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THE BEHAVIOR OF RURAL DWELLERS TOWARDS NON-TIMBER FOREST PRODUCTS UTILIZATION IN NORTH CENTRAL NIGERIA

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ABSTRACT

The study examines the behavior of rural dwellers towards non-Timber Forest Products utilization in North Central Nigeria. Data was gathered through the administration of questionnaire to 251 proportionally selected rural dwellers from 9 purposively selected communities in the 3 Local Government Areas of the 2 States that represented the North Central. The data was analyzed using mean score and binomial logit. The study showed that the rural dwellers had very high knowledge (≥2.1), favorable attitude and positive perception of NTFPs utilization. The result of the binomial logit regression revealed that age, income, household size, utilization experience, knowledge of use and NTFPs cost significantly influenced the utilization of NTFPs. Sustainable cultivation, harvesting, processing and utilization of NTFPs through enlightenment campaigns by government at all levels, domestication of NTFPs farming such as mushroom production, nailery, apiculture, rabbitry and grass cutter production, and value

addition to NTFPs by the users for enhanced income generation was recommended among others.

Keywords: *Knowledge, attitude, perception, utilization and NTFPs.*

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1. INTRODUCTION

Forestry and its products have contributed immensely to the economic development of Nigeria over the years. These resources provide for domestic subsistence and consumption needs, which in turn enhance household disposable income. In addition to their economic role, forest products act as informal insurance during periods of economic hardships and contribute directly to monetary gains through their sale (Ganiyu, 2023). Forest products are generally categorized into timber and non-timber forest products (NTFPs) (Ganiyu *et al*., 2023a). Among these, NTFPs have gained increasing attention for their potential to improve rural livelihoods and support sustainable forest use. NTFPs are harvested for commercial and subsistence purposes and have been shown to contribute significantly to household income, food security, and healthcare, and the preservation of cultural values (Suleiman *et al*., 2017). According to Opute *et al*. (2020), NTFPs are defined as biological goods, products and services -excluding timber - collected from forest ecosystems for survival and trade. These include a wide variety of items such as fruits and nuts, vegetables, medicinal plants, gum and resins, bamboo, rattans, palms, fibers, grasses, leaves, seeds, mushrooms, honey, and lac.

Despite the ancient and widespread use of NTFPs, their sustainable utilization remains limited, largely due to minimal value addition and the persistence of traditional harvesting practices (Ganiyu *et al*.,2025). In many rural communities, modern processing techniques that could enhance the long-term sustainability and market value of NTFPs have yet to be adopted. Furthermore, the knowledge, attitudes and practices of users significantly influenced patterns of NTFPs utilization-shaping how, when, and in what quantities these products are used. This has resulted in a notable disparity between user demand and supply from producers. In light of these challenges, this study examined the behavior of rural dwellers towards NTFPs utilization in North Central Nigeria. The aim is to establish the resilience of the users to changing environmental and socio-economic conditions that ascertain communities' resilience and livelihood stability.

The specific objectives were to:

i) assess the level of knowledge, attitudes, and practices (KAP) of rural dwellers regarding the utilization of NTFPs in North Central Nigeria; and,

ii) determine the key factors influencing the utilization of NTFPs by rural communities in the study area.

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

2. REVIEW OF LITERATURE

Non-Timber Forest Products (NTFPs) referred to as all the resources or products that may be extracted from forest ecosystem and are utilized within the household or are marketed or have social, cultural or religious significance (Mahonya *et al*., 2019). They include fruits and nuts, vegetables, medicinal plants, gum and resins, essences, bamboo, rattans and palms, fibers and flosses, grasses, leaves, seeds, mushrooms, honey and lac. Adeniran and Adebayo (2022) included wild and managed game, reptiles, fish and insects to these examples by defining NTFPs as all tropical forest products (plants and animals or parts) other than industrial timber, which are (or can be) harvested for human use at the level of self-support or for commercial purposes.

2.1 Theory of Planned Behavior (TPB)

The theory of planned behavior was propounded by Ajzen (1991). It is a theory used to understand and predict behaviors. The theory posits that behaviors are immediately determined by behavioral intentions and under certain circumstanc0es, perceived behavioral control (Kan and Fabrigar, 2017). The theory proposes that behavioral intentions are determined by a combination of three factors viz: attitude toward the behavior; subjective norms; and perceived behavioral control. Essentially, the TPB (Ajzen, 1991) extends the Theory of Reasoned Action (Ajzen and Fishbein, 2005), to account for conditions where individuals do not have a complete control over their behavior. The TPB asserts that behavior (B) is a direct function of behavioral intention (BI) and perceived behavioral control (PBC) and that behavioral intention is formed by one's attitude (A),

which reflects feelings of favorableness or unfavorableness towards performing a behavior; subjective norm (SN), which reflects perceptions that significant referents desire the individual to perform or not to perform a behavior; and perceived behavioral control (PBC), which reflects perceptions of internal and external constraints on behavior (Ajzen, 1985,1991).

Ajzen (1991) concluded that behavior is a weighted function of intention and perceived behavioral control; and intention is the weighted sum of the attitude, subjective norm and perceived behavioral control components. A strong premise of the theory is that, at the conceptual level, links among influences on behavior and their effects are captured through one of the components of the model or relationships in the model. Furthermore, Ajzen (2019) concluded that the theory of planned behavior provides a useful conceptual framework for dealing with the complexities of human social behavior. According to him, the theory incorporates some of the central concepts in the social and behavior sciences, and it defines these concepts in a way that permits prediction and understanding of particular behaviors in specified contexts. Attitudes toward the behavior, subjective norms with respect to the behavior, and perceived control over the behavior are usually found to predict behavioral intentions with a high degree of accuracy. In turn, these intentions, in combination with perceived behavioral control, can account for a considerable proportion of variance in behavior.

From a general view, however, application of the theory of planned behavior to a particular area of interest, such as theory

of Planned Behavior Approach to Understand the Influence of Green Perceived Risk on Consumers' Green Product Purchase Intentions in an Emerging Country (Nguyen *et al*., 2019) provides a host of information that is extremely useful in any attempt to understand these behaviors, or to implement interventions that will be effective in changing them (Van Ryn and Vinokur, 1992). Intention, perception of behavioral control, attitude toward the behavior, and subjective norm each reveals a different aspect of the behavior, and each can serve as a point of attack in attempts to change it. The underlying foundation of beliefs provides the detailed descriptions needed to gain substantive information about a behavior's determinants. It is at the level of beliefs that we can learn about the unique factors that induce one person to engage in the behavior of interest and to prompt another to follow a different course of action.

The TPB model has been successfully applied in a wide diversity of consumption behavior. However, the TPB framework has been criticized for the weak relation between intentions and actual behaviors. Armitage *et al*. (2012), also reaffirmed that there are few domains with specific factors in this model. Behavioral studies in the recent time, noticed an increasing evident in the psychological literature to include additional constructs in the TPB with various domains to improve the predictive power of the framework (Nguyen *et al*., 2019; Bryce *et al*., 2017). Although the TPB overall has been found to be an effective tool for predicting pro-environmental or health behavior intentions, the model has some limitations. Further, the current literature has argued strongly that green perceived risk is an important part of our decision-making process and influences behavior towards green products consumption

(Yaduma, 2023; Chen and Chang, 2013a; Chen and Chang, 2013b). But there is no research that has examined the relationship between NTFPs utilization and the livelihood of the users in Kwara and Niger States, Nigeria. Thus, this research tried to include an additional construct, NTFPs, in it to investigate the utilization intentions in Kwara and Niger States, Nigeria.

Consequently, according to this theory, whether or not an individual uses NTFPs can be traced back to his or her beliefs about the benefits that will be derived from its use. Individual differences such as age, experience, or educational background affect these beliefs which in turn affect whether or not NTFPs are used through attitudes, knowledge and perceptions. In applying this theory, utilization can be defined as the active use of the NTFPs and to model it as a quantitative variable. This study applies the TPB as a framework for understanding NTFPs utilization in line with its application by Nguyen, *et al*. (2019), as a framework for understanding green or non-green vegetable choice in Vietnam. In using the TPB, it is important not only to specify whether a person uses NTFPs but what it is used for. The research will quantitatively indicate how the effect of NTFPs utilization can influence the livelihood of the users. Therefore, the critical point of testing the theory in the subject of utilization describes the main psychological causes of these behaviors and the contribution of the research will provide valuable knowledge that can be used for predicting and influencing behavior, for instance in terms of influencing attitudes (ATT) or making it easier or more difficult in NTFPs utilization.

The TPB is a judicious decision-making model using attitude (ATT), subjective norm (SN), and perceived behavioral control (PBC) to predict behavioralist intention. This concept model mentions one's judgment to a specific behavior, the perception of other people's effect as to whether they would approve or disapprove of the performance of that behavior, and their perception of control over performing the behavior respectively. With regard for NTFPs utilization, the users prefer to use NTFPs in a healthy environment if they assess it positively, they perceive social pressure to use it, and believe real organic products. The TPB discovers the reason of behavior through the individual's beliefs and it is very useful in explaining the environmentally friendly behavior (Alagarsamy *et al*., 2021; Nguyen *et al*., 2019; Akintunde, 2017). Based on the above discussion, the aim of this study is to use the TPB to examine the KAP of users of NTFPs in the study area. The application of this model to this study is that the model provides further explanations into the connection between knowledge, attitude, perception as they influence non-timber products utilization. Knowledge is not a specific component in the model but "attitudes are a function of beliefs"; since in this context, beliefs refer to knowledge about a specific behavior.

2.2 Conceptual Framework

A conceptual framework is the end result of bringing together a number of related concepts to explain and give a broader understanding of the phenomenon under research (Shikalepo, 2020; Imenda, 2014). This implies that a conceptual framework is a synopsis of various findings from the literature sources that have been reviewed about the research, setting out the

research agenda for increased understanding of the research intentions. The understanding is achieved by providing a structure that organizes the currents of thoughts that provide focus and direction to an inquiry (Akintunde, 2017).

It represents the organization of central ideas or concepts from research, policy statements and other professional wisdom that guide the research project (Shikalepo, 2020). The conceptual framework organizes the key concepts in the study in order to define the focus and direction for the study. The key concepts are derived from reviewing the related topics and phrases existing in literature, and from the findings of the literature theories. Thomas (2012) revealed that a conceptual framework emerges from wide and intensive reading of relevant literature, and links research projects to ongoing conversations in the researcher's field by establishing the following parameters; firstly, it reminds the researcher what is the focus and what is not the focus of the research project, and secondly, it provides direction for the formulation of research questions, the research design and the further search for the literature to review. In addition, a conceptual framework provides coherence to the researcher's thoughts, making it easy to convey how and why the researcher's ideas matter relative to existing bodies of ideas embodied in the research area, as well as in relation to the writings and experience of other scholars in the discipline (Schram, 2006).

Broadly considered, a conceptual framework according to Imenda (2014), may culminate into the development of theories, explaining how certain processes happen and the relationship existing between the different inputs and outputs

of a process. Hence, it is essential to first review all relevant sources and theories to get the main phrases and concepts raised in the arguments in relation to the research, which phrases and concepts can then be used as a basis to construct a conceptual framework for the research. This implies that a conceptual framework is an end product of findings from the sources reviewed, thus the last section of the chapter dealing with the review of related literature. Writing a conceptual framework without comprehensive literature reviews is not only illogical for having no basis to lay the framework, but also runs the risk of omitting important concepts, key findings and phrases which could have added value and substance to the framework, or risk having to re-consider the framework for updating every time a new concept is found, thus time-consuming. The conceptual framework describes the relationship between specific variables identified in the study. It furthermore outlines the input, process and output of an entire investigation (Adom *et al*., 2018; Akintunde, 2017).

Summarizing the importance of conceptual frameworks in conducting educational research, Chukwuedo *et al*. (2021) stated that a conceptual framework helps researchers to: a) tell the theoretical components of their research, b) model relationships between theories and variables, c) reduce theoretical data into statements or models for easy comprehension, d) provide theoretical basis for research design, analysis and interpretations, e) assist researchers to visualize and explain what they intend to investigate. The above essentials signify the strategic function of the conceptual frameworks in the execution of research projects, by informing the shape of research projects in different components and

outlines. Hence, it is vital to acquire a balanced understanding of conceptual frameworks so that researchers can construct conceptual framework correctly, and apply it appropriately in research projects. The following section presents a narrative and schematic orientation of a conceptual framework for reinforced comprehension. This study attempts to contribute to better understanding of factors affecting NTFPs utilization in North Central, Nigeria. The interest here is first, to know the socio-economic, institutional, cultural and sociopsychological characteristics of NTFPs users and know whether or not these factors influence utilization levels. Second, to know how the utilization of NTFPs influence the livelihood of users in the study area.

2.3 Conceptual Model

A model is a blueprint for action, describing what happens in reality in a universal way (Akintunde, 2017). Conceptual model according to Ekong (2003), is a broad system of explanation which is founded not so much on prior research findings but largely on untested and perhaps unprovable assumptions about realities. The interest of the conceptual model is in the explanation of the ways in which social life is organized and ordered as well as the ways in which change comes into the society. The basic assumptions in this study are that NTFPs users socio-economic characteristics, institutional factors, cultural factors and sociopsychological factors would play a significant role in influencing utilization of non-timber forest products to bring about changes in the livelihood of the users. This is shown in Figure 1, where the independent variables, including socioeconomic, institutional characteristics, cultural

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factors and sociopsychological factors are expected to have influence on the dependent variable (utilization). This influence is denoted by the block arrows (Fig 1).

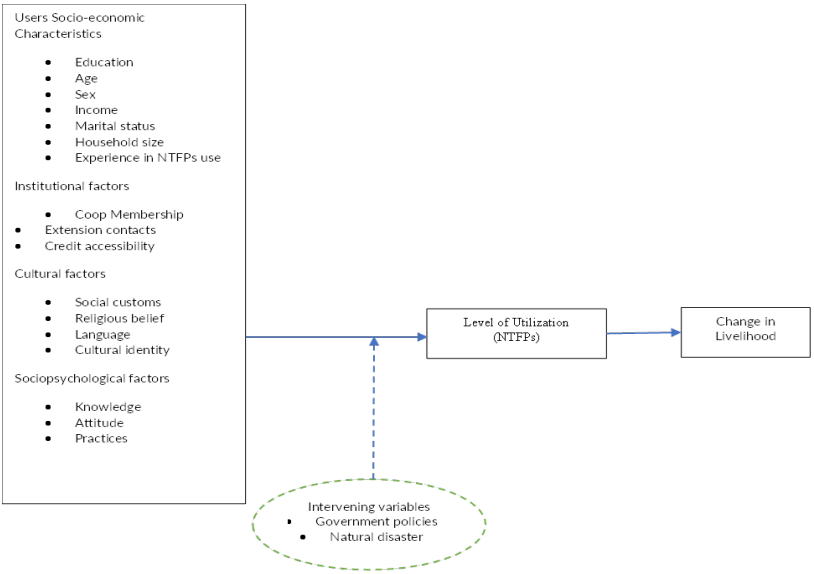

Figure 1. Model of Factor Affecting Utilization of NTFPs and its effects on users Livelihood

Thus, Figure 1 showed that the educational level of the users for instance, is expected to influence the utilization of NTFPs as a result of increased awareness of NTFPs caused by increased level of education which is expected to improve the livelihood of users. In other words, the more the level of education of the user of NTFPs, the more his expected level of usage of NTFPs. Also, age of the user in figure 1, for instance, is expected to have a positive influence on utilization of NTFPs, since the aged tried

to avoid experimentation than the younger ones as it applies to the utilization of herbal tea, snail and honey. This will invariably improve standard of living by promoting the livelihood of users through rational expenditure on household food and medicament needs. Furthermore, gender is expected to be positively related to utilization of NTFPs, since the male are usually the head of household and would rationally utilizes healthy products that are aimed at saving costs and improving high standard of living. Similarly, income of users is expected to be positively related to NTFPs utilization since an increase in income of user is expected to lead to a proportionate increase in the utilization of NTFPs like honey, snail, herbal tea and hand sanitizers.

Consequently, marital status of the users of NTFPs is expected to positively influence utilization and by implication promote livelihood since a married household head is expected to utilize more NTFPs than the single user. Sequel to this, membership of cooperative society is expected to increase the utilization of NTFPs since the users can access fund to buy the products or get products supply through cooperative society as in the case of supply of shea butter crème, honey and *Irvingian gabonensis* seed (ogbonor). The experience of the user in the utilization of NTFPs is expected to increase the level of usage and consequently promote livelihood through increased demand for the products. Obviously, institutional factors (extension contacts and credit accessibility) is expected to increase utilization of NTFPs and promote livelihood. The more the extension contact and credit accessibility, the more is expected to be the utilization of NTFPs in the study area (Fig 1).

Cultural factors (material culture, language, religion and values) are expected to positively influence the utilization of NTFPs in the study area. Religion and material culture in the study area influence the utilization of kolanuts, date palm and honey in marriage and naming ceremony. Also, value system in the study area attached more value to the use of shea-butter for both cooking oil and medi-care. Thus, the more the practice of these cultural beliefs and religion, the more will be the utilization of NTFPs in the study area, thereby promoting the livelihood of the inhabitants. Finally, sociopsychological factors (KAP) is expected to influence the utilization of NTFPs. An increase in knowledge of a NTFP is expected to lead to a proportionate increase in the utilization of the product, as in the case of the use of shea butter for cooking oil, cosmetics and lubricants of household utensils. Attitude of the users of NTFPs also influence its utilization. Thus, positive or negative evaluation of users of NTFPs will influence its utilization and promote good livelihood of the users. Above all, the perception held by users on NTFPs utilization will influence its use positively in the area.

However, intervening variable like government policy can also influence user's decision to utilize NTFPs or not. Forest conservation policy that prohibits hunting in reserved areas in the study area will negatively affect the utilization of NTFPs like wildlife's, shea butter both for food and medicine in the study area, and consequently affect the livelihood of the users around the reserved areas. Similarly, natural disaster such as COVID - 19 pandemic and climate change effects can adversely influence the utilization of NTFPs and subsequently influence the livelihood of the users (Fig 1). While COVID – 19 pandemics is expected to increase the utilization of NTFPs like hand

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sanitizers and herbs, climate change will reduce the availability as well as accessibility to the use of NTFPs. The focus of this study did not capture these intervening variables because they are external factors.

3. RESEARCH METHODOLOGY

The study was carried out in North Central, Nigeria. As a result of the extensive nature of the study area, two (2) states viz: Kwara and Niger, were purposively selected to represent the North Central geo-political zone of Nigeria. This is due to the availability and extensive use of NTFPs and the presence of Kainji Lake National Park observed in these 2 states. Kwara State comprised of sixteen Local Government Areas. Based on an annual growth rate of 2.8% (Ganiyu et al., 2023a), the estimated population of the State by 2024 is 3,499,406 million persons. Niger State on the other hand had twenty-five Local Government Areas with a land area of 74,244 square kilometers. The projected population based on 2.8% growth rate in 2024 is 5,941,175 persons.

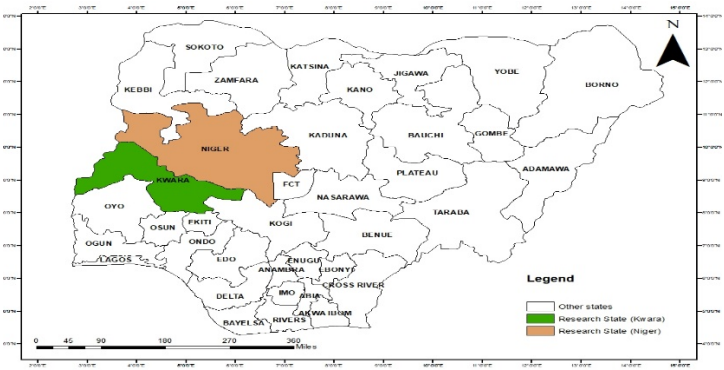

Figure 2. Map of Nigeria showing Kwara and Niger States

A multi-stage sampling technique was employed in selecting the respondents. In stage 1, three (3) LGAs were Purposively selected from each State, based on the availability, harvesting and utilization of NTFPs. These included: Kaiama, Baruten and Ekiti in Kwara State; Borgu, Mokwa and Lapai in Niger State. This gave a total of six LGAs for the two States. In the second stage, three communities were purposively selected from each LGA based on the prominence of NTFPs utilization. In Kwara State, 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 LG. In Niger State, the communities were: Babana, Wawa and Sabon Pegi from Borgu; Mokwa, Kpaki, and Bokani from Mokwa and Adagba, Baban Gwari and Lapai from Lapai LG.

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

Binomial Logit model: The model involves cases where the observed outcome can have only two possible values (Ganiyu, 2023). 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 utilization of NTFPs (Y_U) and socio-economic, institutional and cultural and psychological characteristics (X) of the users of NTFPs. The conceptual model was specified as:

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

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; $\beta_{1...}$ β_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= favorable; 0 = otherwise); X_{16} = perception of user on NTFPs (1= positive 0= otherwise).

4. RESULTS AND DISCUSSION

4.1 Behavior of NTFPs users

The behavior of NTFPs utilization in the study area showed that the rural dwellers had very high knowledge of use of fruits/ vegetables (2.7), locust bean (2.6), charcoal (2.6), fish (2.5), fuelwood (2.4), honey (2.2), bushmeat (2.1), shea oil (2.1), chewing stick (2.3) and kolanut (2.1). This is in line with the findings of Olagunju *et al*. (2020), where it was observed that rural women level of knowledge in agroforestry practices was high. However, there was low knowledge in the use of bitter cola (1.8), moringa (1.5), snail (1.5), tamarind (1.5) and mushroom (1.4). The implication of this is that the users will be more dispose to the use of NTFPs which they have high

knowledge of utilization due to their accessibility. On the other hand, they are indisposed to the use of NTFPs with low knowledge probably because the products are not readily accessible in the area. This is in tandem with the finding by Amusa *et al*. (2017), that market knowledge of NTFPs were significantly positively correlated to socio economic characteristics of traders.

The attitudes towards the utilization of NTFPs can vary among rural dwellers. Their attitude towards the utilization of NTFPs shows a high mean score with respect to fruits/vegetables (2.7), locust bean (2.6), fish (2.6), charcoal (2.5), fuelwood (2.5), chewing stick (2.2), kola nut (2.2) and honey (2.1), implying that the users showed favorable attitude towards their use. This is in line with the findings of Akinnagbe and Oluwasola (2017), where it was reported that majority of the local communities in southwestern Nigeria had positive attitudes towards NTFPs, recognizing their economic and cultural importance. However, the users' attitude towards the utilization of shea oil (2.0), bitter kola (1.8), bush meat (1.7), tamarind (1.6), moringa (1.5), mushroom (1.5) and snail (1.4) were unfavorable. This conforms with the submission by Ige, *et al*. (2019), who revealed that while some stakeholders had positive attitudes towards NTFP utilization, others do not. Moreover, there is prohibition in hunting of wildlife in areas occupied by the Kainji Lake National Park, thereby leading to scarcity of bush meat and consequently, unfavorable attitude towards its utilization.

The rural dwellers practices towards NTFPs utilization indicated a high mean score for the use of fruits/ vegetables (2.8), locust bean (2.8), fish (2.8), honey (2.3), charcoal (2.1), fuelwood (2.1),

chewing stick (2.1) and kola nut (2.1). This implied that users have positive practice towards their utilization in the study areas. This submission agrees with that of perceptions of forest dependent communities towards NTFPs utilization and its contribution to their livelihoods by Adekunle *et al*. (2020). However, the users showed negative practices towards the utilization of shea oil (2.0), bush meat (1.8), bitter kola (1.8), moringa (1.7), mushroom (1.7), snail (1.6) and tamarind (1.6). This in a way, informs their low utilization in the study areas.

Table 1. Mean response of rural dwellers behavior towards NTFPs utilization

NTFPs	Mean score K	(N=251) A	P		KAP	Decision
Bushmeat	2.1	1.7	1.8	H	UF	N
Shea oil	2.1	2.0	2.0	H	UF	N
Honey	2.2	2.1	2.3	H	F	P
Fruits and vegetables	2.7	2.7	2.8	H	F	P
Locust bean	2.6	2.6	2.8	H	F	P
Moringa	1.5	1.5	1.7	L	UF	N
Fish	2.5	2.6	2.8	H	F	P
Mushroom	1.4	1.5	1.7	L	UF	N
Snail	1.5	1.4	1.6	L	UF	N
Charcoal	2.6	2.5	2.1	H	F	P
Fuelwood	2.4	2.5	2.1	H	F	P
Chewing stick	2.3	2.2	2.1	H	F	P
Kola nut	2.1	2.2	2.1	H	F	P
Bitter kola	1.8	1.8	1.8	L	UF	N
Tamarind	1.5	1.6	1.6	L	UF	N
Aggregate mean score	2.1	2.1	2.1	H	F	P

Note: ≥2.1 = High(H), <2.1 = Low(L); ≥2.1 = Favorable (F), <2.1 = Unfavorable (UF); ≥2.1 = Positive (P), <2.1 = Negative (N).
Source: Author(s) own work.

4.2 Socio-economic, cultural and psychological factors affecting Utilization of NTFPs

Binomial Logit regression analysis was used to analyze the factors affecting NTFPs utilization. The results of the analysis showed that age (0.279, P ≤0.1), income (0.026, P ≤0.05), household size (0.003, P ≤0.01), utilization experience (0.076, P ≤0.1) and cost of NTFPs (0.000, P ≤0.01) were the socioeconomic factors that significantly affected the level of utilization of NTFPs. The implication of this is that a unit increase in age of users will lead to a proportionate increase in NTFPs utilization by the users. This conforms with *a priori* expectation since aged users tend to adopt utilization of natural resources from the forest than their younger counterparts. This is in tandem with the submission by Faleke *et al.* (2023), that farmers age had positive and significant relationship with fish output. Also, as the income of the user increases, the utilization of NTFPs decreases, same way utilization increase with a unit decrease in costs. This is in consonance with Ganiyu *et al.* (2023a), where income of household head significantly influenced utilization of NTFPs among users in Kwara State. Furthermore, a unit increase in the number of households will lead to a proportionate increase in the utilization of NTFPs. Also, the more the years of experience of NTFPs user, the more is the utilization of NTFPs.

In like manner, only the knowledge of utilization of NTFPs had positive and significant influence with utilization at 5% among the psychological factors. This implied that a unit increase in the knowledge of users on NTFPs utilization will lead to a proportionate increase in its utilization because of the

advantage of getting information of the various uses to which NTFPs could be put by the household through the internets, literatures and other avenue. This supports the submission by Ganiyu *et al.* (2023b), where knowledge of use of NTFPs positively influenced rural household food security in Kajuru LGA, Kaduna State. The R^2 of 0.681 shows that 68.1% of the variation in the level of utilization of NTFPs was explained by the variation of independent variables in the model. The null hypothesis was rejected since there is significant relationship between the socio-economic factors and the level of use of NTFPs by the users.

Table 2. Results of Regression Analysis

Variables	Exp(B)	S.E.	P-Value
Education	1.583	0.884	0.603
Age	1.322*	0.154	0.07
Gender	0.001	17306.84	0.999
Income	0.611**	0.221	0.026
Marital Status	0.001	47332.33	1.000
Household Size	1.276***	20393.4	0.003
Occupation	0. 000	38125.56	0.999
Cooperative Membership	0.001	6822.6	0.998
Utilization Experience	1.785*	284.344	0.076
Extension Contact	137.163	10047.59	1.000
Credit Accessibility	0.001	117287.3	0.999
NTFPs Cultural Value	0.001	20052.52	0.999
Language	11857.369	7063.469	0.999
Religion	0.339	0.75	0.149

Knowledge of Use	2.042**	3734.09	0.04
Attitude to Use	0.811	0.603	0.728
Practices of Use	1.534	1.307	0.744
NTFPs cost	-7.925***	4218.608	0.000
Constant	2.68E+126	176673.7	0.999

Pseudo R^2 = 0.681 / *= 10%; ** = 5%; *** = 1%.
Source: Author(s) own work.

5. CONCLUSION AND RECOMMENDATIONS

The study revealed that the users of non-timber forest products (NTFPs) had high knowledge, favorable attitude and positive practices towards the utilization of NTFPs in the study area. Consequently, users of NTFPs that demonstrate high knowledge of use, favorable attitude and positive practices tend to exhibit a sustainable, reasonable, and value-driven approach to forest resource management. Their behavior reflects informed decision making, sustainable utilization, cultural and economic valuation. Furthermore, the utilization of NTFPs was affected by age, income, household size, utilization experience, knowledge of use, and NTFPs cost, ascertaining the influence of socio-economic and psychological factors in NTFPs utilization. It can be concluded that the users act as stewards of forest ecosystems since their behavior supports sustainable livelihoods, biodiversity conservation, and the resilience of forest-dependent communities, thereby making them key stakeholders in the sustainable management of forest resources for sustained livelihood in the area.

Since the cost of NTFPs significantly had inverse relationship with utilization, sustainable cultivation, collection, processing

and trading of NTFPs should be harnessed by the National Park Services so as to make the products affordable to users, while not undermining the internally generated revenue objective of government. Also, domestication of NTFPs farming such as mushroom production, snailery, apiculture, rabbitry and grass cutter production, and value addition to NTFPs by the users for enhanced income generation should be embraced.

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