf.) Trin. ex Steud		Grass
Poaceae	<i>Setaria megaphylla</i> (Steud) Dur. & Shinz		Grass
Poaceae	<i>Eleusine indica</i> (Linn) Gaertn.	Tuji	Herb
Portulacaceae	<i>Portulaca oleraceae</i> L.	Babba jubji	Herb
Rubiaceae	<i>Dioda scandens</i> SW		Herb
Rubiaceae	<i>Borreria ocymoides</i> (Burm. f.) DC		Herb
Rubiaceae	<i>Mitracarpus scaber</i> Zucc. ex Schult. et Schult.		Herb
Rutaceae	<i>Citrus lemon</i> (L.) Burm. F.		Tree
Rutaceae	<i>Citrus sinensis</i> Pers.	Lemun zaki	Tree
Rutaceae	<i>Zanthoxylum leprieurii</i> Guill. & Perr.		Tree
Sapindaceae	<i>Lecaniodiscus cupanioides</i> Planch.	Kafi nama zaki	Shrub
Sapindaceae	<i>Paullinia pinnata</i> L.	Kana kana	Shrub
Sapindaceae	<i>Blighia sapida</i> K.D.Koenig	Alalee	Tree
Sapotaceae	<i>Vitellaria paradoxa</i> C.F.Gaertn	Kadanya	Tree
Solanaceae	<i>Physalis micrantha</i> Link		Herb
Solanaceae	<i>Physalis angulata</i> L.	Dumashin maza	Herb
Solanaceae	<i>Datura metel</i> L.		Shrub
Solanaceae	<i>Solanum melongena</i> L.		Shrub
Solanaceae	<i>Datura stramonium</i> L.	Zakami	Herb
Sterculiaceae	<i>Cola nitida</i> Schott & Endl.	Ataras	Herb
Sterculiaceae	<i>Melochia corchorifolia</i> L.	Tukura	Herb
Sterculiaceae	<i>Hildegardia barteri</i>	Karanga	Herb
Teraceae	<i>Launea taraxacifolia</i> (Willd) Amin. ex C. Jeffery	Namijin dayi	Herb
Verbenaceae	<i>Lantana camara</i> L.	Kimba	Herb
Verbenaceae	<i>Lippia multijflora</i> Hochst.		Herb
Verbenaceae	<i>Gmelina arborea</i> Roxb		Tree
Verbenaceae	<i>Tectona grandis</i> L.f.		Tree
Zingiberaceae	<i>Aframomun melegueta</i> K. Schum.	Citta	Herb
Zingiberaceae	<i>Curcuma longa</i> L.	Kangamu	Herb
Zingiberaceae	<i>Kaempferia nigerica</i>		Herb
Zygophyllaceae	<i>Guaiacum officinale</i> L.		Tree

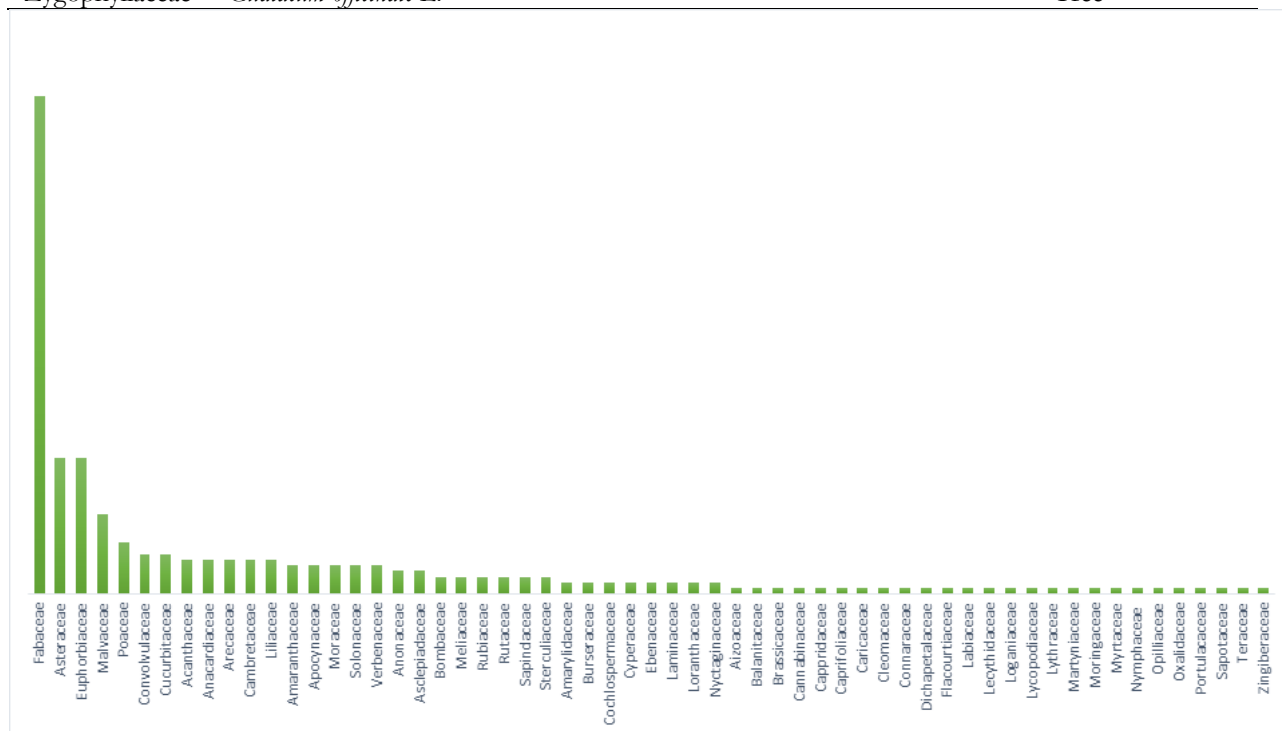


Figure 2: Number of species cut across all families.

Table 2: Distribution of species within families based on lifeforms/habits.

Family	Trees	Shrubs	Grass	Climbers	Herbs
Acanthaceae	-	-	-	-	6
Aizoaceae	-	-	-	-	1
Amaranthaceae	-	-	-	-	3
Amarylidaceae	-	-	-	-	2
Anacardiaceae	5	-	-	-	1
Anonaceae	5	-	-	-	-
Apocynaceae	2	2	-	-	1
Arecaceae	6	-	-	-	-
Asclepiadaceae	-	2	-	-	2
Asteraceae	-	-	-	-	20
Balanitaceae	1	-	-	-	-
Brassicaceae	-	-	-	-	1
Burseraceae	1	-	-	-	1
Cambretaceae	2	2	-	2	-
Cannabinaceae	-	-	-	-	1
Capparidaceae	-	-	-	-	1
Caprifoliaceae	1	-	-	-	-
Caricaceae	1	-	-	-	-
Cleomaceae	-	-	-	-	1
Cochlospermaceae	-	-	-	-	2
Connaraceae	-	1	-	-	-
Convolvulaceae	-	1	-	-	6
Cucurbitaceae	-	-	-	7	-
Cyperaceae	-	-	-	-	2
Dichapetalaceae	-	1	-	-	-
Ebenaceae	2	-	-	-	-
Euphorbiaceae	3	10	-	-	10
Fabaceae	39	2	-	-	55
Flacourtiaceae	1	-	-	-	-
Labiaceae	-	-	-	-	1
Lamiaceae	1	-	-	-	1
Lecythidaceae	-	-	-	-	1
Liliaceae	-	-	-	-	6
Loganiaceae	1	-	-	-	-
Loranthaceae	-	-	-	-	2
Lycopodiaceae	-	-	-	-	1
Lythraceae	-	1	-	-	-
Malvaceae	3	3	1	-	10
Martyniaceae	-	-	-	-	1
Meliaceae	3	-	-	-	-
Moraceae	5	-	-	-	-
Moringaceae	-	1	-	-	-
Myrtaceae	1	-	-	-	-
Nyctaginaceae	-	-	-	-	2
Nymphaeaceae	-	-	-	-	1
Opiliaceae	1	-	-	-	-
Oxalidaceae	-	-	-	1	-
Poaceae	-	-	8	-	1
Portulacaceae	-	-	-	-	1
Rubiaceae	-	-	-	-	3
Rutaceae	3	-	-	-	-
Sapindaceae	1	2	-	-	-
Sapotaceae	1	-	-	-	-
Solanaceae	-	2	-	-	3
Sterculaceae	-	-	-	-	3
Teraceae	-	-	-	-	1
Verbinaceae	2	-	-	-	2
Zingiberaceae	-	-	-	-	3
Zygophyllaceae	1	-	-	-	-

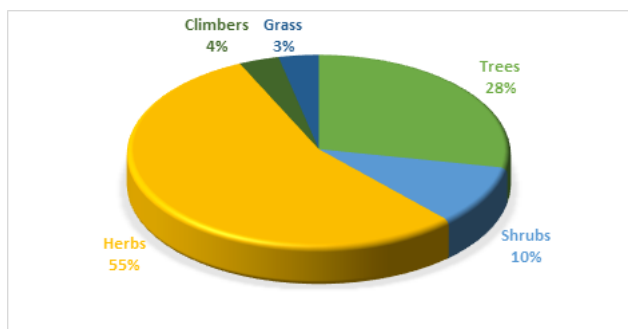


Figure 3: Species distribution across lifeforms/habits

The figure 3 above showed that herbs dominated the life forms/habits identified, containing 55% of the total enumeration. This was followed by trees with 28% and shrubs with 10%, respectively. The climbers constituted 4% and grasses 3% respectively.

The distribution of species across the families based on lifeforms/habits is presented in Table 2 (preceding page). Only Malvaceae had species in 4 different lifeforms/habits. Apocynaceae, Cambretaceae, and Fabaceae all had species across 3 lifeforms/habit, while 9 families were represented by 2 lifeforms/habit and the remaining 45 families had species represented by 1 lifeform/habit only. However, the trees spread across 25 families, the shrubs 13 families, the grasses 2 families, the climbers 3 families and the herbs cut across 35 families.

DISCUSSION

Plants are universally recognized as a vital component of biodiversity and global sustainability. For example, plants provide food (around 7,000 species are used for food), fibre, fuel, shelter, and medicine. Healthy ecosystems based on plant diversity provide the conditions and processes that sustain life and are essential to the well-being and livelihoods of all humankind (Chukwuma and Adebisi-Fagbohunge 2015; Abere and Opara 2012). Ecosystem services provided by plants include the production of oxygen and assimilation/ sequestration of carbon dioxide (CO₂) in both terrestrial and aquatic systems that currently removes about 50% of anthropogenic CO₂ emission; the creation, stabilization and protection of soil, essential for most of the Earth's productive agricultural systems and the major carbon pool in the terrestrial biosphere. Plants also form the basis of the trophic pyramid in all terrestrial and most aquatic ecosystems on which we and all other animal species inevitably depend. In addition, plants provide a vast multitude of natural resources for humanity, especially in the developing world. They provide the basis for our food, most medicine and other materials essential for our daily lives.

The present study showed that the family Fabaceae have been distributed across the study area. This agrees with the findings of Soladoye and Lewis 2003, Soladoye *et al.* 2011, Ayodele and Yang 2012, and Soladoye *et al.* 2015 which

stated that Fabaceae have been abundantly distributed across Nigeria's vegetation zones. The result also agreed with a previous study by Soladoye *et al.*, (2013) whose report clearly showed that Africa has a vast array of indigenous legumes (Fabaceae) consisting of large rainforest trees and small annual herbs. However, the study is in line with the research conducted in Brazil (Eduardo *et al.*, 2014); Fabaceae was also found as the family with the highest number of species in the resting of the states of Ceará (Santos Filho *et al.*, 2011), Ayodele and Yang 2012; Rio Grande do Norte (Almeida Jr. and Zickel 2009).

Based on the lifeforms/habits, the study revealed that herbs are found abundantly distributed in the study area; this is congruent with the finding of Eduardo *et al.*, 2014, in a survey conducted in areas of restinga in the Ceará state, most of the species found also belonged to the herbaceous stratum. The significance of herbaceous species in resting areas reflects the pioneer characteristic of the vegetation of this ecosystem (Santos-Filho *et al.*, 2011; Chukwuma *et al.*, 2020), adapted to local adverse environmental conditions.

However, human activities contributed immensely toward the destruction of the natural ecosystem such as the expansion of farming land, urbanization, industrialization and infrastructural development, logging and fuel wood, bush burning, overgrazing, mining, forest and other plantations, corruption and political causes; these activities are escalating in an unprecedented manner these pose various degree of threats to biodiversity conservation in Nigeria (Durugbo *et al.*, 2012; Alamu and Agbeja 2011; Pelemo *et al.*, 2011; NBSAP, 2001). This study revealed that habitat conversion as a result of urbanization indiscriminate degradation for the development of several infrastructural facilities to meet the insatiable human needs and subsistence farming were observed to be the stringent problems facing the flora of this area. The entire flora in the study area has been degraded such that the vegetation cleared to build public housing or infrastructures, fuel wood, and other medicinal reasons, drainage patterns were drastically changed, and streams were straightened, redirected and made into concretized canals and ditches. This result agrees with the earlier suggestion of Nodza *et al.*, 2014; Abere and Opara, 2012; Adewuyi, 2012; Nodza, 2011; Omofonmwan and Edoh, 2008.

This checklist and documentation of the flora of Zamfara State provided a hint on the flora destruction rate that exists in the study area, with which, if adequate measures are not taken, may lead most of the vulnerable species extinct or those with low risk vulnerable or threatened. Conservation efforts should be stepped up for such floral species to prevent them from going into extinction. The results of this work will serve as baseline data that could be helpful in the appraisal of plant resources of the ecosystem for its effective management. The continuous involvement of rural communities around the State should be rewarded, in the form of incentives, by the government

agency responsible for the protection and management of the State.

CONCLUSION

A checklist of the floral species in some selected Local Government of Zamfara State have been documented. It showed that diverse flora species are necessary components of the environment due to their economic value. Human Anthropogenic activities are the major reasons behind the rapid decrease in flora species in the State. Hence, there is a need for the State government and the entire community to pay attention to conservation planning and management activities that will consider ecological implications. This research, being a baseline study, has opened up space for further research; hence, it is recommended that more research should be carried out on the identified flora to ascertain their morphological, anatomical, ethnobotanical and economic importance.

REFERENCES

- Abere, S.A. and Opara, J. (2012). Deforestation and Sustainable Development in the Tropics: Causes and Effect. *Journal of Educational and Social Research* 2 (4):104-109.
- Adewuyi, T.O. (2012). Recent Consequences of land degradation on Farmland in the Peri-Urban area of Kaduna metropolis, Nigeria. *Journal of Sustainable Development in Africa* 14 (3):154-193.
- Adeyemi, T.O. and Ogundipe, O.T. (2012). Biodiversity of Sapindaceae in West Africa: A checklist: *International Journal of Biodiversity and Conservation* 4 (10):358-363. [\[Crossref\]](#)
- Alamu, L.O. and Agbeja, B.O. (2011). Deforestation and endangered indigenous tree species in South-West Nigeria. *International Journal of Biodiversity and Conservation* 3(7): 291-297.
- Almeida Jr. E.B. and C.S. ZICKEL. (2009). Fisionomia Psamófila-reptante: Riqueza e composição de Espécies na Praia da Pipa, Rio Grande do Norte, Brasil. *Pesquisas, Botânica*, 60: 289-299.
- Ariwaodo JO, Adeniji KA & Akinyemi OD (2012a). The vascular flora on Asamagbe stream bank, Forestry Research Institute of Nigeria (FRIN) premises, Ibadan, Nigeria. *Annals of Biological Research* 3: 1757- 1763.
- Ayodele A.E. & Yang Y (2012) Diversity and distribution of vascular plants in Nigeria. Published by Qingdao Publishing House, Qingdao, China, 350 p.
- Batta, H., Ashong, C.A. and Bashir, A.S. (2013). Press Coverage of Climate Change Issues in Nigeria and Implications for Public Participation Opportunities. *Journal of Sustainable Development* 6(2):56. [\[Crossref\]](#)
- Cardoso, L.J.T. 2014. Balanophoraceae, in: *Lista de Espécies da Flora do Brasil*. Jardim Botânico do Rio de Janeiro. Accessible at <http://>
- Chukwuma EC & Adebisi-Fagbohunge TA (2015) A checklist of angiosperm diversity surrounding Awba Dam: an important reservoir in Ibadan, Nigeria. *Plant Science Today* 2(4): 116-122. [\[Crossref\]](#)
- Chukwuma EC, Chukwuma DM & Adio AF (2020) Flora diversity of Ijero Local Government Area of Ekiti State, South-Western Nigeria. *Tropical Plant Research* 7(1): 55-64]. [\[Crossref\]](#)
- Eduardo Vinícius da Silva Oliveira, Jéssica Ferreira Lima, Tatiane Costa Silva and Myrna Friederichs (2014). Checklist of the flora of the Restingas of Sergipe State
- F.A.O., (2010). *Global Forest Resources Assessment 2000: Food and Agriculture Organization of the United Nations Rome. Italy* <http://www.fao.org/forestry/site/24690/en>
- GIARDINA G., RAIMONDO F.M. & SPADARO V., 2007 - A catalogue of the plants growing in Sicily. - *Boccone* 20(2007): 5-582.
- Holmgren PK, Keuken W and Schofield EK (1990) *Index Herbariorum, Part I: The Habaria of the World*, 8th edition. Utrecht, Regnum Veg., New York, 120 p.
- Hutchinson J, Dalziel JM and Hepper FN (1968) *Flora of West tropical Africa, Volume III, Part Crown Agents for Oversea Governments and Administrations*, London, 276 p.
- Hutchinson J, Dalziel JM and Hepper FN (1972) *Flora of West tropical Africa, Volume III, Part Crown Agents for Oversea Governments and Administrations*, London, 574 p.
- Hutchinson J, Dalziel JM and Keay R.W.J. (1954) *Flora of West Tropical Africa, Vol. 1, 2nd edition. Crown Agents for Oversea Governments and Administrations*, London, pp. 1-295.
- Hutchinson J, Dalziel JM and Keay R.W.J. (1958) *Flora of West Tropical Africa, Vol. 1, 2nd edition. Crown Agents for Oversea Governments and Administrations*, London, pp. 297-828.
- Hutchinson J, Dalziel JM, Keay R.W.J. and Hepper FN (1963) *Flora of West tropical Africa, Volume II. Crown Agents for Oversea Governments and Administrations*, London, 544 p.
- Ikyagba TE, Tee TN, Dagba BI, Anncha UP, Ngibo KD, Tume C (2015). Tree composition and distribution in Federal University of Agriculture Makurdi, Nigeria. *Journal of research in Forestry wildlife and Environment* 7(2):147-157.

- ISRIC (2007). World Soil Information. Available at: <http://www.isric.org/content/soter-publications> (Accessed on 13th June 2013).
- IUCN (2010). IUCN, Gland bulletin. Retrieved from: <http://www.iucn.org/>
- IUCN (2012). IUCN Red List of Threatened Species. Retrieved from: www.iucnredlist.org
- Jimoh, S.O., Amusa, T.O. and Azeez, I.O. (2013). Population distribution and threats to sustainable management of selected non-timber forest products in tropical lowland rainforests of south western Nigeria. *Journal of Forestry Research* 24: 75-82. [\[Crossref\]](#)
- Jing-Wei J, Yue-fei X, Hui-chun Y, Chong-yang S, Yuan-fang H (2011). Effect of land use and soil management practices on soil fertility quality in North China cities' urban fringe. *Afr. J. Agric. Res.* 6(9):2059-2065
- Kabiru, Y. (2008). Nigeria's Forest to disappear by 2020. African Conservation foundation. Network news report.
- Keay R.W.J. (1989) *Trees of Nigeria*. Oxford Science Publication, New York, 476 pp
- Ladipo, D. (2010). The state of Nigeria's forests. IITA Research for Development Reviews (specials) 4. Retrieved from <http://r4dreview.org/2010/04/the-state-of-nigeriasforests>
- Lock JM (1989) *Legumes of Africa: a check list*. Kew, England, Royal Botanic Gardens.
- Musawa B.B., Muhammad M.S. and Tukur K. (2019) Diversity and abundance of tree species within Federal Polytechnic Kaura Namoda, Zamfara State.
- Nodza IG, Onuminya TO, Ogundipe OT (2014). A Checklist of Tree Species Growing on Akoka Campus of University of Lagos, Nigeria. *International Journal of Science Environment and Technology* 3(3):10211034.
- Pelomo, O.J., Akintola, B.A., Temowo, O.O., Akande, E.O. and Akoun, M. (2011). Effects of Landscape Change on Biodiversity in Nigeria: Remote Sensing and G.I.S. Approach. *Continental Journal of Environmental Design and Management* 1 (2): 22 - 29.
- RAIMONDO F.M. & DOMINA G., 2010 - Aggiornamento sul progetto PESI (a Pan European Species-directories Infrastructure) per lo studio coordinato della biodiversità in Europa. In: PECCENINI S., DOMINA G. & SALMERI C. - La biodiversità vegetale in Italia: aggiornamenti sui gruppi critici della flora vascolare. Comunicazioni. - SBI, Firenze, pp. 7-8.
- Santos-Filho F.S., E.B. Almeida Jr., L.F. Bezerra, L.F. Lima and C.S. Zickel. (2011). Magnoliophyta, restinga vegetation, state of Ceará, Brazil. *Check List* 7(4): 478-485 (<http://www.checklist.org.br/getpdf?SL001-11>). [\[Crossref\]](#)
- Soladoye MO & Lewis GP (2003). A checklist of Nigerian Legumes. CENRAD Natural Resources Research Assessment and Conservation Series 03, Ibadan, Nigeria, West Africa, 133 p.
- Soladoye MO, Asafa BA, Sonibare MA, Ighanesebhor GA & Chukwuma EC (2011) Angiosperm Flora of Kamuku National Park: A Northern Guinea Savanna Protected Area in Nigeria. *European Journal of Scientific Research* 58(3): 326-340.
- Soladoye MO, Chukwuma EC, Fagbenro JA & Adलगun EO (2015) A Checklist of Angiosperm Diversity of Bowen University Campus, Iwo, Osun State, Nigeria. *Journal of Plant Sciences* 10(6): 244-252. [\[Crossref\]](#)
- Soladoye MO, Ikotun T, Chukwuma EC, Ariwaodo JO, Ighanesebor GA, Agbo-Adediran OA & Owolabi S.M. (2013) Our plants, our heritage: Preliminary survey of some medicinal plant species of Southwestern University Nigeria Campus, Ogun State, Nigeria. *Annals of Biological Research* 4(12): 27-34.