



CONTRIBUTIONS OF INDIGENOUS KNOWLEDGE TO THE CONSERVATION OF FOREST RESOURCES IN BENUE STATE, NIGERIA.

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Received: December 13, 2021 Accepted: February 20, 2022

Abstract

A multi-stage sampling technique with four stages was adopted for this study. Three Local Government Areas (LGAs) were randomly selected from each of the agro-ecological zone in Benue State. Two wards from each LGAs and 30 respondents were selected to give a total of 540 respondents for this study. A total of 540 questionnaires were developed, validated and administered to the respondents in the study area with only 535 retrieved. Data generated was analyzed using simple percentages and Logistic regression analysis at $\alpha_{0.05}$. The result on sex indicated that, 430 (80.4%), males and 105 (19.6%), females. The result on age indicated that; 5 (0.9%), 1-15 years; 10 (1.9%), 16-35 years; 15 (2.8%), 36-45 years; 135 (25.2%), 46-60 years while 370 (69.2%) are above 61 years. The result on educational status shows that, 405 (75.7%), Adult education; 80 (15%), primary education; 35 (6.5%), secondary education and 15 (2.8%), tertiary education. The result on length of stay indicated that, 30 (5.6%), 1-15 years; 35 (6.5%), 16-30 years; 40 (7.5%), 31-60 years and 430 (80.4%), 61 years and above. The result on marital status showed that, 35 (6.5%), singles while 500 (93.5%) are married. The result on occupation shows that; 350 (65.4%), farmers; 105 (19.6%), Fishermen; 35 (6.5%), Hunters; 15 (2.8%), Artisans and 30 (5.6%), Civil servants (Table 1.1). The result on indigenous knowledge indicated that; 200 (37.4%), cultural taboos; 120 (22.4%), restriction of harvest to specific days, weeks, months or seasons; 110 (20.6%), adoption of shifting cultivation or bush fallows and 105 (19.6%), adopts licensing regimes (Table 1.2). The result on repercussions for violating indigenous knowledge indicated that; 100 (18.7%), madness; 78 (14.6%), long delivery time for pregnant women; 65 (12.1%), dumbness; 95 (17.8%), barrenness; 62 (11.6%), diarrhea; 75 (14%), continuous menstruation and 60 (11.2%), snake bite (Table 1.3). The result of logistic regression analysis indicated that, instant consequences (ICC), involvement of witches and witchcraft (IWW) and the observation of taboos by everybody (TOE) had the highest odds-ratio of 975.74, 348.86 and 60.08 respectively while age (0.002), occupation (0.00), educational status (0.52), sex (0.01), household size (0.00), agro-ecological zone (0.00) and monthly income (0.00) had odd-ratio lower than two (2) respectively (Table 1.4). In conclusion, most of the respondents are males, married, elderly with low education and stayed in the study area over a long period of time and are mostly farmers. They use taboos to regulate the exploitation and conservation of forest resources. Those that violate these taboos have the followings to contend with; madness, long delivery time for pregnant women, dumbness, barrenness, diarrhea, continuous menstruation and snake bite respectively. Nevertheless, instant consequences, involvement of witches and witchcrafts and the observation of taboos by everybody were found to influence or promote the use of indigenous knowledge in the conservation of forest resources in the study area. Based on the major findings from the study, the followings are recommended; It has been observed that, the custodians of indigenous knowledge tend to hide this knowledge for fear of patronage and loss of respect and power, In order to create fears in the minds of their subjects, they mystify the taboos and the consequences are evoked spiritually, There is the need to respect, preserve, maintain and promote the use of indigenous knowledge used in the conservation of forest resources in the study area, However, for this to happen, there is the need to document the indigenous knowledge used in the conservation of forest resources in the study area. There is also the need to adopt these taboos that are friendly in our forest policy in the study area.

Key words:

Contributions, Conservation, Forest resources, Indigenous knowledge

Introduction

Indigenous knowledge is the unique knowledge confined to a particular culture or society also referred to as local knowledge, people's knowledge or traditional science. This knowledge is generated and transmitted by communities over time, in an effort to cope with their own agro-ecological and socio-economic environments (Dagba *et al.*, 2013). Indigenous knowledge is passed from generation to generation, usually by word of mouth and cultural rituals and has been the basis for agriculture, food Preparation and conservation, healthcare and the wide range of other activities that sustain a society and its environment in many parts of the world for many centuries (Albano, 2001; Bisong and Essien, 2010).

Although, indigenous knowledge is considered archaic, it is the social capital of the poor as it serves as their main asset to invest in the struggle for survival, to produce food, shelter and to achieve control of their own lives. However, most of the indigenous knowledge disappear due to the intrusion of foreign technologies and development concepts that promise short-term gains or solutions to problems without being capable of sustaining them. The tragedy of the disappearance of this knowledge system is most obvious to those who have developed it and make a living through it. But the implication for others can be detrimental as well, when skills, technologies, artifacts, problem solving strategies and expertise are lost. This indigenous knowledge goes hand in hand with the people's culture (Check, 2011).

According to Appiah-opoku, (2007), Indigenous knowledge holds the ascription of supernatural powers to objects called gods and goddesses in Nigeria. There is the belief that the abode of the gods and goddesses are located in rock, streams, pond, trees and land or anywhere within the community. The gods vent their anger on whoever defiled such places; hence, the Indigenous knowledge holds all the precepts of the laws of the gods to a very high esteem which they expressed in form of taboos and beliefs (Adekunle and Ajakaye, 2003; Soury *et al.*, 2007; Dagba *et al.*, 2013). The taboos and beliefs have legal backing in the rules and institutions of the communities which are strong enough to make people obey (Appiah-opoku, 2007).

The role of indigenous knowledge in the protection of forest resources is reflected in a variety of practices including sacred groves and sacred landscapes. For instance, in Cross River State, there is hardly any community without a sacred groove, evil forest, sacred pond, evil stream, or forbidden forest where some parts of the environment are delineated for the worship of the gods (Adekunle and Ajakaye, 2003). Among the people of Benue state, there is hardly any community without traditional beliefs (Dagba *et al.* 2013).

The gods choose their followers through the rites of initiation with a core messenger who is the mouth piece of the gods living among human beings. The gods or goddess communicate its will to the people through the juju priest or chief priest. The belief system is that, the gods protect the community members from harm, famine, bareness, impotence, drought, epidemics and war among others. The gods avenge their anger on whoever omits or commits any flaw for which their presence forbids; hence, the Indigenous knowledge holds to a very high esteem all the precepts of the laws of the gods (Dagba *et al.*, 2013, Wang *et al.*, 2019; Zaku *et al.*, 2019). These beliefs and strategies are passed on to those who become initiated into adulthood in the community during the rites of initiation. Most often, it is the men that are always initiated into these community cults or sects which are often enshrined in religious or cultural beliefs and superstitions which are enforced by taboos (Albano, 2001; Adekunle and Ajakaye, 2003; Appiah-opoku, 2007; Soury *et al.*, 2007; Rao and Ramana, 2007; Jimoh *et al.*, 2012; Osemeobo, 2013).

Benue State has a very strong culture and hold many believes despite the westernization of things, the people of Benue State have converted to Christianity but their traditional religion based on the manipulation of forces (*Akombo*) entrusted to humans by a creator god, remains strong and is enforced in the protection of their people as well as

valuable resources such as farms and forests. The *Akombo* is manifested in certain symbols or emblems and in disease that they create to help guide against violators of certain taboos. An organization of elders who have the ability to manipulate these forces meets at night to repair those manifestations of *Akombo* (e.g, epidemics) that affects the group (Dagba *et al.*, 2013).

In emphasizing the value of indigenous knowledge in forest resources conservation, Dagba *et al.* (2013) stressed that, though indigenous knowledge was previously regarded as inferior or incompetent, they are now receiving global recognition as an important complement to existing conservation strategies. He further submitted that, this recognition, however, is still inadequate within official conservation policies. Indigenes of Benue State have very strong ties with their forest. They have extensive knowledge of their forest resources and have developed ancient habit practices, rules or taboos which they use directly or indirectly to regulate forest resources exploitation and this has helped to ensure protection of forest resources by both indigenes and strangers (Zaku *et al.*, 2019).

Before the advent of forest policy, the exploitation of forest resources were regulated by taboos and the people respected and obeyed these taboos as violators were meted with immediate or instant consequences. Despite the fact that the idea of forest conservation is presently being kicked against in the rural communities of Benue State, these same communities have been able to sustain the conservation of forest resources successfully in the past (Zaku *et al.*, 2019).

The Convention on Biodiversity which Nigeria is also a member underscores the need for states and countries to respect, preserve, maintain and promote the use of indigenous knowledge used in the conservation of forest resources. However, for this to happen, there is the need to document this indigenous knowledge in the study area. Therefore, "Contributions of indigenous knowledge to the conservation of forest resources in Benue State" was investigated.

Materials and Methods

This study was carried out in Benue State, Nigeria (latitude 6° 21' - 8° 10' N and longitude 7° 44' E - 9° 55' E). Benue State has a total land area of 30,955km². The State is made up of 23 Local Government Areas and three main ethnic groups namely; Tiv, Idoma and Igede. The Tivs, Idomas and Igedes are predominantly farmers. Other ethnic groups are Etulo, the Jukun, Hausa, Yoruba and Igbo (Fig.1). Benue State has a population of-----

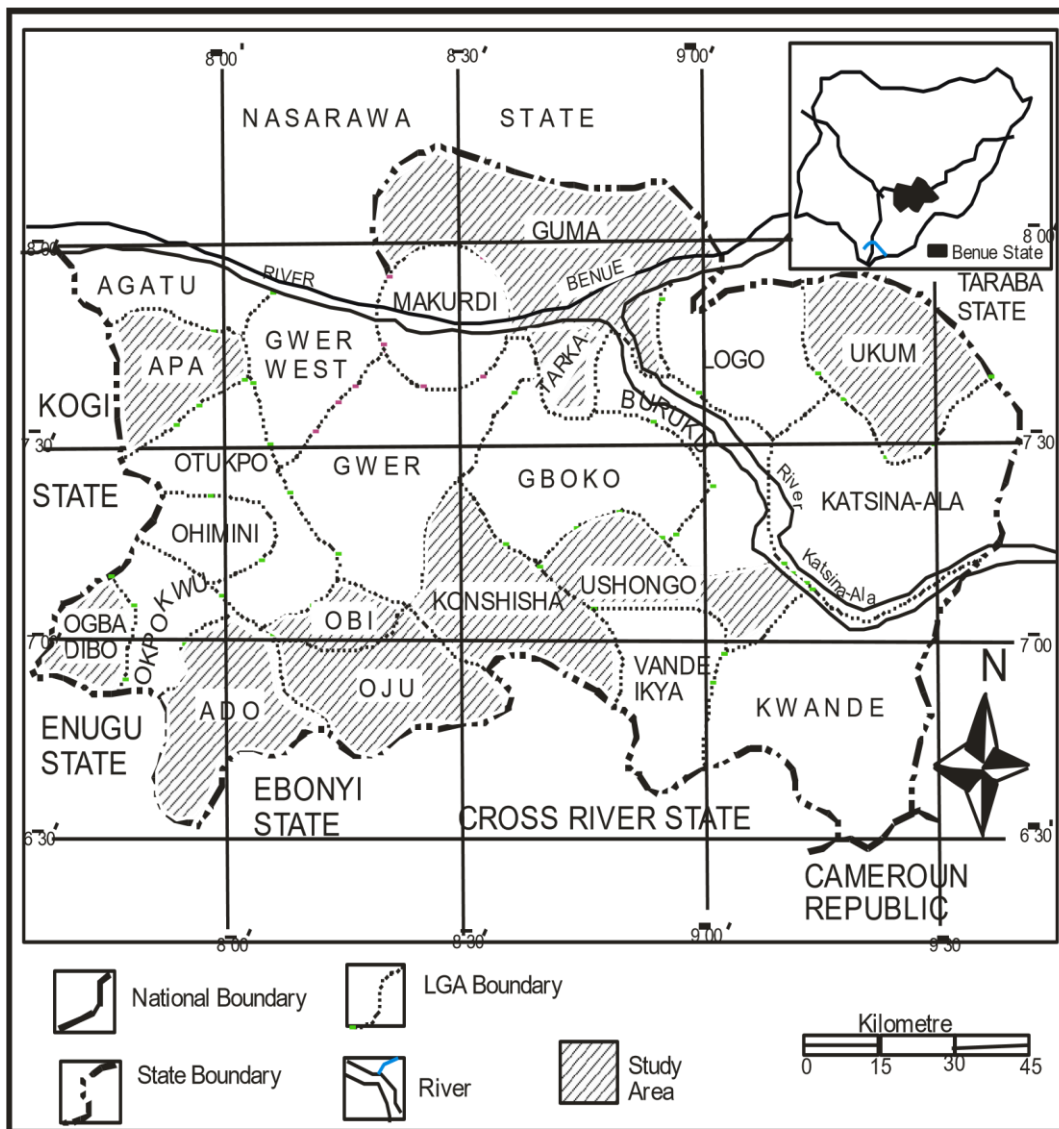


Figure 1: Map of Benue State showing study areas.

Source: BSD, (2012)

Fig. 1: Map of Benue State showing the study areas

Sampling procedure/Sample Size

A multi-stage sampling technique comprising of four stages was used to generate data for the study. The first stage involved the division of Benue State into three Agro-ecological zones as follows; Zone “A” (Katsina Ala, Kwande, Konshisha, Ushongo, Ukum, Vandeikya and Logo)

Zone “B” (Gboko, Makurdi, Guma, Gwer-West, Gwer-East, Tarkaa and Buruku)

Zone “C” (Otukpo, Ohimini, Ogbadibo, Obi, Oju, Agatu, Apa, Okpokwu, Ado)

The second stage involved a random selection of three local government areas from each of the three Agro-ecological zones as follows; Zone “A” (Ukum, Kwande and Vandeikya); Zone “B” (Gboko, Makurdi

and Buruku) Zone “C” (Otukpo, Oju and Apa). This brings the total to 9 Local Government Areas for the study. The third stage involved a random selection of two wards from each of the nine Local Government Areas, bringing the total to 18 wards. The fourth stage involved a random selection of 30 respondents thereby bringing the total to 540 respondents for the study. A total of 540 semi-structured questionnaires with open and closed ended questions was developed, validated and administered to the respondents to illicit their responses. The validation was done outside the study samples before they were finally administered in the study area (Adesoye, 2004). Data generated was analyzed using simple percentages and Logistic regression analysis at $\alpha_{0.05}$.

In this study, the binary logistic regression analysis was used to investigate the factors that influence the use of indigenous knowledge in Benue State. The factors (Independent variables) investigated were; Instant Consequence (ICC), Age (AGE), Occupation (OCCU), Educational Status (EDS), Sex (SEX), Household Size (HHS), Agro-Ecological Zone (AEZ), Involvement of wizards and witches (IWW), Taboos observed by everybody (TOE) and Monthly Income (MI).

The mathematical model is as follows;

Logit

$$\left(\frac{p}{1-p} \right) = Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n$$

Where;

$\beta_0, \beta_1, \beta_2, \dots, \beta_n$ =Regression coefficient or model parameters

The factors that can influence the use of indigenous knowledge in Benue State investigated were;

- X1 = Instant Consequence (ICC), X2 = Age (AGE), X3 = Occupation (OCCU)
- X4 = Educational Status (EDS), X5 = Sex (SEX), X6 = Household Size (HHS),
- X7 = Agro-Ecological Zone (AEZ) , X8 = Involvement of wizards and witches (IWW)
- X9 = Taboos observed by everybody (TOE), X10 = Monthly Income (MI)

Data generated was analyzed using simple percentages and logistic regression

Y = Influence on the use of indigenous knowledge (Binary variable)

X1-X10= Factors investigated (Independent variables)

Logistic Regression Equation-----2

$IUIK=ICC+AGE+OCC+EDS+SEX+HHS+AEZ+IWW+TOE+MI$

Where,

IUIK= Influence on the use of Indigenous Knowledge

Result and Discussion

1.1: Demographic characteristics of the respondents

The result on Demographic characteristics on sex of respondents indicated that, 430 (80.4%) are males while 105 (19.6%) are females. The result on age indicated that; five respondents (0.9%) are within the age bracket 1-15years; 10(1.9%) are between 16-35 years; 15(2.8%) are between 36-45years; 135(25.2%) are between 46-60years while 370(69.2%) are above 61years of age respectively. The result on educational status shows that, 405(75.7%), Adult education; 80 (15%), primary education; 35(6.5%), secondary education and 15(2.8%), tertiary education respectively. The result on length of stay in Benue State indicated that, 30(5.6%), 1-15years; 35(6.5%), 16-30years; 40(7.5%), 31-60years and 430(80.4%) had stayed more than 61years.

The result on marital status of the respondents showed that, 35(6.5%) are singles while 500(93.5%) are married. The result on occupation shows that; 350(65.4%) are farmers; 105(19.6%), Fishermen; 35(6.5%), Hunters; 15(2.8%), Artisans and 30(5.6%) are Civil servants respectively (Table 1.1).

Result and Discussion

Socio-economic characteristics of the respondents in the study area

The result on Socio-economic characteristics of the respondents on age indicated that, 50(3.8%), 16-30 years; 200(15.4%), 31-45years; 550(42.3%), 46-60years while 500(38.5%) are above 61years. Also, the result on sex of the respondents indicated that, 1,100 (84.6%) are males while 200(15.4%) are females. The result on marital status of the respondents showed that, 300(23.1%) are singles while 1,000(76.9%) are married. Similarly, the result on educational status shows that, 50(3.8%), Quaranic education; 650(50%), Adult education; 450(34.6%), primary education; 100(7.7%), secondary education; 50(3.8%), tertiary education respectively. The result on household size of the respondents indicated that, 50(3.8%) had no children; 200(15.4%), 1-3 household size; 350(27%), 4-6 household size while 700(53.8%) had household size more than seven respectively (Table 1.1).

Table 1.1: Demographic characteristics of the respondents

Variables	No of Respondents	Percentages
Sex		
Male	430	80.4
Female	105	19.6
Total	535	100
Age		
1-15years	5	0.9
16-35years	10	1.9
36-45years	15	2.8
46-60years	135	25.2
Above 61years	370	69.2
Total	535	100
Educational Status:		
Adult Education	405	75.7
Quaranic Education	0	0
Primary Education	80	15.0
Secondary Education	35	6.5
Tertiary Education	15	2.8
Total	535	100
Length of Stay in the study area:		
1-15 years	30	5.6
16-30 years	35	6.5
31-60 years	40	7.5
Above 61years	430	80.4
Total	535	100
Marital Status:		
Single	35	6.5
Married	500	93.5
Total	535	100
Occupation:		
Farming	350	65.4
Fishing	105	19.6
Hunting	35	6.5
Artisan	15	2.8
Civil Service	30	5.6
Total	535	100

Source: Field Survey, (2022).

The high number recorded of sex on males implied that most of the respondents are males. This may due to the fact that, the males are the custodians of indigenous knowledge in the study area. Similarly, the same reason could be attributed to high number recorded of age for elderly people. The high number recorded of educational status on Adult education implied that, most of the respondents had low education. This is because during the colonial era only but few people were allowed to go to school by their parents. This explains why the taboos were not written down anywhere. Also, the high number recorded of length of stay of more than 60 years implied that, most of the respondents are elderly and have knowledge of the indigenous knowledge that were used in the

conservation of forest resources in the study area. Similarly, the high number recorded of marital status on “married” implied that, majority of the respondents are married. This means that, they are responsible people. The result of occupation of respondents indicated that, farming, fishing, hunting, civil servant and artisans were the means of livelihood of the respondents. This means that, the respondents all had their means of livelihoods and are very responsible people in the society. The above findings corroborate Zaku *et al.* (2019) and Dagba *et al.* (2013) respectively.

Indigenous knowledge used in the conservation of forest resources in the study area

The result on indigenous knowledge used in the conservation of forest resources indicated that;

200(37.4%), cultural taboos; 120(22.4%), restriction of harvest to specific days, weeks, months or seasons; 110(20.6%), adoption of shifting cultivation or bush fallows and 105(19.6%), adopts licensing regimes respectively (Table 1.2).

Table 1.2: Indigenous Knowledge used in the conservation of Forest Resources by Respondents.

Variables	No of Respondents	Percentage
Cultural taboos	200	37.4
Restriction of harvest to specific days, weeks, months or years	120	22.4
Adoption of shifting cultivation or bush fallows	110	20.6
Adoption of licensing regimes	105	19.6
Total	535	100

Source: Field Survey, (2022).

The high number recorded of indigenous knowledge on cultural taboos to conserve forest resources implied that, they are the most widely used of the indigenous knowledge in the conservation of forest resources in the study area before the advent of forest policy. While people see it as archaic and inferior, it has been and it is still the best method used in the conservation of forest resources. This corroborate Adekunle and Ajakaye, (2003); Albano, (2001); Appiah-opoku, (2007) and Bisong and Essien, (2010) respectively.

Repercussions for violating indigenous knowledge used in the conservation of forest resources in the study area.

The result on repercussions for violating indigenous knowledge used in the conservation of forest resources in the study area indicated that; 100(18.7%), madness; 78(14.6%), long delivery time for pregnant women; 65(12.1%), dumbness; 95(17.8%), barrenness; 62(11.6%), diarrhea; 75(14%), continuous menstruation and 60(11.2%), snake bite respectively (Table 1.3).

Table 1.3: Repercussions for violating Indigenous Knowledge used in the conservation of Forest Resources in the study area

Variables	No of respondents	Percentage
Madness	100	18.7
Long delivery time for pregnant women	78	14.6
Dumbness	65	12.1
Barrenness	95	17.8
Diarrhea	62	11.6
Continuous menstruation	75	14
Snake bite	60	11.2
Total	535	100

Source: Field survey, (2022).

The above result implied that, violators had repercussions such as madness, long delivery time for pregnant women, dumbness, barrenness, diarrhea, continuous menstruation and snake bite respectively to contend with. They mystify these repercussions to create fears in the minds of the people. This is because the repercussions are evoked spiritually through Akombo. The findings agreed with the submissions of Soury *et al.* (2007); Jimoh *et al.* (2012); Osemeobo (2013) and Dagba *et al.* (2013) respectively.

Factors that influence use of Indigenous Knowledge in the conservation of forest resources in the study area.

The result on logistic regression analysis of factors that influence use of Indigenous Knowledge in the conservation of forest resources in Benue State indicated that, instant consequences (ICC), involvement of witches and witchcraft (IWW) and the observation of taboos by everybody (TOE) had the highest odds-ratio of 975.74, 348.86 and 60.08 respectively while age (0.002), occupation (0.00), educational status (0.52), sex(0.01), household size (0.00), agro-ecological zone (0.00) and monthly income (0.00) had odd-ratio lower than two (2) Respectively(Table 1.4).

The decision rule is that, all factors that have odds-ratio with negative values or values lower than two does not influence or promote the use of indigenous knowledge in the conservation of forest resources. Only variables with odds-ratio two (2) or greater than two (2) influences or promote the use of indigenous knowledge in the conservation of forest resources in the study area.

$$DIK = 2.77 + 6.88ICC - 3.85AGE - 36.42OCCU - 0.63EDS - 5.03SEX - 35.37HHS - 16.68AEZ + 5.85IWW + 4.09TOE - 13.55MI \dots \dots \dots 1$$

n=535, Final loss =32.87
 Chi- square (df, 10) = 419.48, P = 0.0000
 Odds- ratio (unit change): constant (1.10); ICC
 (975.74); AGE (0.002); OCCU (0.00); EDS (0.52);

SEX (0.01); HHS (0.00); AEZ(0.00); IWW(348.86);
 TOE (60.08); MI (0.00).

Table 1.4: Logistic regression analysis of factors that influence or promote the use of indigenous knowledge in the conservation of forest resources in the study area

Dependent variables: Dependence on Indigenous Knowledge for conservation of forest resources
 (Presence = 1: Absence = 0)

S/No	Independent variables	coefficient	Odds-ratio
1	Whether ICC influence the use of IK	6.88	975.74*
2	Whether AGE influence the use of IK	-3.85	0.002ns
3	Whether OCCU influence the use of IK	-36.42	0.00ns
4	Whether EDS influence the use of IK	-0.63	0.52ns
5	Whether SEX influence the use of IK	-5.03	0.01ns
6	Whether HHS influence the use of IK	-35.37	0.00ns
7	Whether AEZ influence the use of IK	-16.68	0.00ns
8	Whether IWW influence the use of IK	5.85	348.86*
9	Whether TOE influence the use of IK	4.09	60.08*
10	Whether MI influence the use of IK	-13.55	0.00ns

Model $X^2(df=10) = 191.17^*$ P<0.05, ns = Not significant, * = Significant

The factors that influence or promote the use of indigenous knowledge in the conservation of forest resources in Benue State showed that, instant consequences, involvement of witches and witchcraft and the observation of taboos by everybody are statistically significant. This is because the estimated coefficient for the mentioned variables were not zero, negative values or less than two (2) but were above two (2). This implied that, the regression parameters in the model were statistically significant. The higher the values of the odds-ratio of the mentioned variables, the more the likelihood of such variables to influence or promote the use of indigenous knowledge in the conservation of forest resources in the study area. The possession of high odds-ratio above two (2) implies that, such variables influenced or promote the use of indigenous knowledge in the conservation of forest resources. The findings indicated that, instant consequences, involvement of witches and witchcraft and the observation of taboos by everybody were found to influence or promote the use of indigenous knowledge in the conservation of forest resources in the study area. This is because, people tend to obey rules that have immediate consequences than those whose consequences are not immediate or instantly. Also, the fact that, nobody is above the rule is another reason why everybody will want to obey the rule. This is typically different from what we have in Nigeria, where some people are above the law. Similarly, since the consequences are evoked spiritually by witches and witchcraft or Akombo, people are scared and are

ever ready to obey the rules on the conservation of forest resources in the study area. This explains why before the advent of forest policy, the exploitation of forest resources were regulated by taboos and the people respected and obeyed these taboos as violators were meted with immediate or instant consequences. It should be noted here that, despite the fact that, the idea of forest conservation is presently being kicked against in the rural communities of Benue State, these same communities have been able to sustain the conservation of forest resources successfully in the past by the use of taboos.

Similarly, age, occupation, educational status, sex, household size, agro-ecological zone and monthly income do not influence or promote the use of indigenous knowledge in the conservation of forest resources in the study area. This is due to the fact that, the taboos are observed by everybody including the custodians and its repercussions can be meted on anybody that violates it, irrespective of age, occupation, educational status, sex, household size, agro-ecological zone and monthly income of such a person. This findings corroborates Adekunle and Ajakaye, (2003); Soury *et al.* (2007) and Appiah-opoku, (2007) respectively. The findings also corroborates Decks (1996); Bland and Altman (2000) and Zaku *et al.* (2019), that, the logistic model provided information on the influence or consequence of one variable on another (i.e factors that influence or promote the use of indigenous knowledge in the conservation of forest resources in the study area).

Conclusion

The followings are the major findings of the study; Most of the respondents are males, married, elderly with low education and stayed in the study area over a long period of time and are mostly farmers. They use taboos to regulate the exploitation and conservation of forest resources. Those that violate these taboos have the followings to contend with; madness, long delivery time for pregnant women, dumbness, barrenness, diarrhea, continuous menstruation and snake bite respectively. Nevertheless, instant consequences, involvement of witches and witchcrafts and the observation of taboos by everybody were found to influence or promote the use of indigenous knowledge in the conservation of forest resources in the study area.

Recommendation;

Based on the major findings from the study, the followings are recommended;

1. People should stop seeing taboos as archaic or inferior but should see them as an important policy for conservation of forest resources in the study area.
2. It has been observed that, the custodians of indigenous knowledge tend to hide this knowledge for fear of patronage and loss of respect and power. This must be avoided. Instead, they should teach the younger ones who will in turn teach their children so that, this important body of knowledge will not be lost forever.
3. In order to create fears in the minds of their subjects, they mystify the taboos and the consequences are evoked spiritually. This has been found to be successful and should be encouraged.
4. There is the need to respect, preserve, maintain and promote the use of indigenous knowledge used in the conservation of forest resources in the study area. However, for this to happen, there is the need to document the indigenous knowledge used in the conservation of forest resources in the study area.
5. Taboos that have been used successfully to conserve forest resources should be included in our forest policy of today.

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