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DIVERSITY COMPLEX OF PLANT SPECIES SPREAD IN NASARAWA STATE, NIGERIA.

Kwon-Ndung E. H, Akomolafe G. F, Goler E. E, Terna T. P,

Okogbaa J. I, Waya J. I. and Markus, M.

Department of Botany, Federal University Lafia, PMB 146, Lafia, Nasarawa State, Nigeria

ABSTRACT: *This research was carried out to assess the plant species diversity complex in Nasarawa State, Nigeria with a view to obtain an accurate database and inventory of the naturally occurring plant species in the State for reference and research purposes. This preliminary report covers a total of nine (9) local government areas in the state. The work involved intensive survey and several visits to the sample sites for plant identification and enumeration exercise. The diversity status of each plant and the distribution across the state were also determined using standard method. A total number of 275 plant species belonging to 61 plant families were identified out of which the families Asteraceae, Poaceae, Combretaceae, Euphorbiaceae, Moraceae and Papilionaceae were the most highly distributed across the entire study area. There was great extent of diversity in the distribution of plants across all the local governments sampled. However, the highest diversity in terms of different species was recorded in Wamba LGA. The most predominant food crop across the state was found to be Sorghum spp. This preliminary work has provided a baseline data and reference point for future taxonomical and biosystematics stratagem in Nasarawa State.*

KEYWORDS: Herbarium, Conservation, Nasarawa State, Plant Diversity, *Sorghum*

INTRODUCTION

Biological diversity or biodiversity refers to the variability among living organisms from all sources including, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part. It encompasses the variety of all forms of life on earth, which provides the building blocks for human existence and our ability to adapt to environmental changes in the future (FEPA, 2003). Biological diversity involves genetic, species and ecosystem diversity. Estimates of the total number of species range from 5 million to100 million globally; though less than 1.7 million have actually been described (FEPA, 2003). Species diversity remains central to the evaluation of diversity at other levels, and is a constant point of reference in biodiversity conservation. Conservation is the planned management of natural resources, to retain the natural balance, diversity and evolutionary change in the environment. It is a protective measure taken; to prevent the loss of genetic diversity of a species; to save a species from becoming extinct and to protect an ecosystem from damage so as to promote its sustained utilization. Plant germplasm is a non-renewable natural resource indispensable for the sustenance of human life on this earth (Borokini *et al.*, 2010).

Nigeria is one of the most populous countries in Africa and has a landmass of over 923,768 square kilometers including about 13,000 square kilometers of water; enclosed within latitudes 4° 16´North and 13° 52´North of the equator and between longitudes 2°49´E and 14°37´East of Greenwich Meridian with a population of 140,003,542 and a population

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growth rate of 3.2% annually (NBS, 2007). There is an array of flora and fauna species associated with the varied ecological zones in Nigeria. There are 7,895 plant species from 338 families and 2,215 genera that have been identified in Nigeria (FGN, 2006). Nigerian moist forests are rich in epiphytic ferns and orchids, and contain over 560 species of trees which attain heights of at least 12m and girth of 60cm. According to the 2005 FAO Forest Resources Assessment Report, Nigeria has the highest rate of deforestation of primary forests between 2000 and 2005 (FAO, 2005). The Biodiversity Country Study estimated that there are 3,423 fungi species in Nigeria (UNESCO, 1973). More than 848 algal species have been identified in the marine and fresh water habitats and a little less than 200 lower plant species have been identified, although the number of these plants is most definitely higher. The great diversity of plant species found in Nigeria cannot be unconnected with the diversity of ecosystems and habitats as well as the tropical climate in the country (FEPA, 1992). Nasarawa State is one of the states in the North-Central geo-political zones in Nigeria.

Nasarawa State is bounded in the north by Kaduna State, in the west by the Abuja Federal Capital Territory, in the south by Kogi and Benue States and in the east by Taraba and Plateau States. It has a total land area of 27,137.8sqkm (NPC, 2006). Nasarawa's main economic activity is agriculture. Production of minerals such as salt is also another major economic activity in the state. It lies within the guinea Savannah region and has tropical climate with moderate rainfall (annual mean rainfall of 1311:75cm) (Nyagba, 1995). The state is made up of plain lands and hills and has some of the most beautiful sites and landscapes in the country.

There is still a lack of quantitative information on naturalized plants for major regions of the world, especially for those of Asia and Africa. Floras of these regions are either not existent or are incomplete, making it difficult to assess the native plant diversity populations. It is very true that many of our valuable plant generic resources are fast disappearing due to afore mentioned reasons and there is a careful need to document current plant diversity status so as to guide in the conservation plans to salvage the residual diversity. This study provides specific and comprehensive information on the species enumeration, diversity and conservation status of the plants in Nasarawa State, Nigeria.

MATERIALS AND METHODS

Sampling areas

Nine out of thirteen local government areas of Nasarawa State were selected at random and sampled for this study namely: Akwanga, Awe, Keffi, Kokona, Nasarawa, Nasarawa Eggon, Toto, Obi and Wamba (fig 1.).

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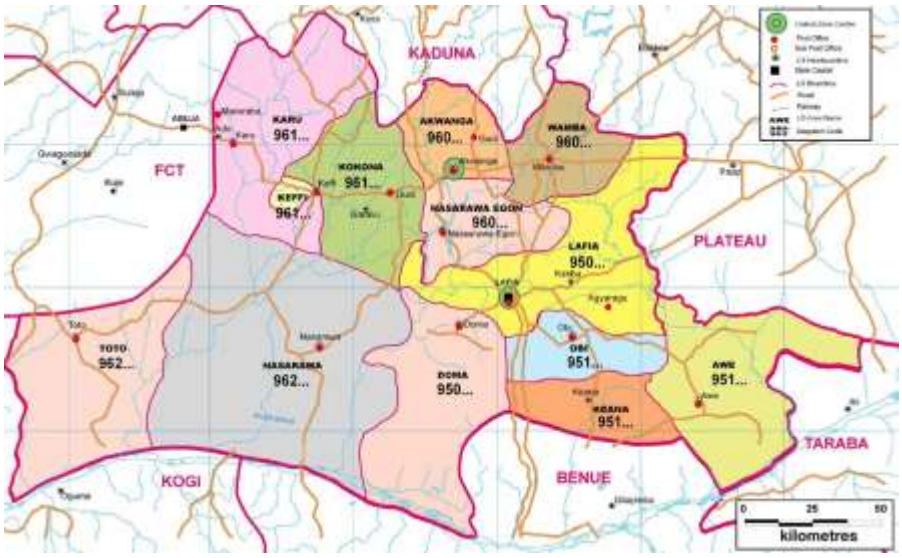

Fig. 1: showing the map of Nasarawa state as it borders with other states (source: www.google.com)

Sample collection

This study involved intensive survey and several visits to the sample sites for plant identification and enumeration exercise. Surveys and direct field observation were carried out as done in the previous works (Lipp 1989, Kayode *et al.*, 1997). In each of the selected local government area, two rural communities, which are still far from urban influence were selected. Origin, life form and habitats colonized by each species were identified as far as possible. Life samples were collected and preserved using plant presses. The identification of the plants was done with the use of published floral and books. Some unidentified plants were sent to standard herbaria for proper identification.

Species Abundance

The relative abundance of the identified botanicals within 2 kilometer radius from each of the village center were determined according to Bongers *et al.*, (1988) and Kayode (1999) as: Less than 5 individuals as Rare, 5 to 10 as Occasional, 11 to 30 as Frequent, 31 to 100 as Abundant and over 100 individuals as Very Abundant.

RESULTS

A total number of 275 plant species of different families were identified. There was great diversity in the distribution of plants across all the local governments sampled. However, the highest plant diversity in terms of different species was recorded in Wamba local government area (Table 1). Four plants have been identified as rare species namely *Emilia praetermissa, Tecoma stans, Phyllanthus amarus* and *Olax subscorpioides.* The total percentage occurrence of herbs, shrubs and trees in the 9 local governments are 31.19%, 16.29% and 47.91% respectively (Table 2). A total of 57 plant families were identified out of which the families Asteraceae, Poaceae, Combretaceae, Euphorbiaceae, Moraceae and Papilionaceae were the most highly distributed across the entire 9 local government areas (Table 3). The predominant food crops in all the local governments are *Musa sapientum, Zea mays, Sorghum bicolor,*

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Curcubita spp and *Sesame indica* (Table 4). Trees have the highest percentage occurrence and spread across the entire areas sampled in the State. Awe local government area has the lesser diversity of plant species.

DISCUSSION

The lower percentage distribution recorded in some of the identified plant families could be attributed to some of the factors affecting indigenous biodiversity in Nigeria. For instance, the destruction of natural habitats continues in Nigeria at a rapid rate in which about 65 of 560 species of trees are now faced with extinction while many others are at different stages of risk thereby leading to the depletion of the country's biodiversity (Imeht and Adebobola 2001). Awe local government area which has the lesser diversity of plant species may be caused by large area of land affected by the high rate of salt mining activities in the area.

The massive rate of deforestation is a direct cause of biodiversity loss (Borokini *et al.,* 2010) and Nigeria has been declared to have the highest rate of deforestation of primary forests in the world (FAO, 2005). Also, Eneobong (1997), reported that the rapid reducing rate of Africa's forests and bioresources is linked with civil war, conversion of land for agriculture, wild fires, poor management of available land, uncontrolled search for food, fuel wood, medicine, construction timber, overgrazing by cattle, displacement and loss of landraces, lower yielding varieties, pests and diseases, pollution (e.g. acid rain) and incomplete knowledge of the biology of many plants especially the propagation genetics aspect and adaptability of many forest plants.

Furthermore, farming and cultivation of food crops have dominated some of the local governments in the state such as Obi, Kokona, Akwanga, Nasarawa and Keffi leading to disappearance of some plants. According to Uyoh *et al.,* (2003), there has to be a balance between the uses of bioresources and their conservation thereby preserving an ecosystem, which although altered would still be rich in bioresources and at the same time would provide food and other needs as well as perform vital environmental functions on a long term basis.

The highest plant diversity distribution observed in Wamba local government area could be attributed to lesser disturbances to the natural ecosystem. In addition, there is a large area of land serving as government forest reserved or protected area in this local government. In line with some governmental agencies like Nigerian conservation foundation (NCF), the federal environmental protection agency (FEPA), the national resources council (NARECO) in collaboration with the united nations environmental programme (UNEP) and the world wide fund (WWF), and several other agencies who have engaged on protecting and preserving the country's biodiversity, this research has also provided the diversity status of some of the plants in Nasarawa State. These three plants *Emilia praetermissa, Tecoma stans* and *Phyllanthus amarus* that were identified as rare species need to be conserved appropriately to avoid total extinction.

Conclusively, this preliminary work has provided a baseline data and reference point for future taxonomical and biosystematics stratagem in Nasarawa State. It is thereby recommended that priority must be placed on creating protected areas across all the local government areas that will prevent indiscriminate exploitation of plant resources in Nasarawa State. Also, the use and implementation of the Environmental Impact Assessment (EIA) before embarking on any construction projects in the state must be encouraged.

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Table 1: Diversity Status of Plants in all the nine Local Governments

		PRESENCE IN LOCAL GOVERNMENT AREAS									OVERALL DIVERSITY STATUS
S/N	NAME OF PLANT	AKWANGA	AWE	KEFFI	KOKONA	NASARAWA	NASARAWA EGGON	OBI	TOTO	WAMBA	
1	*Uvaria chamae*	√	X	X	√	√	√	X	X	√	very abundant
2	*Crossopteryx febrifuga*	√	X	√	√	X	X	X	√	√	abundant
3	*Holarrhena floribunda*	√	X	X	X	X	√	X	X	√	occasional
4	*Lophira lanceolate*	√	X	X	X	√	X	X	√	√	abundant
5	*Parkia biglobosa*	√	X	√	√	√	√	√	√	√	abundant
6	*vitellaria paradoxa*	√	X	√	√	√	√	√	√	√	Abundant
7	*Pericopsis laxiflora*	√	X	√	√	√	X	X	X	√	frequent
8	*Detarium microcarpum*	X	√	√	X	X	X	√	√	√	frequent
9	*Gmelina arborea*	√	√	√	√	√	√	√	√	√	abundant
10	*Sarcocephalus latifolius*	√	X	√	√	X	√	√	√	√	abundant
11	*Prosopis Africana*	√	√	X	√	√	X	X	√	√	frequent
12	*Bridelia ferruginea*	√	X	X	√	√	√	√	√	√	abundant
13	*Hymenocardia acida*	√	√	X	√	√	√	X	X	√	frequent
14	*Viscum spp*	X	X	X	√	X	X	X	X	√	Occasional
15	*Cissus populnea*	X	X	X	X	√	√	√	X	√	frequent
16	*Vernonia perrottetii*	X	X	√	√	X	X	√	X	√	frequent
17	*Eriosema grisum*	√	X	√	X	X	√	√	√	√	Abundant
18	*Pavetta crassipes*	X	X	√	√	√	X	√	X	√	Abundant
19	*Dioscorea spp*	√	√	√	√	√	X	√	√	√	Abundant
20	*Dioscorea bulbifera*	√	X	X	√	√	√	√	√	√	Abundant
21	*Dioscorea spp*	√	X	√	√	√	√	√	√	√	Abundant
22	*Panicum baumanii*	√	√	√	√	√	√	√	√	√	very abundant
23	*Chromolaena odorata*	√	√	√	√	√	√	√	√	√	abundant
24	*Mangifera indica*	√	√	√	√	√	√	√	√	√	abundant
25	*Andropogon gayanus*	√	X	X	X	√	√	√	√	√	Frequent
26	*Uacapa togoensis*	X	X	X	X	X	√	√	√	√	Occasional
27	*Pennisetum pedicellatum*	√	√	√	√	√	√	√	√	√	Very abundant
28	*Piliostigma thonningii*	√	√	√	√	√	√	√	√	√	Very abundant
29	*Parinari curatellifolia*	√	X	√	√	√	√	√	√	√	very abundant
30	*Musa*	√	X	√	√	√	√	√	√	√	abundant

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	paradisiaca										
31	*Elaeis guinensis*	√	√	√	√	√	√	√	√	√	abundant
32	*Zingiber officinales*	√	X	X	X	X	√	√	√	√	frequent
33	*Abelmoschus esculentum*	√	√	√	X	X	√	√	√	√	abundant
34	*Achyranthus aspera*	√	X	X	√	√	√	X	X	√	frequent
35	*Synedrella nodiflora*	√	X	X	√	X	X	√	X	X	frequent
36	*Ipomea batata*	X	√	X	√	√	X	X	√	√	frequent
37	*Ipomea involucrata*	√	X	√	X	√	√	√	X	√	Frequent
38	*Echiopta spp*	√	X	X	X	X	√	X	√	√	Frequent
39	*Ageratum conyzoides*	X	√	X	√	√	√	X	X	√	Frequent
40	*Achyranthus spp*	√	X	X	X	√	√	√	X	√	Frequent
41	*Sida acuta*	√	√	√	√	√	√	√	√	√	Very abundant
42	*Cissampelos mucronata*	√	X	X	X	√	X	√	X	√	Frequent
43	*Vernonia spp*	√	X	√	√	√	X	√	X	√	Frequent
44	*Ocimum gratissimum*	√	√	√	√	√	√	√	√	√	Abundant
45	*Eragrostis ciliaris*	X	√	X	X	X	√	√	√	√	Frequent
46	*Chloris pilosa*	√	√	X	X	X	X	√	√	√	Frequent
47	*Eleusine indica*	√	√	X	X	X	X	X	X	√	Occasional
48	*Psidum guajava*	√	X	X	X	√	X	√	√	√	Frequent
49	*Colocasia esculenta*	X	X	X	X	X	√	√	√	√	Frequent
50	*Citrus sinensis*	√	√	√	√	√	√	√	√	√	Abundant
51	*Thevetia neriifolia*	√	X	√	√	X	√	√	√	√	Frequent
52	*Solanum spp*	√	√	√	√	√	√	√	√	√	Frequent
53	*Phyllanthus floribundus*	X	√	√	X	X	X	X	X	√	Occasional
54	*Anogeissus leiocarpa*	X	X	√	√	√	√	X	√	√	Occasional
55	*Manihot esculentum*	√	X	X	√	X	√	√	√	√	Frequent
56	*Andropogon tectorum*	√	X	√	√	√	X	√	√	√	Frequent
57	*Pennisetum polystachion*	√	√	√	√	√	√	√	√	Very abundant	Very abundant
58	*Tephrosia linearis*	√	√	√	X	√	X	X	√	√	Frequent
59	*Acacia spp*	X	X	X	X	X	√	X	X	√	Occasional
60	*Cajanus cajan*	X	X	√	√	X	√	X	√	√	Frequent
61	*Lippia spp*	X	√	√	√	X	X	X	X	√	Frequent
62	*Gardenia aqualla*	√	X	√	√	√	√	√	√	√	Frequent
63	*Grewia mollis*	√	√	√	√	√	X	X	X	√	Frequent
64	*Sorghum bicolor*	√	√	√	√	√	√	√	√	√	Very abundant
65	*Annona senegalensis*	√	X	X	X	X	X	X	X	√	Occasional
66	*Combretum spp*	√	X	√	X	X	√	√	√	√	Frequent
67	*Mitracarpus villosus*	√	√	√	√	√	√	√	√	√	abundant
68	*Terminalia avicennoides*	√	X	√	√	√	√	X	X	√	frequent
69	*Trichilia emetica*	X	X	X	√	X	√	√	√	√	occasional

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70	*Calopogonium mucunoides*	√	√	√	√	√	√	√	√	√	frequent
71	*Brachiaria jubata*	√	X	X	√	√	X	√	√	√	occasional
72	*Justicia schimperi*	X	X	√	√	X	√	√	X	√	occasional
73	*Panicum maximum*	√	√	√	√	√	√	√	√	√	frequent
74	*Rotthoellia cochinchinensis*	X	X	√	√	√	√	√	√	√	frequent
75	*Cleistopholis patens*	X	X	X	√	X	X	X	X	√	Occasional
76	*Ficus spp*	X	X	X	X	√	√	X	√	√	occasional
77	*Alchornea cordifolia*	√	√	√	√	√	√	√	√	√	frequent
78	*Erythrophleum suaveolens*	√	X	X	√	X	X	X	√	√	occasional
79	*Hyperrhenia rufa*	X	√	√	√	√	√	√	√	√	Frequent
80	*Dioscorea alata*	√	X	√	√	√	X	X	√	√	occasional
	Ipomea spp	√	X	√	X	√	√	√	√	√	occasional
81	*Aspilia Africana*	√	X	√	√	X	√	√	√	√	Frequent
82	*Tamarindus indica*	X	X	√	√	√	X	√	X	√	occasional
83	*Desmodium velutinum*	√	X	√	X	√	√	X	√	√	occasional
84	*Dachrostachys cinerea*	√	X	√	√	√	√	√	√	√	frequent
85	*Urena lobata*	√	√	√	√	√	√	√	√	√	Very abundant
86	*Borreria radiata*	X	X	X	X	√	√	√	X	√	Occasional
87	*Combretum mollis*	X	X	X	X	√	√	X	√	√	Occasional
88	*Combretu spp*	X	X	X	√	√	√	X	√	√	Occasional
89	*Entada africana*	√	√	X	X	X	√	√	X	√	Frequent
90	*Indigofera pulchra*	√	X	√	√	√	X	X	X	√	Frequent
91	*Syzyginon spp*	X	√	X	√	√	√	√	√	√	Frequent
92	*Waltheria americana*	√	X	√	√	√	√	X	X	√	Frequent
93	*Phyllanthus muellerianus*	√	X	√	X	X	√	X	√	√	Frequent
94	*Crotalaria spp*	√	X	X	√	√	X	√	√	√	Occasional
95	*Tephrosia spp*	√	X	√	√	√	X	√	X	√	Frequent
96	*Mucuna sloanei*	√	X	√	√	√	√	X	X	√	Frequent
97	*Emilia praetermissa*	X	X	X	X	X	X	X	X	√	Rare
98	*Cisus spp*	√	X	√	X	√	√	X	√	√	Frequent
99	*Hyptis suaveolens*	√	√	√	√	√	√	√	√	√	Very abundant
100	*Cassia tora*	√	√	√	√	X	√	√	√	√	Frequent
101	*Costus afer*	√	X	√	√	X	√	X	√	√	Occasional
102	*Zea mays*	√	√	√	√	√	√	√	√	√	Frequent
103	*Vitex doniana*	√	X	X	√	√	√	X	√	√	Frequent
104	*Isoberlinia doka*	√	X	X	√	√	√	X	√	√	Frequent
105	*Adenodolichos paniculatus*	X	√	√	√	√	X	X	X	√	Occasional
106	*Daniella oliveri*	√	X	√	√	√	√	√	√	√	Frequent
107	*Nelsonia canescens*	√	X	√	X	X	X	X	X	√	Occasional
108	*Hyperrhenia baigirnica*	√	X	√	√	√	√	√	√	√	Frequent
109	*Mimosa pigra*	√	X	√	X	√	X	√	√	√	Occasional
110	*Paullinia*	X	X	√	X	X	X	X	√	√	Occasional

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	pinnata										
111	*Vigna unguiculata*	√	√	√	√	X	√	√	√	√	Frequent
112	*Neuwboldia laevis*	√	X	√	√	√	√	√	√	√	Frequent
113	*Oryza sativa*	√	X	√	√	√	√	√	√	√	Abundant
114	*Adansonian digitata*	X	X	√	√	√	√	X	X	√	Occasional
115	*Euphorbia hirta*	√	X	√	X	√	√	√	X	√	Occasional
116	*Cassia sieberiana*	√	√	√	√	√	√	√	√	√	Abundant
117	*Gardenia Erubenscens*	√	X	√	√	√	X	√	X	√	Frequent
118	*Sterculia setigera*	X	√	√	√	X	√	√	√	√	Occasional
119	*Byrsocarpus coccineus*	√	X	√	√	X	√	√	√	√	Frequent
120	*Tephrosia bracteolata*	√	X	√	X	√	√	X	√	√	Frequent
121	*lpomoea spp*	√	X	√	X	√	√	X	√	√	Frequent
122	*Cochlospermum tinctorium*	√	X	√	√	√	√	√	√	√	Frequent
123	*Dialium guineense*	√	√	√	√	X	√	√	√	√	Frequent
124	*Allophyllus africnus*	√	X	√	√	X	√	√	X	√	Frequent
125	*Anchomanes difformis*	√	X	√	√	X	√	X	√	√	Occasional
126	*Bidens pilosa*	√	X	√	X	√	√	X	√	√	Occasional
127	*Smilax kraussiana*	√	X	√	√	√	√	X	√	√	Occasional
128	*Desmodium spp*	√	√	√	X	√	X	√	√	√	Frequent
129	*Landolphia owariensis*	√	X	√	√	√	√	√	X	√	Frequent
130	*Cissus spp*	√	X	√	√	√	√	X	√	√	Frequent
131	*Borassius aethiopium*	√	X	√	√	X	√	X	√	√	Occasional
132	*Ficus exasperata*	√	X	√	X	X	√	X	√	√	Occasional
133	*Stereospermum kunthianum*	√	X	√	√	X	√	X	√	√	Frequent
134	*Stylosanthes hamata*	√	√	X	√	√	X	√	X	√	Frequent
135	*Cassia rotundifolia*	√	X	√	√	X	√	X	√	√	Frequent
136	*Cassia nigricans*	√	X	√	√	√	√	X	√	√	Frequent
137	*Anacardium occidentalis*	√	√	√	√	√	√	√	√	√	Abundant
138	*Hibiscus asper*	√	X	√	X	√	X	√	X	√	Occasional
139	*Desmodium spp*	√	X	√	√	√	√	X	√	√	Frequent
140	*Imperata cylindrica*	√	√	√	√	√	√	√	√	√	Abundant
141	*Asparagus Africanus*	√	X	√	X	X	√	X	√	X	Occasional
142	*Strychnos spinosa*	√	X	√	X	X	√	X	√	X	Occasional
143	*Zormia spp*	X	X	√	X	X	√	X	√	X	Occasional
144	*Scleria verrucosa*	X	X	√	X	X	√	√	√	X	Occasional
145	*Tephrosia spp*	√	X	√	X	√	√	X	√	√	Frequent
146	*Paspalum orbiculare*	X	X	√	X	X	√	√	√	X	Occasional

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147	*Biophytum petersianum*	X	X	√	X	X	√	√	√	X	Occasional
148	*Alysicarpus vaginalis*	X	X	√	X	X	√	√	√	X	Occasional
149	*Cissus ivorens*	√	√	√	X	√	√	X	√	√	Frequent
150	*Sporobolus pyramidalis*	X	X	√	X	X	√	√	√	X	Occasional
151	*Securidaca longepedunculata*	X	X	√	X	X	√	√	√	X	Occasional
152	*Kigelia africana*	√	√	√	X	√	√	X	√	√	Frequent
153	*Tecoma stans*	X	X	X	√	X	X	X	X	X	Rare
154	*Solanum dasyphyllum*	√	√	√	X	√	√	X	√	√	Frequent
155	*Cyperus spp*	√	X	√	√	√	√	√	X	√	Frequent
156	*Panicum spp*	X	X	√	√	√	√	X	√	√	Frequent
157	*Cussonia barteri*	√	X	√	√	√	√	√	√	√	Abundant
158	*Ficus capensis*	√	X	√	√	X	√	√	√	√	Frequent
159	*Boswellia dalzielii*	√	X	√	√	X	√	√	√	√	Frequent
160	*Lannea kerstingii*	√	X	√	√	X	√	X	√	√	Occasional
161	*Monechma ciliatum*	√	X	√	√	X	√	√	√	√	Frequent
162	*Trema orientalis*	√	X	√	√	X	√	X	X	√	Occasional
163	*Euphorbia poissonii*	√	√	√	√	√	X	√	√	√	Frequent
164	*Sida spp*	√	√	√	√	√	√	√	√	√	Very abundant
165	*Gynandropsis gynandra*	√	X	√	√	X	√	X	√	√	Frequent
166	*Petrocarpus erinaceus*	√	√	√	√	X	√	X	√	√	Frequent
167	*Setaria pallidefusca*	X	X	√	√	X	√	X	X	√	Occasional
168	*Setaria pallidefusca*	√	X	X	√	X	√	X	X	√	Occasional
169	*Dactyloctenium aegyptium*	√	X	√	√	√	X	√	√	√	Frequent
170	*Celosia argentea*	√	√	√	√	√	√	√	√	√	Abundant
171	*Brachiaria spp*	X	X	√	√	√	X	X	√	√	Occasional
172	*Azadiractha indica*	√	√	√	√	√	√	√	√	√	Very abundant
173	*Eragrostis gangetica*	√	√	√	√	√	√	√	√	√	Abundant
174	*Citrullus vulgaris*	√	X	√	√	√	√	X	√	√	Frequent
175	*Hygrophila spinosa*	√	X	√	√	X	√	X	√	√	Frequent
176	*Desmodiun spp*	X	X	√	√	√	√	X	√	√	Frequent
177	*Panicum spp*	√	√	√	√	√	√	√	√	X	Abundant
178	*Amarathus spinosus*	√	X	√	√	√	√	√	√	√	Frequent
179	*Sanseviera liberica*	√	X	√	√	√	√	√	√	√	Abundant
180	*Lycopersicon esculentum*	X	√	X	√	X	√	√	X	√	Occasional
181	*Pennisetum typhoides*	√	√	√	X	X	√	√	X	X	Occasional
182	*Corchorus spp*	X	√	√	X	X	√	√	X	√	Occasional
183	*Physalis angulata*	√	√	√	X	X	√	√	X	√	Occasional

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184	*Eclipta alba*	√	√	√	X	X	√	√	X	X	Occasional
185	*Boerohevia spp*	√	√	√	X	X	√	√	X	X	Occasional
186	*Cassia occidentalis*	√	√	√	X	X	√	√	X	√	Frequent
187	*Cynodon dactylon*	X	√	√	X	X	√	√	X	√	Frequent
188	*Swenkia americana*	X	√	√	X	X	√	√	√	X	Frequent
189	*Luffa cylindrica*	X	√	√	X	X	√	√	X	√	Occasional
190	*Ocimum basilicum*	X	√	√	X	X	√	√	X	X	Occasional
191	*Momordica charantia*	X	√	√	X	X	√	X	X	√	Occasional
192	*Mitrygina inermis*	√	√	√	X	X	√	X	X	√	Occasional
193	*Khaya seneganlensis*	√	√	√	X	X	√	√	X	√	Frequent
194	*Trianthema portulacastrum*	X	√	√	X	X	√	X	X	√	Occasional
195	*Combretum platypterum*	√	√	√	X	X	√	X	X	√	Frequent
196	*Eucalyptus globulus*	√	√	√	√	X	√	√	X	√	Abundant
197	*Burkea africana*	√	√	√	X	X	√	√	X	X	Frequent
198	*Striga hermonthica*	X	√	√	√	X	√	√	√	√	Frequent
199	*Sesamum indicum*	X	√	√	√	X	√	√	√	√	Frequent
200	*Ricinus communis*	X	√	√	√	X	√	√	X	√	Frequent
201	*Hibiscus sabdariffa*	√	√	√	√	X	√	√	√	√	Abundant
202	*Jondov plante*	√	√	X	√	X	√	X	√	√	Occasional
203	*Calotropis procera*	√	√	√	√	√	√	√	√	√	Abundant
204	*Commelina benghalensis*	X	√	X	√	X	√	X	√	√	Occasional
205	*Boerrhavia diffusa*	X	√	X	√	X	√	X	√	X	Occasional
206	*Acanthospermum hispidum*	√	√	X	√	X	√	X	√	√	Frequent
207	*Indigofera hirsuta*	X	√	X	√	X	√	X	√	√	Occasional
208	*Altenanthera sessilis*	√	√	√	√	X	√	X	√	√	Frequent
209	*Corchorus tridens*	X	√	X	√	X	√	X	√	√	Occasional
210	*Ficus thonningi*	√	√	√	√	X	√	√	√	√	Abundant
211	*Dracaena smithin*	X	√	X	√	X	√	X	√	√	Occasional
212	*Tridax procumbens*	√	√	√	√	X	√	X	√	√	Frequent
213	*Ficus trichopoda*	√	√	√	√	√	X	X	√	√	Frequent
214	*Berlinia grandifolia*	√	√	√	√	√	X	X	√	√	Abundant
215	*Senna alata*	X	√	X	√	X	√	X	√	X	Occasional
216	*Crotalaria spp*	X	√	X	√	X	√	X	√	X	Occasional
217	*Ficus spp*	X	√	X	√	X	√	√	√	X	Occasional
218	*Terminalia glaucescens*	√	X	√	√	X	√	√	√	√	Frequent
219	*Andropogon spp*	√	X	√	√	√	√	√	√	√	Frequent
220	*Ficus polita*	√	√	√	√	√	X	√	√	√	Abundant

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221	*Bambusa vulgaris*	X	X	X	√	X	√	X	√	X	Occasional
222	*Plumeria rubra*	X	√	X	√	X	X	X	√	X	Occasional
223	*Datura stramonium*	X	X	X	√	X	√	X	√	X	Occasional
224	*Lagenaria siceraria*	X	√	X	X	X	√	X	√	X	Occasional
225	*Gossypium barbadens*	X	√	X	X	X	√	X	√	X	Occasional
226	*Terminalia catapa*	√	√	X	X	X	√	X	√	X	Occasional
227	*Spondias monbim*	X	X	X	X	X	√	X	√	X	Occasional
228	*Delonix regia*	X	X	X	X	X	√	√	√	X	Occasional
229	*Indigofera arrecta*	X	X	X	X	X	√	X	√	X	Occasional
230	*Jatropha gossypiifolia*	√	X	√	√	√	√	√	√	X	Abundant
231	*Sesbania sesban*	√	X	X	X	X	√	X	√	√	Frequent
232	*Albizia lebbeck*	√	X	X	X	X	√	X	√	X	Occasional
233	*Desmodium mumme*	√	X	X	√	X	√	X	√	√	Occasional
234	*Balanites aegyptiaca*	√	X	√	√	X	√	X	√	√	Frequent
235	*Setaria barbata*	√	X	X	√	√	√	X	√	√	Occasional
236	*Phyllanthus amarus*	X	X	X	X	√	X	X	X	X	Rare
237	*Ceiba pentandra*	√	X	X	√	√	√	X	√	X	Occasional
238	*Digitaria horizontalis*	√	X	X	√	√	X	X	√	X	Occasional
239	*Euphorbia heterophylla*	√	X	X	√	√	X	X	√	X	Occasional
240	*Portulaca oleracea*	X	X	X	√	√	√	X	√	X	Occasional
241	*Desmodium uncinatum*	√	X	√	√	√	√	X	√	X	Frequent
242	*Chloris pilosa*	X	X	X	X	√	√	X	√	X	Occasional
	Synedrella nodiflora	X	X	X	√	√	X	X	√	X	Occasional
243	*Ipomoea aquatica*	√	X	√	√	√	√	X	√	√	Frequent
244	*Ziziphus mucronata*	X	X	X	X	√	X	X	√	X	Occasional
245	*Syzychirium spp*	√	X	√	X	√	√	X	√	√	Frequent
246	*Terminalia superba*	X	√	√	√	√	√	X	√	√	Abundant
247	*Stylosanthes micronata*	X	√	√	√	√	√	X	√	√	Abundant
248	*Anthocleista djalonensis*	X	X	X	√	√	√	X	√	X	Occasional
249	*Borreria verticillata*	√	X	X	√	√	√	X	√	X	Occasional
250	*Cassia siamea*	√	X	√	√	√	√	√	√	√	Frequent
251	*Moringa oleifera*	√	√	√	√	√	√	√	√	√	Abundant
252	*Carica papaya*	√	√	√	√	√	√	√	√	√	Abundant
253	*Sesame indica*	√	X	√	√	X	√	√	√	√	Abundant
254	*Heliotropium indicum*	X	X	X	X	√	X	√	√	√	Occasional
255	*Sida rhombifolia*										
256	*Asystasia*	√	√	√	√	√	√	√	√	√	Abundant

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	gangetica										
257	*Hypoestes cancellata*										
258	*Vernonia ambigua*	√	√	X	√	X	√	X	√	√	Frequent
259	*Echinochloa spp*	X	X	√	√	√	√	√	X	√	Frequent
260	*Ochna schweinfurthiana*	X	X	√	√	√	√	√	X	√	Frequent
261	*Mussaenda spp*	X	X	√	X	√	X	√	√	√	Frequent
262	*Erigeron floribundus*	X	X	√	X	√	X	√	X	√	Occasional
263	*Cyperus rotundus*	√	√	√	√	√	√	√	√	√	Very abundant
264	*Vernonia migeodii*	X	X	√	X	√	X	√	√	√	Frequent
265	*Oldenlandia corymbosa*	√	X	√	X	X	X	√	X	√	Occasional
266	*Triumfetta cordifolia*	√	√	X	X	X	X	√	X	√	Occasional
267	*Olax subscorpioides*	X	X	X	X	X	X	X	X	√	Rare
268	*Setaria pumila*	√	X	√	X	√	X	√	√	√	Frequent
269	*Sida linifolia*	√	X	X	X	X	X	√	√	X	Occasional
270	*Phaulopsis barteri*	√	X	X	X	X	X	X	√	√	Occasional
271	*Scoparca dulas*	√	X	X	X	X	X	√	X	√	Occasional
272	*Euphorbia tithymaloides*	√	X	√	√	X	X	X	X	√	Occasional
273	*Oplismenus burmanni*	√	X	√	X	√	X	√	√	√	Frequent
274	*Luffa cylindrica*	√	X	√	√	X	√	X	X	√	Occasional
275	*Tithonia diversifolia*	√	√	√	√	√	√	√	√	√	Very Abundant

Key: √ means present, X means absent

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Table 2: Percentage Distribution of the life forms of Plants in Nasarawa State

HABIT	LOCAL GOVERNEMENT AREAS								
	AKWANGA	AWE	KEFFI	KOKONA	NASARAWA	NASARAWA EGGON	OBI	TOTO	WAMBA
PERCENTAGE OF HERBS, CLIMBERS AND GRASSES	25.71%	36.36 %	16.67%	39.39%	31.25%	47.62%	44.44%	29.27%	45.98%
PERCENTAGE OF SHRUBS	18.57%	18.18 %	33.33%	9.09%	6.25%	4.76%	22.22%	14.63%	19.54%
PERCENTAGE OF TREES	55.71%	45.45 %	50%	51.52%	62.5%	47.62%	27.78%	56.09%	34.48%

Table 3: Percentage Occurrence of Plant Families

S/N	NAME OF FAMILY	PERCENTAGE IN LOCAL GOVERNEMENT AREAS									OVERALL PERCENTAGE
		AKWANGA	AWE	KEFFI	KOKONA	NASARAWA	NASARAWA EGGON	OBI	TOTO	WAMBA	
1	Acanthaceae	0	0	0	0	0	3.33%	0	0	0.94%	0.47%
2	Agavaceae	0	100%	0	0	0	0	0	0	0	11.11%
3	Anonnaceae	2.5%	0	0	2.32%	2.85%	0	4%	3.03%	2.83%	1.95%
4	Ampelidaceae	0	0	0	0	0	0	0	0	100%	11.11%
5	Asteraceae	7.5%	10%	9.5%	2.32%	2.85%	3.33%	4%	3.03%	6.6%	5.46%
6	Apocynaceae	2.5%	0	0	4.65%	2.85%	0	0	3.03%	1.89%	1.66%
7	Araceae	2.5%	0	0	2.32%	2.85%	3.33%	4%	3.03%	0.94%	2.11%
8	Araliaceae	0	0	0	0	0	100%	0	0	0	11.11%
9	Arecaceae	7.5%	0	0	0	0	0	0	0	0.94%	0.94%
10	Asclepiadaceae	0	0	0	0	0	0	4%	0	0.94%	0.55%
11	Amaranthaceae	0	5%	0	2.32%	0	3.33%	0	0	1.89%	1.39%
12	Anacardiaceae	2.5%	0	0	4.65%	5.71%	3.33%	4%	6.06%	0.94%	3.02%
13	Balanitaceae	0	0	0	0	100%	0	0	0	0	11.11%
14	Bignoniaceae	0	0	4.8%	4.65%	0	0	0	0	0.94%	1.15%
15	Bombacaceae	0	0	0	0	2.85%	0	0	3.03%	0.94%	0.76%
16	Boraginaceae	0	0	0	0	25%	0	25%	25%	25%	11.11%
17	Burseraceae	0	0	0	0	0	100%	0	0	0	11.11%
18	Caesalpiniaceae	7.5%	10%	4.8%	2.32%	2.85%	0	4%	9.09%	6.6%	5.24%
19	Capparidaceae	0	0	0	0	0	100%	0	0	0	11.11%
20	Cochlospermaceae	100%	0	0	0	0	0	0	0	0	11.11%
21	Combretaceae	0	0	4.8%	2.32%	2.85%	3.33%	4%	6.06%	1.89%	2.81%
22	Commelinaceae	0	0	0	2.32%	0	0	4%	0	0	0.7%
23	Connaraceae	2.5%	0	0	0	0	0	0	0	0.94%	0.38%
24	Convolvulaceae	2.5%	0	14.3 %	4.65%	2.85%	3.33%	4%	3.03%	2.83%	4.17%
25	Cucurbitaceae	0	15%	4.8%	4.65%	2.85%	3.33%	0	3.03%	0	3.74%
26	Cyperaceae	0	0	9.5%	6.98%	2.85%	6.67%	4%	3.03%	0.94%	3.77%
27	Dioscoreaceae	0	0	0	2.32%	2.85%	3.33%	4%	0	3.77%	1.81%
28	Euphorbiaceae	2.5%	0	4.8%	2.32%	8.57%	3.33%	4%	3.03%	5%	3.73%
29	Fabaceae	5%	5%	4.8%	2.32%	2.85%	3.33%	4%	3.03%	3.77%	3.79%

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30	Hymenocardiaceae	0	0	0	0	0	0	0	0	100%	11.11%
31	Lamiaceae	0	5%	0	0	0	0	0	0	1.89%	0.77%
32	Liliaceae	0	0	0	100%	0	0	0	0	0	11.11%
33	Loganiaceae	0	0	100 %	0	0	0	0	0	0	11.11%
34	Loranthaceae	0	0	0	0	0	0	0	0	100%	11.11%
35	Malvaceae	7.5%	0	4.8%	4.65%	2.85%	10%	4%	6.06%	1.89%	4.64%
36	Meliaceae	2.5%	10%	0	2.32%	0	0	0	3.03%	0	1.98%
37	Menispermaceae	0	0	0	0	0	0	0	0	100%	11.11%
38	Mimosaceae	2.5%	0	4.8%	2.32%	2.85%	3.33%	4%	3.03%	2.83%	2.85%
39	Moraceae	2.5%	0	4.8%	2.32%	5.71%	3.33%	0	12.1%	1.89%	3.63%
40	Myrtaceae	0	0	0	2.32%	0	3.33%	4%	6.06%	1.89%	1.96%
41	Musaceae	0	0	0	4.65%	2.85%	3.33%	0	0	0.94%	1.31%
42	Nyctaginaceae	2.5%	0	0	0	0	0	8%	0	0.94%	1.27%
43	Ochnaceae	0	0	0	0	0	0	0	0	100%	11.11%
44	Olacaceae	0	0	0	0	0	0	0	0	100%	11.11%
45	Papilionaceae	7.5%	0	4.8%	6.98%	2.85%	3.33%	4%	3.03%	8.49%	4.55%
46	Pedaliaceae	0	0	0	0	0	0	4%	0	0.94%	0.55%
47	Poaceae	7.5%	20%	9.5%	9.3%	5.71%	10%	4%	6.06%	14.2%	9.59%
48	Portulacaceae	0	0	0	0	100%	0	0	0	0	11.11%
49	Rhamnaceae	0	0	0	0	100%	0	0	0	0	11.11%
50	Rubiaceae	2.5%	0	0	0	0	0	0	0	3.77%	0.69%
51	Rutaceae	2.5%	0	0	2.32%	2.85%	3.33%	4%	0	0.94%	1.77%
52	Sapotaceae	2.5%	0	0	0	0	0	0	0	0.94%	0.38%
53	Sapindaceae	0	0	0	0	0	0	0	0	100%	11.11%
54	Scrophulariaceae	33.33%	0	0	0	0	0	33.33%	0	33.33%	11.11%
55	Smilaceae	100%	0	0	0	0	0	0	0	0	11.11%
56	Solanaceae	2.5%	10%	4.8%	2.32%	5.71%	3.33%	4%	3.03%	0.94%	4.07%
57	Sterculiaceae	2.5%	0	0	2.32%	2.85%	0	0	0	0.94%	0.96%
58	Tiliaceae	2.5%	5%	0	0	0	0	4%	0	0.94%	1.38%
59	Verbanaceae	5%	0	0	0	5.71%	3.33%	4%	6.06%	1.89%	2.89%
60	Vitaceae	0	0	0	100%	0	0	0	0	0	11.11%
61	Zingiberaceae	0	0	0	0	0	0	0	0	100%	11.11%

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Table 4: The Predominant Food Crops in all the Local Governments

S/N	LOCAL GOVERNMENT AREA	PREDOMINANT FOOD CROP
1	AKWANGA	*Sorghum bicolor*
2	AWE	*Sorghum bicolor*
3	KEFFI	*Sorghum bicolor*
4	KOKONA	*Sorghum bicolor*
5	NASARAWA	*Sorghum bicolor*
6	NASARAWA EGGON	*Curcubita spp* and *Sorghum*
7	OBI	*Sorghum bicolor*
8	TOTO	*Sorghum bicolor* and *Sesame indica.*
9	WAMBA	*Musa sapientum* and *Zea mays*

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