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FACTORS INFLUENCING THE UTILISATION OF NON-TIMBER FOREST PRODUCTS AMONG USERS IN KWARA STATE, NIGERIA

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ABSTRACT

The study examined the factors influencing the utilization of Non-Timber Forest Products among users in Kwara State, Nigeria. Data were gathered through the administration of a questionnaire to 251 randomly selected users from 9 purposively selected communities in the state. The data were analyzed using descriptive statistics and binomial logit regression. The result of the analysis showed that fish was ranked 1st among the list of identified NTFPs while the level of utilization indicated a high mean score for fruits/ vegetables (2.8), fish (2.7), charcoal (2.7), locust bean (2.5), shea oil (2.4), fuelwood (2.4), kola nut (2.1) and honey (2.0). Furthermore, the result of the binomial logit regression revealed that age, income, household size, utilization experience, knowledge of use, and NTFP cost significantly influenced the utilization of NTFPs in the State. The study recommends sustainable cultivation, collection, processing, and trading of NTFPs among users to make the products affordable to users in perpetuity.

Keywords: *Non-Timber Forest Products; utilization; users.*

INTRODUCTION

Non-timber forest products (NTFPs) are broadly defined as any forest-derived tradable products other than commercial timber that are known to contribute significantly to the economies of the communities around them (James *et al*., 2018). NTFPs do not only contribute directly to nutrition and health, but they also contribute to increasing household purchasing power. A considerable number of people throughout Nigeria make extensive use of biological products from the wild (Ayeni *et al*., 2018). Non-Timber Forest Products (NTFPs) enable the sustainable use of the forest resources; using resources in a way that they will be available for use by the future generation. NTFPs are collected by rural households for diverse products and functions. It is well established that NTFPs fulfill multiple functions in supporting human well-being. Thus, Adeniran and Adebayo (2022), ascertain that NTFPs play an important role in meeting the needs of rural communities, especially in the areas of food, medicine and poverty reduction, sustainable management of forest resources, and livelihoods improvement. Mahonya *et al.* (2019), opined that the income contributions of NTFPs are often highest amongst the poorest households and communities, large households, and those in more remote settings. There is also growing evidence that local and wider-scale commercialization of NTFPs is increasing in many regions, providing cash income to numerous households (Akinbile *et al*., 2018).

However, the increasing population of both rural and urban Nigeria has exerted increasing pressure on the demand for both timber and non-timber forest products. The need for food from NTFPs, medicine, and organic remedies for sustainable livelihood has hitherto necessitated the continuous exploitation of NTFPs without regard to the expansion of its market potentials at a rural level that aimed at sustainable utilization, with a view to improving revenue that will promote high standard of living among rural dwellers. Hitherto, a high degree of NTFP value addition via processing that will ascertain sustainable utilization in perpetuity has not been achieved because the agelong traditional utilization abounds in most of the communities that depend on NTFPs for livelihood. This has created a wide gap in the demand for NTFPs by users and its corresponding supply by producers/marketers. It is because of this that the study sought to examine the factors that influence the utilization of Non-Timber Forest Products on the livelihood of users in Kwara State, Nigeria. The specific objectives of the study were to:

i) identify and describe various type(s) and forms of utilization of non-timber forest products; and,
ii) determine the factors influencing the utilization of NTFPs

It was hypothesized that there was no significant relationship between the socio-economic and psychological factors and the level of utilization of NTFPs.

METHODOLOGY

Study area

The research was conducted in Kwara State. The state is comprised of sixteen Local Government Areas which are divided into four agricultural zones namely: zone A (Kaiama), zone B (Patigi), zone C (Shao), and zone D (Igbaja). Based on an annual growth rate of 2.8% (Adewumi, 2017), the estimated population of the State by 2022 was 3,366,946 million persons. Moreover, the land is buoyant in agricultural and forest resources with rice and sugar cane as its significant cash crops;

yams, maize, sorghum, millet, and beans as staple crops: and vitillaria and parkia as some of the forest trees from where shea butter and locust bean are being produced.

Sampling Procedure and Sample Size: A multi-stage sampling technique was used in selecting users.

Stage 1: Purposive selection of three (3) LGAs in the State. The selection of these LGAs was based on the availability, harvesting, and utilization of NTFPs. These included: Kaiama, Baruten, and Ekiti L.G.As.

Stage 2: Three communities were purposively selected from each LGA based on the prominence of NTFP utilization. The communities included Kugiji, Gwaria, and Kanikoko from Kaiama LG; Okuta, Ilesha, and Gwanara from Baruten; and Osi, Epe Opin and Isare Opin from Ekiti.

Stage 3: Finally, 25% of NTFPs users in each community were selected i.e. Kaiama (Kugiji=27; Gwaria=32; Kanikoko=25), Baruten (Okuta=30; Ilesha=29; Gwanara=31), Ekiti (Osi= 29; Epe Opin= 19; Isare Opin= 29) = 251.

Analytical techniques: Both descriptive and inferential statistics were used in this study.

Binomial Logit model

This was used to analyze the choices in relation to some predictor or explanatory variables (socio-economic and demographic characters) which can be discrete, continuous, or categorical. The model involves cases where the observed outcome can have only two possible values (Dimelu *et al*., 2015). The outcome is coded as '0' and "1" where the target group (referred to as a case) is coded '1' and the reference group (referred to as a non-case) is coded '0'. This statistic was used to estimate the relationship between the level of usage of NTFPs (Y_U) and the socio-economic, institutional, and cultural characteristics (X) of the users of NTFPs. The conceptual model can be specified as:

$P_i = E(Y_U = 1/X_i) = e\ (\beta_0 + \beta_1X_1 + \beta_2X_2 \ldots\ldots\ldots\ldots\ldots\ldots \beta_iX_i$

Where: P_i = the probability that dependent variable Y_u = (1= high users; 0= low users); Y_U = level of utilization of NTFPs (1= high; 0= low); β_0 = the intercept which is constant; $\beta_{1\ldots}\beta_i$ = coefficient of determinants of utilization of NTFPs; X_i = set of independent variables which was specified as:

X_1 = level of education (years spent in school); X_2= age of users (in years); X_3= sex of users (male= 1; female= 0); X_4= income of users (₦); X_5 = marital status (1= married; 0 = others); X_6 = size of household (number of persons living and feeding together); X_7 = cooperative membership (member =1; non-member =0); X_8= experience in use of NTFPs (years); X_9 = extension contact (number of extensions visit in the last one year); X_{10} = credit accessibility (amount accessed (₦); X_{11} = social customs (1 = yes; 0 = otherwise); X_{12} = language (number of languages spoken by users); X_{13} = religion (1 = Traditional; 2 = Islam; 3 = Christianity); X_{14} = knowledge of NTFPs by user (1= high; 0= low); X_{15} = attitude of user (1= favourable; 0 = otherwise);
X_{16} = perception of user on NTFPs (1= positive 0= otherwise)

Definition and measurement of variables

Utilization according to the Cambridge Dictionary "is the amount of something available, produced, etc. compared with the total amount that exists or that could be produced." It was further

stressed that "it is the process of using something effectively". In the context of this study, it is the process of using NTFPs effectively. The level of utilization as a dependent variable was measured by dummy variables (1 and 0). If the utilization level is high, it is coded '1' and 0 = low.

Educational level: This is the acquisition of knowledge by an individual through formal means. Education is not only an important determinant of knowledge of innovation but also an instrument for the successful implementation of innovation for profitability. The a priori expectation is that when a user spends more years in formal schooling, he becomes more proficient in reading and writing and thus, able to utilize NTFPs efficiently. Education was captured as follows: (i) Primary = 6years; (ii) Secondary =12years; (iii) Tertiary =15years and above; 0 = none.

Age: This is the period that an individual has lived from birth to the present. The a priori expectation is that aged individuals are likely to use more NTFPs than younger ones. It is also expected that the utilization index would be positively correlated with the age of the user. Age was measured as the number of years of each user at the time of data collection.

Sex: This is the biological characteristic of an individual. It is expected that the female utilizes more NTFPs (charcoal, fuelwood, and locust bean) than the male. It was captured using a dummy variable as 1 = male, 0 = female.

Income: This is the money earned by a user from his livelihood activities. The average value of what a farmer earned in a year was measured in naira to know the level of income. Income level is expected to be positively correlated with NTFP utilization.

Marital status: This is the fact of whether an NTFP user is married or not. It is expected that married users will have more farm labour and will readily have access to NTFPs collection for affordable and efficient utilization. This was captured as 1 = married, 0 = otherwise.

Family size: This is the number of people eating from the same pot and living with the user. A user was asked to indicate the number of individuals in his household. It is hoped that users with large families will conveniently utilize more NTFPs.

NTFPs utilization experience: This is the number of years spent by an individual in the utilization of NTFPs. It is expected that the years of experience will increase the level of utilization.

Membership of cooperative societies: This is the association or group that a user identifies himself with in order to benefit from credit facilities, marketing, and inputs provided at a subsidized rate. It was measured using yes = members, and no = non-members.

Extension contact: This refers to the number of contacts the user has with extension officials. The postulation is that a user who constantly meets with extension personnel is more enlightened and therefore has greater awareness about the potential gains of utilizing NTFPs. This was measured by the number of visits of an extension worker to the farmer.

Access to Credit facility: This is the additional source of funds to the user through financial institutions and other sources. It is expected that a user with access to funds will readily and effectively utilize NTFPs aimed at improving his livelihood. Availability of credit was captured using a dummy variable as yes = 1, no = 0.

Cultural factors: These are aspects of culture in a society that influence the utilization of NTFPs. They include symbols of society such as the use of *Neubodia laevis* leafs for chieftaincy installation, religious beliefs that prohibit the use of some NTFPs e.g. monkey consumption,

societal customs like the use of kola nut for weddings, religious ceremonies and cultural identity. These were measured using dummy variables as 1 = yes, 0 = otherwise

Knowledge: This is the skill that a user has through training received or information on the use of NTFPs. This determines effective utilization. This was captured as high (coded 3), moderate (2), and low (1).

Attitude: These are individual feelings, inclinations, and indeed those of other household members with regards to NTFP use and it was measured as Favourable (3), Indifference (2), and Unfavourable (1).

Perception: Perception has been defined to be a person's feeling towards a system or an object (Babasanya, 2022). This involves the integration of sensory information with pre-existing knowledge, experiences, and expectations. It was measured as Positive (3), Neutral (2) and Negative (1).

RESULTS AND DISCUSSION

Major Non-Timber Forest Products (NTFPs) in the Study Area

The information on major NTFPs in the study area was extracted from the NTFPs utilized by the users for consumption, medicaments, and/or trade. The study revealed that fish ranked 1st in the study area. This was closely followed by locust bean (2nd), charcoal (3rd), fuelwood (4th), fruits and vegetables (5th), kola nuts (6th), honey (7th), shea oil (8th) and bitter cola (9th). Furthermore, the use of moringa (10th), chewing stick (11th), bush meat (12th), snail (13th), and mushroom (14th) was not common, while the use of tamarind (15th) ranked last in the list. This could be because fishing is a major livelihood activity of communities around the Kainji Lake and major rivers in the study areas. Fish are classified as NTFPs in this study based on the definition of Opute *et al*. (2020), that NTFPs are goods of biological resources, products, and services other than timber which are collected from the forest ecosystem for survival and trade. Also, wild grooves of parkia that produce locust beans predominate in the area while charcoal and fuel wood constitute the main cooking energy source for the users. However, honey, shea oil, and bushmeat were found to be more lucrative among the other products in terms of revenue, implying that the households in the study area engage more in the collection and trade of these products to meet their various needs.

This finding contradicts that of Olawuyi *et al*. (2021), where wrapping leaves constituted 23.2% of the identified NTFPs as against fish (3.2%) in the Oluwa Forest reserve, Ondo State. Similar findings by Sunday and Holy (2019), showed that oils (4.6), fruits/vegetables (4.3), and spices (4.3) were the most frequently used NTFPs in Ikwerre, Rivers State, while Opaluwa *et al*. (2011), identified herbs (90.97%), fuelwood (83.87%) and locust beans (72.90%) as the major NTFPs collected and utilized in North Central, Nigeria. However, this study considers the available resources hence only 15 products among others were selected. The distribution of the selected NTFPs is shown in Table 1.

Table 1: Distribution of Users by the major NTFPs Utilised

NTFPs utilized	Form of Use	Frequency	Percentage	Rank
Fish	Food	251	17.8	1st
Locust bean	Spices	196	13.8	2nd
Charcoal	Cooking, air purification,	152	10.8	3rd
Fuelwood	Cooking energy	123	8.7	4th
Fruits/vegetables	Food	109	7.7	5th
Kola nuts	Stimulants/ cultural practice	95	6.7	6th
Honey	Food and medicine	92	6.5	7th
Shea oil	Food and medicine	75	5.3	8th
Bitter kola	Stimulants, medicine	67	4.7	9th
Moringa	Food and medicine	51	3.6	10th
Chewing sticks	Oral hygiene	49	3.5	11th
Bush meat	Food	47	3.3	12th
Snail	Food	39	2.8	13th
Mushroom	Food	34	2.4	14th
Tamarind	Medicine	33	2.3	15th
Total		1413	100	

* Total frequency > 251 = Multiple responses

Level of Utilisation of NTFPs

The level of NTFPs utilization in Table 2 indicated a high mean score (≥=2.0) for fruits and vegetables (2.8), followed by fish (2.7), charcoal (2.7), locust bean (2.5), shea oil (2.4), fuel wood (2.4), kola nut (2.1) and honey (2.0), implying that their level of utilization in the area is high since they are frequently used to meet the varying need. This is in line with the submission by Sunday and Holly (2019), who posited that fruits/ vegetables, oil seeds, spices/condiments, nuts/seeds, medicinal plants, and wild animals were frequently utilized NTFPs among Ikwerre farmers. The Table further showed a low mean score (<2.0) for chewing sticks (1.9) and bushmeat (1.8) because of the availability of close substitutes and the government policy of the Kainji Lake National Park that prohibits hunting of wildlife in the areas occupied by the park. These are closely followed by bitter kola (1.7), snail (1.5), tamarind (1.5), mushroom (1.4), and moringa (1.3) in descending order of utilization. This contradicts the submission by Ganiyu *et al*. (2023), that bushmeat ranked 1st in the list of NTFPs used in the Kajuru Local Government Area of Kaduna State.

Table 2: Mean Response of Users on their Levels of Utilisation of NTFPs

NTFPs	Weighted score			Total	Mean	Decision
	3	2	1	N=251	X	
Bushmeat	47	95	109	440	1.8	L
Shea oil	119	120	12	609	2.4	H
Honey	37	179	35	504	2.0	H
Fruits and vegetables	203	41	7	698	2.8	H
Locust bean	147	94	10	639	2.5	H
Moringa	-	87	164	338	1.3	L
Fish	198	31	22	678	2.7	H
Mushroom	-	89	162	340	1.4	L
Snail	15	91	145	372	1.5	L
Charcoal	198	36	17	683	2.7	H
Fuelwood	147	64	40	609	2.4	H
Chewing stick	45	136	70	477	1.9	L
Kola nut	79	127	45	536	2.1	H
Bitter kola	34	118	99	437	1.7	L
Tamarindus	32	70	149	385	1.5	L
Aggregate mean score					2.0	H

≥2.0 = High (H); <2.0 = Low (L)

Factors Influencing the Level of Utilisation of NTFPs

Binomial Logit regression analysis showed that age (0.279), income ($p = 0.026$, $P \leq 0.05$), household size (0.003), utilization experience (0.076), knowledge of utilization (0.04), and NTFPs cost (0.000) significantly influenced the level of utilization of NTFPs at 10%, 5% and 1% level of significance. The implication of this is that a unit increase in these significant variables will lead to an increase in NTFP utilization by the users. This concurred with Dash *et al.* (2018) that age had a positive and significant relationship with NTFP collection and household livelihood activities. Also, Dash *et al.* (2016) opined that income significantly determines participation in NTFPs' livelihood activities. Ganiyu *et al.* (2023) corroborated this by submitting that knowledge of the use of NTFPs positively influenced rural household food security in Kajuru LGA, Kaduna State. Finally, the cost of NTFPs is negative but significantly affects NTFPs utilization at 1%. The implication is that NTFP utilization increases with a unit decrease in costs.

The R^2 of 0.681 showed that 68.1% of the variation in the level of utilization of NTFPs is explained by the variation of independent variables in the model. The null hypothesis was rejected since there is a significant relationship between the socio-economic factors and the level of utilization.

Table 3: Binomial Logit model analysis of factors influencing utilization of NTFPs

Variables	Coefficients	S.E.	Wald	P-Value	Exp(B)
Education	0.459	0.884	0.270	0.603	1.583
Age	0.279*	0.154	3.287	0.070	1.322
Gender	-16.963	17306.844	0.000	0.999	0.000
Income	-0.492**	0.221	4.970	0.026	0.611
Marital Status	-20.232	47332.326	0.000	1.000	0.000
Household Size	60492.599***	20393.402	2.966	0.003	1.276
Occupation	-52.398	38125.558	0.000	0.999	0. 000
Cooperative Membership	-13.353	6822.600	0.000	0.998	0.000
Utilisation Experience	507.433*	284.344	0.222	0.076	1.785
Extension Contact	4.921	10047.589	0.000	1.000	137.163
Credit Accessibility	-183.837	117287.252	0.000	0.999	0.000
NTFPs Cultural Value	-18.571	20052.515	0.000	0.999	0.000
Language	9.381	7063.469	0.000	0.999	11857.369
Religion	-1.082	0.750	2.085	0.149	0.339
Knowledge of Use	7618.089**	3734.090	0.472	0.040	2.042
Attitude to Use	-0.209	0.603	0.121	0.728	0.811
Perception of Use	0.428	1.307	0.107	0.744	1.534
NTFPs cost	33431.956***	4218.608	-1.315	0.000	-7.925
Constant	291.110	176673.707	0.000	0.999	2.677E+126

Pseudo $R^2 = 0.681$ *= 10%; ** = 5%; *** = 1%

CONCLUSION AND RECOMMENDATIONS

Based on the findings of the study, it was concluded that fish was the most utilized NTFP. The study further concluded that the utilization of NTFPs was affected by the following factors: age, income, household size, utilization experience, knowledge of use, and NTFP cost. Also, there was a significant and positive relationship between age, household size, utilization experience, knowledge, and level of utilization of NTFPs, while it was negative and significantly related to income and NTFPs cost. This study found that the cost of NTFPs significantly had an inverse relationship with utilization. Therefore, sustainable cultivation, collection, processing, and trading of NTFPs should be harnessed by the National Park Services to make the products affordable to users, while not undermining the internally generated revenue objective of the government

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