# Exploring Ethno-botanicals and Indigenous Knowledge Practices among Rural Dwellers in the Savanna Zone of Osun State, Nigeria

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***Abstract***
*Rural people are the custodians of Indigenous Knowledge Systems (IKS) and these are deeply embedded in their local culture. This article explores ethno-botanicals and indigenous knowledge practices in crop and ruminant animal production among rural dwellers in the Savanna zone of Osun State, Nigeria. Multistage sampling procedure and purposive sampling technique was used to select 125 from 10 rural communities across the eight LGAs that constituted the Savanna zone of Osun State. The field work involved the use of interview schedule to elicit primary data and Key informants' interview. In addition, descriptive statistics were used to describe the data whereas Pearson Product-Moment Correlation were used in making inferential deductions. The results show that the mean age was 42 years and above average (52.8%) were male while majority (94.4%) were married. Furthermore, about (72.0%) of the farmers used Nicotiana tobaccum in treating lice while just (46.4%) used Ancchormanes differmis (Ogirisoko) as dressing materials. In addition, majority (80%) had no proper documentation of IKS (80.1%) and about (71.2%) viewed the that effects of environmental degradation were the major constraint. The study was concluded with the veracity of ethno-botanical usage in the study area. Botanists and development workers should take inventories and harmonize ethno-botanicals with modern science to evolve a diversified technology base.*

***Keywords:*** *Utilisation, ethno-botanicals, indigenous knowledge systems, crop and ruminant production.*

## INTRODUCTION

From ancient times, man has been using plants as sources of food, medicine and to attend to some basic's necessities of life. In Nigeria and Mali, Ghana and Zambia, the first choice for 60% children suffering with high malarial fever is herbal medicines (Aziz, Adnan, and Khan (2018). Plants that possess therapeutic properties or exert beneficial pharmacological effects on the animal body are generally designated as medicinal plants. It is now established that the plant which naturally synthesizes and accumulates some secondary metabolites like alkaloids, tannin, glycoside vitamins and volatile oils, possess medicinal properties (Muhammad, 2016). Medicinal plants constitute an important natural wealth of a society. It has been documented by indigenous knowledge scholars that medicinal plants also play a significant role in providing primary health care services to rural people. They serve as therapeutic agents as well as

important raw materials for modern medicines and substantial amount of foreign exchange can be earned by exporting medicinal plants to other countries.

Furthermore, Strivastava *et al*. (2018) alluded to the significant role that indigenous knowledge played in the economy of a country and that ethno-botanical studies have provided a lot of information about different uses of plants prevalent among tribes and natives of Nigeria. Mannar *et al*. (2008) in the same vein reported an increasing interest in the scientific study of interaction between man and plant which is clearly visible among the rural folk.

Today, ethno-botanicals have become an important and crucial area of research and development especially in health management, biodiversity conservation and ecosystem level. The ancient medical knowledge of various tribes and folklore systems sometimes referred to as ethno-therapeutics have therefore provided a powerful and more effective strategy for the discovery of clinically useful compounds (Shrivastava, 2018). A number of ethno-botanicals have been found and put to use and had significantly improved the health status of the rural dwellers.

Tropics and sub-tropical parts of the world are richly endowed with abundant natural, physical and human resources but these resources had not been harnessed to its full potential because of the assumed superiority of western science over indigenous knowledge. Indigenous knowledge is now gaining more attention in developed world, as a significant field of human effort that has long existed in indigenous societies.

Indigenous knowledge system consists of established practices that was responsible for the survival of a given society for generations before the introduction of modern scientific inventions. It is a systematic body of knowledge acquired by local people through the accumulation of experience, informal experiments, and intimate understanding of the environment in a given culture. Despite being frequently seen as a resource for the poor, plants have always played a crucial role in human culture (Aziz et al., 2018).

Indigenous agricultural and environmental knowledge in solving local problems was recognized by the United Conference on Environment and Development (UNCED) in 1992. The appeals for paying attention to local knowledge to conserve ecosystems are now common, because despite all the advances in the formal ecological sciences and other institutional developments, the location specific recipe for conservation seems to elude the global managers. For instance, ethno-veterinary medicine differs not only from region to region but also among and within communities. In order to control various pests and diseases of small ruminants, ethno-veterinary medicine is widely practiced by village farmers (Dewes, 1993). Recognition of the role of ethno botanicals and indigenous knowledge systems in solving local problems most especially among the rural household involved in crop production and small ruminant's production was the focus of this study. The study described the personal characteristics of the rural dwellers in the study area; identified the ethno-botanicals and IKPs utilized among rural dwellers in crop and small ruminants' production and identified the constraints associated with the use of ethno-botanicals and IKPs in crop and small ruminants' production in the study area.

**Methodology**

This study was carried out in the rural communities of the Savanna Zone of Osun State, situated in south western part of Nigeria. It lies within Longitudes $4^{O}$C 30E and Latitudes $7^{O}$ C $30^{o}$ N. Osun State covers an estimated land area of 9,251 square kilometers in which savanna constituted the highest percentage of (about 60%). The people were mainly farmers. Crops cultivated in the state include yam, maize, cassava, guinea corn, cocoa, kolanut, cashew, plaintain, citrus and vegetables. Animals such as poultry, pigs, sheep and goats are kept for consumption and sales. The populations are predominantly Yoruba ethnic group.

The savanna zone of Osun State was purposively selected based on the highest concentration of rural communities in the zone. Multi-stage sampling method was used to select samples for the study. The first stage involved the purposive selection of eight LGAS in the zone because of the concentration of rural communities. The second stage involved a random selection of two communities from each of the LGAs making 16 communities. The third stage is the random selection of 2% of the 6,250 rural dwellers making a total of 125 respondents using Agricultural Development Programme (ADP) farmers list. Simple descriptive statistical techniques such as frequency, percentages and measures of central tendencies were used to describe the data collected. Key informants' interview was used to strengthen quantitative findings. In addition, Pearson's Moment Correlation was employed in making inferential deductions.

The dependent variable for this study was level of usage of ethno-botanicals and IKPs in crop and small ruminants' production. This was measured by asking the respondents to identify the ethno-botanicals and IKPs in crop and small ruminants used from a list of 16 usage provided (4 in crop production, 4 in storing rice, 3 in ecto parasite in small ruminant animal and 5 in ecto parasite in small ruminant animal) and to indicate the level of usage, mean and standard deviation was used to categorise it into high and low. To determine the constraints to usage, a list of 4 constraints hindering the usage were provided.

**Table 1: Summary of different Plants species used in the study area**.

| **Botanical Name of Plants** | **Local Name** | **Life forms** | **Family** |
|---|---|---|---|
| *Chlorophora excelsa* | Iroko | Tree | Moraceae |
| *Tectonia grandis* | | Tree | Lamiaceae |
| *Nephrolepis biseratta* | Omu ope | Herb (fern) | Nephrolepidaceae |
| *Cyclosorus striatus* | Omu oju omi | Herb (**fern)** | Thelypteridaceae |
| *Anchormanes differmis* | Ogirisoko | Herb | Araceae |
| *Datura metel* | Gegemu | Herb | Solanaceae |
| *Azadirachta indica* | Dongoyaro | Tree | Meliaceae |
| *Anogressus leocarpus* | Atare igbo | Tree | Combretacea |
| *Citratus spp* | Osan | Tree | Rutaceae |
| *Nicotiana tabaccum* | Taba | Herb | Solanaceae |
| *Carica papaya* | Ibepe | Tree | Caricaceae |
| *Elaeis guinensis* | Ope | Tree | Arecaceae |
| *Jatropha gossipifollia* | Lapalapa | Shrub | Euphorbiceae |

**Source: Researchers field survey 2021**

## Results and Discussion

### Personal characteristics of the Rural Dwellers

Results in Table 2 shows that the mean age of the rural dwellers were 42 years. Above average (52.8%) of the respondents were male. Also, majority (94.4%) were married. This means rural dwellers have a large percentage of married people in the study area probably for obvious family labour supply. Majority (72.2%) of the respondents had no formal education. The result was in line with the report of Bamigboye (2015) that a vast majority of rural dwellers in rural

savanna of Nigeria were not educated. The result further shows that majority (61.6%) had farm size between 1-2 hectares. This finding is consistent with the report of Nwibo, Mbam, Odoh, Egwu, Uloh, and Oken (2022), who asserted that growing population and the land tenure system were restricting farmers' access to arable land in their study area. Also, the result revealed that above average (52.8%) of the rural dwellers owned goat, (23.2%) owned sheep and (24.0%) owned both sheep and goat. This implies that most of the farmers in the study area rear goat. This might be as a result of economic and cultural value attached to goat rearing in rural communities in Nigeria.

**Table** 2: **Distribution of respondents by age, sex, marital status, years of schooling, farm size, size of herd n=125**

| Variable | Frequency | Percentage | Mean/STD |
|---|---|---|---|
| **Age (in years)** | | | |
| 20-40 | 25 | 20.0 | |
| 40-60 | 79 | 63.2 | 42(19.2) |
| <60 | 21 | 16.8 | |
| **Sex** | | | |
| Female | 59 | 47.2 | |
| Male | 66 | 52.8 | |
| | | | |
| **Marital Status** | | | |
| Single | | | |
| **Single** | 7 | 5.6 | |
| Married | 118 | 94.4 | |
| | | | |
| **Years of schooling** | | | |
| **No education** | 90 | 72.0 | |
| 1-6years | 10 | 8.0 | |
| 7-12years | 12 | 9.6 | |
| 13-18 years | 8 | 6.4 | |
| >18years | 5 | 4.0 | |
| | | | |
| **Farm size** | | | |
| Less than 1Ha | 22 | 17.6 | |
| 1-2 | 77 | 61.6 | |
| 2-3 | 26 | 20.8 | |
| 4and above | 10 | 8.0 | |
| | | | |
| **No of small ruminants owned** | | | |
| Sheep | 29 | 23.2 | |
| Goat | 66 | 52.8 | |
| Both | 30 | 24.0 | |

**Source**: Field survey, 2021

**Ethno botanicals and IKS Used in Crop Production**

Table 3 showed the distribution of the rural dwellers by the types of ethno botanicals being utilized as seed dressing materials for maize and rice. *Ancchormanes diffformis* (Ogirisoko) was

mostly utilized among all the other botanicals that are used as dressing materials (46.4%). Whereas, only (24%) of the respondent claimed that they utilized Otemeje in dressing their seeds prior to planting. Since the plant is poisonous, any soil dwelling insects that comes in contact with the seeds treated with the plant will die. This result was further strengthened by extract from key informant interview conducted with PA Ajani, aged 92 years at Ojo Village near Ede in Osun *State. In the past, odumeje was used to exterminate witches; if a witch was caught, she would have to drink the mixture. However, because Western religion has diminished the power of witches, we are now utilising the plant to protect our seeds from insects that live in them.*

**Table 3**: **Distribution of respondents on the types of ethno botanicals/ IKS being utilized as seed dressing materials for rice and maize**.

| IKS/Ethnobotanicals | Frequency | Percentage |
|---|---|---|
| *A Millicia. exelsia* (Iroko tree) | 23 | 18.4 |
| *B Anchormanes difformis* | 58 | 46.4 |
| C Odumeje | 31 | 24.8 |
| *D Datura metel* | 13 | 10.4 |

**Legend**
IKS: Indigenous knowledge system
A = *Millicia. exelsia* (Iroko tree) the bark is peeled, dried, crushed into powder and mixed with seeds prior planting.
B = *Anchormanes difformis* (ogirisoko) is harvested and soaked in water for 2-3 days, then used for soaking the planting material 6hrs prior planting.. The concoction is effective in controlling termite
C = (Otemeje) (very poisonous) Seeds are crushed into powder and used for seed dressing
D = *Datura metel* (gegemu) seeds are pounded and resulting powder dissolved in water and use as seed dressing materials.

**Types of ethno botanicals /IKS being utilized in storing rice and maize**
The result in Table 4 showed that about 52.0 percent of the farmers use *Azadirachta indica* lotion to store maize and rice. The result was in line with earlier report of Gana (2003) how also reported the effective control of pest of beans and maize using *Azadirachta indica.* Whereas 42.4, 25.6 and 20.0 uses dried orange, fresh *Nicotiana* and *Anogesisus leocarpus* in descending order in controlling store pest of rice and maize. Therefore, it could be inferred from the study that most of the rural dwellers preferred the use of ethnobotanicals in controlling pests because it is less expensive and less hazardous than insecticides.

**Table 4: Distribution of respondents on types of ethno botanicals/ IKS in storing rice and maize**

| Ethno-botanical/IKS | Frequency | Percentage |
|---|---|---|
| *Azadirachta indica* (dongoyaro) used as insecticides for storing maize and rice | 65 | 52.0 |
| Dried orange (*Citrus spp*) peels ground into powder | 53 | 42.4 |
| Fresh *Nicotiana tabacum* (tobacco) leaves **turn to powder** | 32 | 25.6 |
| *Anogeisus leocarbus* shrub dried and burnt into ashes | 25 | 20.0 |

**Multiple responses**
**Source:** Field survey, 2021

**Types of ethno botanicals being utilized for the control of ecto parasites in small ruminants**

The result in Table 5 shows that majority (72.0%) of the farmers used *Nicotiana tobaccum* in treating lice. The result was in consonant with the work of Aladekomo (2011) who reported that fresh tobacco leaves is being used to treat lice in Ife division of Osun State. However, Mange was being used by 56.6 percent of the respondents in the study area. Therefore, it may be concluded that because the commercial medicine is expensive, rural dwellers employ their own indigenous expertise to reduce ectoparasites in small ruminants.

**Table 5: Distribution of respondents according to the types of ethno botanicals /IKS being utilized for the control of ecto parasites in small ruminants n=125**

| Ecto parasite | Ethnobotanical/IKS | Frequency | Percentage |
|---|---|---|---|
| **Lice (*Damalinia ovis)*** | Shea butter (Vitellaria paradoxa) and salt<br>Fresh tobacco leaves<br>Lime juice and early morning urine | 90 | 72.0 |
| **Mange** | Shea butter (Ori) and salt<br>Emiry leaves<br>Palm kernel oil (Adiayan) and sheabutteradiayan | 72 | 57.6 |
| **Tick (*Rhipicephales spp*)** | Birth with jatropha lotion (lapalapa pupa) | 45 | 36.0 |

**Multiple responses**
**Source:** Field survey,2021

**Types of ethno botanicals used for the control of endo parasites in small ruminants**

Palm oil was used by majority (80 .0%) to control diarrhea, larger (73.6 %) use unripe pawpaw, to control mastitis, about (64.8%) used Grounded charcoal to control diarrhea and 61.6 percent used Pawpaw seeds to control worm infestation. This implies that ethnobotanicals were used in controlling different types of endo parasites among the respondents. It could be as a result

of it pharmacological effect and accessibility of materials. The result was in line with the assertion of Sanhokwe, Mupangwa, Masika, Maphosa, and Muchenje (2016) that some of the plants that were being used by farmers to control have been reported to possess pharmacologically active substances.

**Table 6: Distribution of respondents according to the types of ethnobotanicals being utilized for the control of endo parasites in small ruminants**

| Types of ethno botanicals /IKS | Common name | Uses | Frequency | Percentage |
|---|---|---|---|---|
| *Cyclosorus striatus* | Fern | To control poison | 27 | 21.6 |
| Grounded charcoal | - | Diarrhea | 81 | 64.8 |
| Cold palm oil | - | Diarrhea | 100 | 80.0 |
| Unripe pawpaw cut and soak in water | | Mastitis | 92 | 73.6 |
| *Carica papaya* Pawpaw seeds (dried and grounded) | | Worm infestation | 77 | 61.6 |

**Multiple responses**
**Source:** Field survey, 2021

**Level of usage of Ethnobotanicals and IKS in Crop and Small Ruminants Production**
Results in the Figure 1 show the overall level of usage of ethnobotanicals and IKS in crop and small ruminants animal production in the study area. The results show that majority (70.5%) of the respondents indicated high usage of ethnobotanical and IKS while just (29.5% ) indicated low usage of ethnobotanical and IKS in the study area. This implies that majority of the farmers use ethnobotanical and IKS in treating diseases in animal. This might be as a result of the efficacy of the plants, no side effects, and cheap and easy accessibility to most of the farmers. This was in tandem with Worku, Asfaw, Firewhiwot, Tesfaye and Ashenif (2019) that there is an increased interest and use of herbal drugs due to public dissatisfaction with the cost of prescription drugs and interest in returning in to natural remedies. Also, it has been affirmed by Aziz et al. (2018) that the pattern of utilization of medicinal plants in a particular community is a part of its cultural traditional knowledge, passing from one generation to another generation representing a heritage.

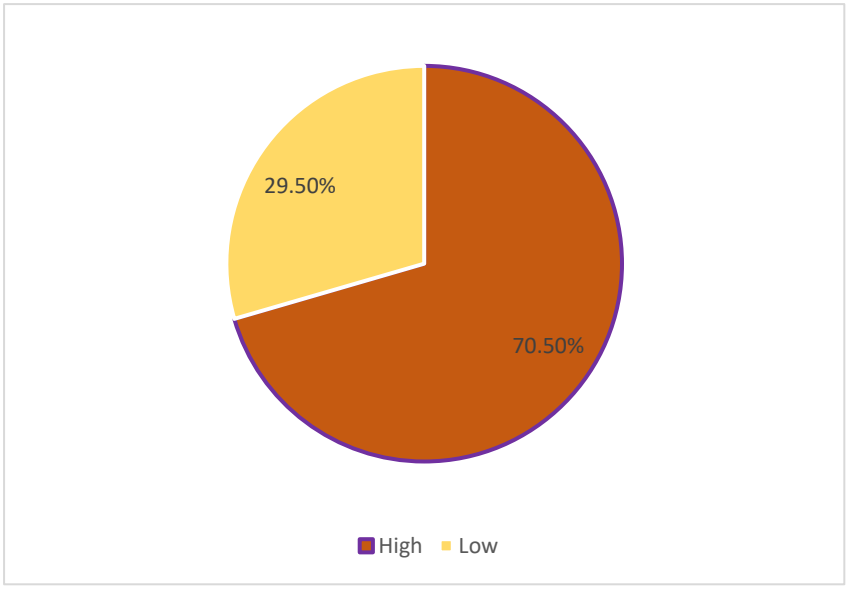


**Figure 1:** Level of usage of Ethnobotanicals and IKS in Crop and Small Ruminants Production

**Constraints Associated with the Use of Ethnobotanicals and IKS in Crop and Small Ruminants Production**

Results in the Table 7 show that no proper documentation of IKS (80.1%) was the major constraints associated with the IKS used in both crop and small ruminant's production was that there is. However, those that are documented are not completed and that the custodians of IKS are not willing to divulge the practices. The above statement can be supported by the assertion of Bamigboye (2015) that nobody will acknowledge a man that died with his knowledge. In addition, effects of environmental degradation (71.2%) were viewed as another major constraint to proper utilization of the IKS in both crop and small ruminant's production because most of the plants had started going into extinction. This result supports Sanhokwe et al. (2016) assertion that since knowledge about the application of ethno-veterinary medicine is transmitted orally, there is a risk that it will be lost due to technological and socioeconomic advancements.

**Table 7 Distribution of respondents according to constraints associated with utilization of ethno-botanicals and IKS**

| Constraints | Frequency | Percentage |
|---|---|---|
| No proper documentation of most IKS | 101 | 80.8 |
| Effects of environmental degradation | 89 | 71.2 |
| Fetish and mystery associated with some preparation | 63 | 50.4 |
| Much labour and time are required for preparation | 43 | 43.4 |

**Multiple responses**
**Source:** Field survey, 2021.

Data in Table 8 show that there exist a positive and significant relationship between the age of the respondents and their use of ethnobotanicals and IKPs. This implies that the older the age of the rural dwellers, the higher their use of IKPs.

**Table 8: Relationship between personal characteristics of respondents and use of ethno-botanicals and IKPs in crop and small ruminants' production.**

| Variable | Correlation coef. (r) | Coefficient of determination | % contribution | Decision |
|---|---|---|---|---|
| Age | 0.08 | 0.00064 | 0.64 | NS |
| Functional contact with extension agents | 0.329** | 0.108241 | 10.8241 | S |
| Number of small ruminant owned | 0.177 | 0.031329 | 3.1329 | NS |

**Source:** Field survey, 2021

**Conclusion and Recommendations**

The study concluded that with 70.5% level of usage of ethno botanicals and indigenous knowledge systems, it is evident that farmers are still using it. There is need for more research work on the use of identified ethno botanicals to enable farmers to effectively manage small ruminant for profit maximization and proper documentation of the IRS so as not to go into extinction. The government must start a campaign to use IKS as a reliable supplement to contemporary science-based technology, and rural development workers, botanists, and biochemists must work together to properly characterize the plants and identify the active ingredients in the majority of the identified plants.

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