



**Original Article**

**A SURVEY OF ETHNO-BOTANICAL SPECIES OF SUPPORT ZONE COMMUNITIES OF  
YANKARI GAME RESERVE, BAUCHI, NIGERIA**

\*Muhammad, M<sup>1</sup>., Abdulhameed, A<sup>1</sup>., Abdullahi, M. B<sup>2</sup>. and Adamu, M. P<sup>3</sup>.

1Abubakar Tafawa Balewa University, Bauchi state, Nigeria.

2 Federal University Kashere, Gombe, Nigeria.

3Federal Polytechnic, Bauchi State, Nigeria.

Submitted: March 21, 2014; Accepted: June 06, 2014; Published: June 30, 2014.

**ABSTRACT**

The study was conducted to generate baseline data for the conservation and sustainable use of forest resources in the support zone communities. Extent of anthropogenic activities was determined by distribution of 140 questionnaires in 14 communities, the selection of these communities was based on their proximity to the reserve; through the use of Buffer command in Arc view GIS. From the result, People of the support zone communities interact with plants of Yankari Game Reserve in form of collection of timber and non-timber forest products for firewood, fodder for animals, food and for medicinal purposes. The wide spread use of traditional medicinal plants among both urban and rural population could be attributed to cultural acceptability, efficacy against disease types, physical acceptability and economic affordability as compared to modern medicine. The Survey not only introduces the current research trends, but also arouses new ideas on Ethno-botanical research. There is indeed an urgent need for an official

policy for developing and upgrading local plants used as source of medicines to complement orthodox therapy in Nigeria.

**Keywords:** Biodiversity, Buffer command, Ethno-medicine, Protected area

**Corresponding :** mmjamaare@gmail.com +234856591298, +2348136846444

---

## INTRODUCTION

The global trend of Natural resource exploitation is alarming due largely to anthropogenic activities (Dixon and Sherman, 1987). Natural areas usually serve to preserve flora and fauna and provide opportunities for recreation and research activities. The preservation of natural areas usually entails creation of an environment that is suitable for wild animals and other forms of wildlife to proliferate. These areas often contain a wide variety of genetic resources and support essential ecological functions. The practice of maintaining natural areas for the common good and to protect the resources they contain was uncommon until the last century (Dixon and Sherman, 1987). The international Union for the conservation of Nature and Natural Resources (IUCN) has been in the forefront in the establishment of protected areas. In 1985, the IUCN listed up to 3500 sites as protected areas spread across about 136 countries (Dixon and Sherman, 1987).

The values of the protected areas include among others: commercial, game, aesthetic, ethical, scientific and ecological. In addition to these, natural areas help in the maintenance of the environmental processes such as purification of the air, soil and water system

The primary step to prevent the loss of biodiversity is to identify the regions with high biodiversity and prioritize those areas for conservation. Several

studies have been concentrated in identifying these hotspots in different areas of Yankari National Park (Abdulhameed *et al.*, 2001 and Abdulhameed *et al.*, 2004). The study of spatial distribution and variation of species help conservation planners to identify the areas with exceptional richness.

Ethno-botanical studies are often significant in revealing locally important plant species. Investigations into traditional use and management of local flora have demonstrated the existence of extensive local knowledge of not only about the physical and chemical properties of many plant species, but also their phenological and ecological features (Ibe and Nwufo, 2005). In addition, ethno botanical research has been applied to current areas of study such as biodiversity prospecting and vegetation management (Abdullahi and Ibrahim, 2009). Much of the traditional knowledge about plants, especially medicinal plants, is being lost with time, either because of the lack of studies or by the inadequate use of plant resources. There have been several works on the vegetation of different zones of Nigeria and the world at large, but there is little or no research on the relationship

between anthropogenic activities in the support zone communities. The objective is to determine the ethno-botanical practice of support zone communities. The content of the knowledge that human groups have of their local environment has attracted the interest of researchers since the beginning of the 19th century (Dixon and Sherman, 1987). Initial studies focused on documenting the knowledge itself and how native peoples used to classify their environment. Most of the first studies on quantitative ethno biology focused on the importance of plants, remedies, animals, and ecosystems for specific cultural groups. The major loss of indigenous knowledge in the population of villages is the disruption of the traditional channel of oral communication due to shift to written exchange of communications (Abdullahi and Ibrahim, 2009). This made it difficult for the older generation to pass their knowledge on to the younger generation. Depletion of flora population at an increasing rate is another crucial problem affecting natural resources conservation, meaning that important economic species are being lost.

## MATERIALS AND METHODS

### Description of the Study Site

Yankari game reserve lies in the southern part of the Sudan Savanna located in the North-east part of Nigeria. It covers an area of about 2,244 km<sup>2</sup>; it is

composed of savanna grassland with well-developed patches of woodland. It is also a region of rolling hills, mostly between 200m and 400m (656 and 1313ft). Kariyo hill is the highest point at 640m (2100ft) above sea level. It falls within the latitudes 9°50' N and 10°32'E lying in the south-central area of Bauchi state, the vegetation is composed mainly of Combretaceous trees and shrubs, *Azelia*, *Anogeissus* and *Detarium* savanna woodland. The ethno-botanical populations were collected using a specifically designed questionnaire. Data on parts (leaves, twigs, fruits, pods) of plant species used and ethno-botanical values viz. fodder, medicinal, fibre, food (vegetable, fruit), fuel wood, timber, industrial, tanning and gum were collected. For medicinal uses, in addition to information on the plant parts used, their collection, processing, preparation of drugs, properties of medicine and diseases cured by them were also collected. To achieve this 140 questionnaires were distributed in the 14 communities as: Gar, Mainamaji, Kuka, Babani, Kwala, Malari, Walakerol, Wundo, AlkarinGwana, Kafi, Sabonlayi, Dan Tashandutse and Twara based on their proximity to the reserve.

These Villages were selected using a GIS software (Arch view) through Buffer system. When the map of Alkaleri L.G.A was imported into the Arch view environment showing all the villages as well as the boundary of the game reserve. A proximity command known as Buffer was used in generating a zone of

equi-distance from the centre of the reserve.

### Procedure

This was achieved through the following process as:

- The map of Alkaleri L.G was converted into shape file
- The theme for Alkaleri LG was high lighted
- Create buffers command was clicked through the theme menu
- In the buffer window that opens 5km was typed and ok was clicked
- Create buffer command was clicked through the theme menu.
- From the center of the game reserve, 5km away was demarcated by the software.
- In the buffer dialogue box that opens 10km was typed and ok was clicked
- From the center of the reserve 10km away were demarcated

But the area of concern was from 0km away from the center of the reserve to 10km away from the center of the reserve. Therefore the village that appeared within this ranges 0-10km are villages of interest for this study as shown in figure 1. Then systematic sampling method was used to sample the houses i.e. a uniform interval of one to house(s) was given from the first house to next house where the questionnaire was administered (Aronoff, 1991)

140 questionnaires were distributed in 14 communities of the support zone area, the selection of these communities was based on their proximity to the reserve and this was achieved through the use of Buffer system in Arch view GIS, then systematic sampling method was used to obtain the target population (respondents). Out of the 140 questionnaire distributed 132 were returned which constitute about 94%, and the responses were) take to materials and methods

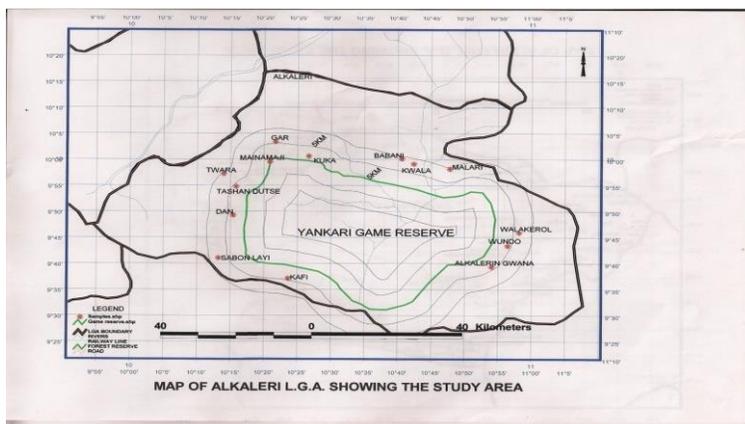


Figure1: Map of Alkaleri LGA showing YGR and the 14 communities selected using Buffer command in Arch view GIS (within the range of 0-10km)

## RESULTS

Table 1 below showed the percentage of households of the support zone communities in relation to the plant resources usage. Most of the people depend on the reserve for fuel wood. 75% obtained their fuel wood from the reserve, 74.2% obtained their fodder from the reserve, and 65.9% took their animals for grazing into the reserve while 79.5% obtained their medicinal plants from the reserve.

#Table 1: The number and percentage of households (n=132) mentioning the use of the reserve resources

Questions	Response	Percentage (%)
Where do you get fuel wood from?		
Reserve	99	75
Own field	18	13.6
Outside reserve	10	7.5
Outside own field	5	3.9
Where do you get fodder from?		
Reserve	98	74.2
Others	34	25.8
Where do you take your livestock for grazing?		
Reserve	20	15.2
Open grazing lands	87	65.9
Others	25	18.9
Do you collect medicinal plants or any other products		
From the reserve		
No	27	20.5
Yes	105	79.5

Table 2 below showed the Twenty (20) Ethno-medicinally important plant species documented in Yankari Game Reserve. These ethno- botanical and medicinal plant species belonged to fourteen families. The family Caesalpiniaceae had six species and the rest had one species each. This does not mean the family Caesalpiniaceae is the most important but showed the diverse nature of the different plant species which belongs to this particular family. Most plants are use for treating more than one ailment.

Table 2: Plant species studied for ethno-botanical aspect in support zone communities

Family	Species	Common name ( Hausa)
Anacardiaceae	<i>Lannea acida</i> A. Rich.	Faru
Annonaceae	<i>Annona senegalensis</i> Pers.	Gwandardaji
Arecaceae	<i>Borassus aethiopum</i> C. Martius	Giginya
Bombacaceae	<i>Adansonia digitata</i> L.	Kuka
Burseraceae	<i>Boswellia dalzelli</i> Hutch.	Ararrabi
Caesalpinaceae	<i>Afzelia africana</i> Sm.	Kawo
Caesalpinaceae	<i>Detarium microcarpum</i> Guill & Perr	Taura
Caesalpinaceae	<i>Piliostigma thonningii</i> (Schumach. & Thonn.)	Kargo
Caesalpinaceae	<i>Tamarindus indica</i> L.	Tsamiya
Combretaceae	<i>Anogeissus leiocarpus</i> (DC) Guill. & Perr.	Marke
Ebenaceae	<i>Diospyros mespiliformis</i> ex A DC.	Kanya
Fabaceae	<i>Isobertinia doka</i> Craib & Stapt	Doka
Leguminosae	<i>aniellia oliveri</i> Hutch & Dalziel	Maje
Meliaceae	<i>Azadirachta indica</i> A.Juss	Maina
Meliaceae	<i>Khaya senegalensis</i> (Ders.) A. Juss	Madaci
Mimosaceae	<i>Acacia seyal</i> Delile	Dushe
Mimosaceae	<i>Parkia biglobosa</i> (Jacq)R.Br.ex G.Don	Dorawa
Mimosaceae	<i>Prosopis africana</i> (Guill&Perr) Taub.	Kirya
Tiliaceae	<i>Grewia mollis</i> A.Juss	Dargaji
Verbenaceae	<i>Vitex doniana</i> Sweet	Danya

Source: Geerling, (1983)

Table 3 below showed how these plants were prepared and used in the treatment of different ailments. The preparation often involve the inclusion of ancillary items such potash and ginger (*Zingiber officinale* roscoe). The remedies are taken either as decoction or administered directly to the infected parts. Others were mixed with various plant species parts. The most widely

used parts of the plants in this region are the bark, followed by the leaves and the roots.. Seed and fruits are not commonly used in preparation of decoctions for treatment ailments. The mode of administration ranges from drinking or bathing with the preparations, chewing and sitting atop the prescription among others.

Table 3: Medicinal plants and their uses at the support zone communities

Species	Part used	Ailment treated	Preparation	Administration
<i>Acacia seyal</i> Delile	Bark	Toothache, body pain	Bark is cooked alone	Fluid is drunk
<i>Adansonia digitata</i> L.	Bark	Toothache, cough	Bark is soaked in water	By drinking and bathing with water
<i>Annona senegalensis</i> Pers.	Leaf	Wounds	Young shoots and leaves are squeezed to generate juice	Juice applied on affected area of wounds
<i>Anogeissus leiocarpus</i> (DC.) Guill. & Perr.	Bark	Stomachache and worms	Bark is dried, ground, then boiled	Fluid is drunk
<i>Boswellia dalzielii</i> Hutch.	bark, leaf	Piles, stomach-ache and worms	Bark is dried, pounded then soaked in H <sub>2</sub> O.	Fluid is used for bathing twice a day
<i>Khaya senegalensis</i> (Desr.) A. Juss.	Bark	Piles and stomachache	Bark is pounded and soaked in water	Fluid is drunk
<i>Kigelia africana</i> (Lam.) Benth.	root, bark, fruit	Reduction of high blood pressure, stomach ache, yellow fever	Roots, bark and fruit are peeled and cooked to make a concoction	The concoction is drunk
<i>Burkea africana</i> Hook.	leaf, bark	Stomachache, body weakness and joint pain	Bark and leaves are boiled together or the bark is soaked alone	Fluid is used for bathing. The soaked bark is drunk

Source: Geerling, (1983)

### DISCUSSION

The study reveals that medicinal plants account for a larger proportion of respondents' dependence on the protected area. This could be attributed to the fact that the primary occupation of the local community is agriculture, largely farming activities which in effect

reduces the need for forest foods (Abdullahi and Ibrahim, 2009). Kirige (2005), and , Amusa *et.al*, (2010) noted that the use of traditional medicine is prevalent among rural communities of Africa. They have immense knowledge on ethno-medicine, although its use is rapidly diminishing partly due to lifestyle changes and exposure to

Western ideologies. Eleven ailments from fourteen species have been documented in this study, with some species overlapping in the treatment of the same ailment. This agrees with the report on traditional knowledge systems of plants in India (Kala, 2005). Generally, several factors persist to account for dependency on traditional medicine. Traditional medicine, unlike modern medicine is an integral component of many cultures which has evolved for many generations, and it is considered effective in treating and managing certain cultural health problems (Sindiga, 1994). It is also considered efficacious, readily acceptable by the community and as well as holistic in its approach to addressing health problems. Further, it is cost effective and traditional healers charge affordable fees. Also, most rural communities of Africa do not see any danger associated with the use of herbal remedies. In fact, initial home treatment of sick persons using herbal remedies is a common practice among african communities ( Iwu, 1993, Sindiga, 1994 and Brown, 1995). Meanwhile, some of the medicinal plants in this study are considered occasional and rare. This raises concern about the need for both short and long term intervention strategies to save the species into the future. More so, over 80% of Nigerians are reported to depend on herbal medicines (Ugbogu, 2005), while healthcare is still beyond the reach of a good proportion of the rural population.

## REFERENCES

- Abdulhameed, A., Sabo, A., Gani, A. M. and Sanusi, S .S. (2001). Phytosociological studies of asite Adjoining Yankari National Park, Bauchi state, Nigeria. *Research Journal of Science*, 7:(12): 7-16.
- Abdulhameed, A., Sanusi S. S, and Abdullahi M. B. (2004). The Influence of Human activities on the Floristic characteristics of Woody Plants within and outside Yankari National Park, Bauchi State, Nigeria. *Nigerian Journal of Botany*, 1 (8). 203-213.
- Abdullahi, M. B. and Ibrahim D. B. (2009). Local People knowledge and attitudes toward Maladumba Lake and Forest Reserve (MLFR) MisauBauchi state, Nigeria. *International Journal of Agriculture*, 1(1): 64-70.
- Amusa, T. O, Jimoh, S. O, Aridanzi, P. and Haruna, M. (2010). Ethno botany and Conservation of Plant Resources of Kainji Lake National Park, Nigeria. *A journal of plant people and applied research*, 8(18): 190-194 .
- Aronoff, S. (1991). *Geographic Information Systems: a Management Perspective*. WDL Publications. ISBN 0-921804-91-1 pp 176-184
- Bhatnagar, P. (2002). Conservation and trade of medicinal herbs: A study of Safed Musli (*Chlorophytum* spp.) in

Madhya Pradesh. *Sustainable Forestry*, 7:11-14.

Brown, K. (1995). Medicinal plants, indigenous medicine and conservation of biodiversity in Ghana. 201-231 in *Intellectual Property Rights and Biodiversity Conservation*, Edited by T. Swanson. Cambridge University Press, London. PP 652

Dixon, J. A. and Sherman, P. B. (1987). *Economic of protected Areas: A new look at Benefits and Costs*. Published by island press PP 657

Geerling, C. (1983). Vegetation and herbivores in Yankari. *Nigerian Field*, 47(4): 167-184.

Ibe, A. E. and Nwifo, M. I. (2005). Identification, collection and identification of medicinal plants in southeastern Nigeria. *Journal of African Development*, 30: 66-77.

Iwu, M. I. (1993). *Handbook of African Medicinal Plants*. CRC Press, Boca Rotan, Florida

Sheley. R., Roberts, E. and Cooksey, D. (1999). Montana Noxious Weed Survey and Mapping System. *Weed Mapping Handbook*. Bozeman, MT, Montana State University. PP 321.

Sidinga, I. (1994). Indigenous medical knowledge of the Maasai. *Indigenous Knowledge and Development Monitor* 2:16-18.

WHO. (1978). The Promotion and Development of Traditional Medicine. *Report of World Health Organization meeting*, No. 622. World Health Organization, Geneva. PP 231