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# DETERMINANTS OF THE CONTRIBUTION OF NON-TIMBER FOREST PRODUCTs (NTFPs) To RURAL HOUSEHOLD FOOD SECURITY IN KAJURU LOCAL GOVERNMENT AREA OF KADUNA STATE, NIGERIA

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## ABSTRACT

*The study examined the determinants of the contribution of Non-Timber Forest Products (NTFPs) to household food security in Kajuru Local Government Area, Kaduna State, Nigeria. Data were gathered through the administration of a questionnaire to 120 randomly selected households from 5 purposively selected districts in the LGA. The data were analyzed using descriptive statistics, Likert- type scale, and logit regression. The result of the analysis showed that the respondents were aged population (69.1%), mainly male (70.9%) and married (80%) with a family size of 5 – 8(55%) and secondary education (52.5%). Furthermore, the result of the Likert scale showed that the household is food secured while the regression analysis revealed that education, frequency of extension contacts, and occupation of household head significantly determined NTFP's contribution to food security in the area. the study recommended the acquisition of NTFPs utilization skills by the household head, increased frequency of extension contacts, and formation of cooperative societies.*

***Keywords***: *Non-Timber Forest Products, household, food security, determinants.*

## INTRODUCTION

Nigeria is unable to meet domestic food requirements through agriculture and this challenge coupled with the alarming state of insecurity in some parts of the country and climate change has hitherto made the situation of food shortage and insecurity worse (FAO, 2020). Millions of people in developing countries depend on food from forest trees to supplement their own food needs (Aminu *et. al*., 2017). Forest resources are sources of food, shelter, building materials, fuel, cash income, and medicine for millions of people. These resources consist of timber and non-timber forest products. Non-Timber Forest Products (NTFPs) are plant and animal resources in their biological origin that are collected or gathered from forest areas as well as farmlands, man-made plantations, trees outside forests, and other common lands (Famuyide *et. al*., 2013). NTFPs have attracted global interest due to their potential for alleviating poverty and improvement of rural livelihood (Alex *et al*., 2020). Non-Timber Forest Products include numerous forest extracts such as bark, roots, tubers, leaves, fruits, flowers, seeds, resins, honey, mushrooms, and firewood (Sunderland *et. al*., 2013).

Non-Timber Forest Products (NTFPs) are particularly important for poor households as they provide an available, accessible source of a diverse range of foods source. Especially important are fish and wild animals, leaves, nuts, and mushrooms. For some forest foods such as bush meat, consumption is limited by supply. They also contribute to poverty alleviation through the generation of income, provision of food, medicine, and foreign earnings (Suleiman *et. al*., 2017). Furthermore, there are issues and concerns relating to the extent to which NTFPs contribute to household food security and income. Food security is a situation that exists when all people at all times have physical, social, and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life (FAO, 2012). By definition, food security is therefore not simply about the availability of food, it also entails accessibility that is the ability of individuals or a nation to acquire food on a sustainable basis, and its reliability and distribution (Babasanya *et. al*., 2021). It is in view of these that the study sought to analyze the determinants of the contribution of NTFPs to household food security in Kajuru's local government, Kaduna State, Nigeria.

## PROBLEM STATEMENT

Non-Timber Forest Products (NTFPs) receive little attention from social scientists and development planners (Adejoba *et. al*., 2020) perhaps because of the small scale and dispersed nature of extractive activities. Solomon *et. al*. (2018) noted that most Non-Wood Forest Products in Nigeria and Sub-Saharan Africa provide both social and economic benefits to the livelihoods of rural communities. At the subsistence level, these products normally address livelihood strategies like secure provision of food, health care needs, and concerns to reduce risk factors. The economic benefit of Non-Timber Forest Products has been neglected for the past decades. Most research has been on agricultural production without consideration for NTFPs despite their contribution to household livelihoods.

## OBJECTIVES OF THE STUDY:

The specific objectives are to:

i. describe the socio-economic characteristics of rural households in the study area;
ii. identify the Non-Timber Forest Products in Kajuru local government Area;

iii. describe the food security status of rural households in Kajuru Local Government Area; and,
iv. examine the determinants of the contributions of NTFPs to rural households' food security.

## METHODOLOGY

**Study Area:** The study was carried out in Kajuru local government area. Kajuru was created in March 1997. Kajuru Local Government has a population of 69,698 thousand people according to the 2006 population census (NPC, 2006). The people in the local government are predominantly farmers. They cultivate crops such as soybean, groundnut, rice, maize, sorghum, millet, ginger, and yam. They also rear livestock like cattle, sheep, goats, poultry, etc.

**Data Collection:** Data were collected from the respondents using a well-structured questionnaire. Data were collected on variables such as education, sex, income, and NTFPs used among others, to meet the stated objectives of the study.

**The Sampling Techniques/ Procedures:** Multi-stage sampling technique was used for the study. In the first stage, five districts were purposively selected as a result of the predominance of activities of NTFP involvement by rural households in the study area. In the second stage, two villages were selected from each of the five selected districts. In the final stage, twelve rural households were randomly selected from the selected villages which gave a total of one hundred and twenty respondents (120).

**Analytical Technique:** The tools of analysis that were used for the study include; descriptive statistics, Likert- type scale, and logit regression.

**Descriptive Statistics:** Descriptive statistics were used to describe the basic features of the data in the study area. Therefore, descriptive statistics were used to achieve objectives i and ii.

**Likert scale:** This involved the use of a 3- point Likert type scale, that was used to achieve object iii of the study. To describe the food security status of rural households in the study area (iii), the Household Food Insecurity Access Scale (HFIAS) on a nine questions response of yes or no was used. The questions were captured on a 3-point Likert-type scale of rarely, sometimes, and often with a score of 1,2, and 3 respectively. A summation of scores for each respondent was determined and the point of average and above was accepted as food secure.

3.4.3 Logit Regression:

The basic logit model is given by

$$\text{Ln}\left(\frac{P}{1-P}\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots \beta_n X_n$$

Where;

$L_1 = 1_n$ (1) = If household is food secure
0

$L_1 = 1_n$ (0) = If household is not food secure
1

$\beta_0$ = the intercept which is constant

$\beta_{1\ldots} \beta_i$ = coefficient of determinants of utilization of NTFPs

The explanatory variables used in the logit models are hypothesized as determinants of household food security

$X_i$ = set of independent variables as specified below:

$X_1$ = sex of users (male= 1; female= 0)

$X_2$= age of users (in years)

$X_3$= marital status (1= married; 0 = others)

$X_4$= cooperative membership (member =1; non-member =0)
$X_5$ = size of household (number of persons living and feeding together)
$X_6$ = Education of household head (years spent in school)
$X_7$ = extension contact (number of extension visits in the last year)
$X_8$= occupation
$X_9$ = income from NTFPs (₦)
$X_{10}$ = knowledge of NTFPs by user (1= adequate; 0= inadequate)

## RESULTS AND DISCUSSION

### Socio-economic Characteristics of Respondents

Results in Table 1 showed that 35.8% of the respondents were between the age range of 41 and 50 years. This is followed by 33.3% who were above 50 years while only 15.8% and 15% of the respondents were in the age range of ≤ 30 years and 31 to 40 years respectively. This implied that the aged population participates more in NTFP trade either as users or collectors in the study area. This is consistent with the findings by Ganiyu *et al*. (2021) where most of the women participating in agricultural extension activities in Kaduna State are of the aged population. The respondents' distribution by gender shows that the majority (70.9%) of the farmers were males while their female counterparts only represent 29.2% of the rural households' population. This implied that male-headed households lay emphasis on NTFPs as their source of livelihood while the women prefer less tasking agricultural activities like processing. This is consistent with Balogun *et.al.* (2011) on the "appraisal of perception on environmental forestry in Ebonyi State where 75% of the respondents are male. Similarly, the majority (80%) of the respondents were married as shown in Table 1. Only 18.3% and 1.7% of the rural households were single, and widow respectively. This implies that family labour will be readily available for use in the assessment and collection of NTFPs in the study area. This is in line with the submission by Ganiyu *et.* a*l.* (2016) on the "Socio-economic factors influencing the adoption of forest conservation Practices in Birnin-Gwari local government of Kaduna State" where 75% of the farmers were married.

Furthermore, the classification of respondents by household size shows that most (55%) of them have a family size of 5 – 8 members. This is closely followed by those with 9 – 12 members (28.3%). Respondents with a household size of 1 – 4, and above 12 occupied 10.8%, and 5.8% respectively. The average family size is 9 members. This confirms the use of family labour by the households in the study area. The result is consistent with the submission by Olagunju *et. al.* (2020) where rural women involved in agroforestry practices in Kaduna State had 6 -10 household members. The respondent's distribution by their level of education shows that most (52.5%) of them are educated at the secondary level. Respondents with secondary education are closely followed by those with primary education and tertiary representing 25 and 20.8% respectively. Only 1.7% of them had no formal education in the study area. This implies that farmers in the study area will readily accept technology that can affect their productive capacity positively when given the opportunity. This conforms to Bankole *et.al.* (2020) where 63% of farm youth in rural communities of the Federal Capital Territory were users of social media.

Table 1: Distribution of Respondents by socio economic characteristics

| Characteristics | Frequency | Percentage |
|---|---|---|
| **Age** | | |

| | | |
|---|---|---|
| ≤ 30 | 19 | 15.8 |
| 31 – 40 | 18 | 15.0 |
| 41 – 50 | 43 | 35.8 |
| > 50 | 40 | 33.3 |
| **Gender** | | |
| Male | 85 | 70.9 |
| Female | 35 | 29.2 |
| **Marital Status** | | |
| Single | 22 | 18.3 |
| Married | 96 | 80.0 |
| Widow | 2 | 1.7 |
| **Household size** | | |
| 1 – 4 | 13 | 10.8 |
| 5 – 8 | 66 | 55.0 |
| 9 – 12 | 34 | 28.3 |
| Above 12 | 7 | 5.8 |
| **Education** | | |
| Non-formal | 2 | 1.7 |
| Primary | 30 | 25.0 |
| Secondary | 63 | 52.5 |
| Tertiary | 25 | 20.8 |
| Total | 120 | 100 |

**Income Level**

The income distribution of respondents in Table 2 showed that most (72.5%) of them earned between ₦30,000 and ₦59,000 from NTFPs trade per month in the study area. Only 24.2% and 3.3% realized less than ₦30,000 and above ₦59,000 per month respectively. This contradicts the submission by Solomon *et.al*. (2015) where the average income of Shea fruit processors in Niger State was between ₦6,000 and ₦20,000 per month, thereby representing 43.4% of their income source. This implied that income from NTFPs accounted for the chief indicator of accessibility to food in the study area, thereby making them food secured.

**Occupation of the Respondents**

The major occupation of the respondents as seen in Table 2 is farming (42.5%). Traders and civil servants only constituted 33.3% and 24.2% of the respondents' population. This implies that the households in the study area can easily integrate agricultural crops with forest products through which they will have access to NTFPs, aside from the NTFPs in the wild for sustained food accessibility, and by implication food security in the study area. This finding is in line with that of Suleiman *et. al*. (2017) where it was posited that farming was the main occupation of the households in a study on NTFPs and their contribution to household income around Falgore game reserve in Kano, Nigeria.

**Experience of the households in NTFPs involvement in the Study Area**

The majority (69.2%) of the households in the study area had 5 - 8 years of experience in the collection, trading, and utilization of NTFPs. This is followed by those with 1 – 4 years (20.8%) experience, above 12 years (5.8%) experience, and 9 -12 years (4.2%) experience. This implied that the trade and utilization of NTFPs increased within the last 8 years in the study area. The abundance of these resources in terms of accessibility contributes in no small measure to its collection for daily utilization to secure the nutritional needs of the households as seen in condiments like locust beans. Household heads who are in these activities do teach their children to ensure that these activities are been transferred and sustained as alternative sources of livelihood to guarantee food security. Households with more years of experience tend to be more cautious in the use of NTFPs with a view to ensuring its sustainability because they know that the wellbeing of their future generation is their social responsibility.

**Cooperative Membership:** The distribution of households' heads by cooperative membership shows that they are chiefly non-members (76.6%) of cooperative societies. Only 23.3% of them belong to cooperative societies. This means that the households involved in NTFP utilization and trading in the study area will not be able to benefit from the services of cooperative societies in terms of access to loans for NTFPs business expansion and access to market information. This finding disagrees with the assessment of Shea fruits processors in Niger State, Nigeria by Solomon *et.al.* (2018) where 94.7% of the processors were members of Cooperative societies.

**Extension Contact:** The distribution of respondents by their extension contact shows that most (79.2%) of them had contact with extension agents in the study area from time to time. Only 20.8% of them do not have contact with extension agents in the study area. This means that the households will have access to information on NTFPs from time to time which will increase their awareness level of the products. Ganiyu *et.al*. (2021) opined that extension contact is a significant factor that influenced women farmers participation in extension activities in Kaduna State, Nigeria.

Table 2: Distribution of Respondents by Socio-economic and Institutional Characteristics

| Characteristics | Frequency | Percentage |
|---|---|---|
| **Income (₦)** | | |
| < 30,000 | 29 | 24.2 |
| 30,000 – 59,000 | 87 | 72.5 |
| 60,000 – 89,000 | 4 | 3.3 |
| **Occupation** | | |
| Farming | 51 | 42.5 |
| Trading | 40 | 33.3 |
| Civil Servants | 29 | 24.2 |
| **Years of experience** | | |
| 1 – 4 | 25 | 20.8 |
| 5 – 8 | 83 | 69.2 |
| 9 – 12 | 5 | 4.2 |
| >12 | 7 | 5.8 |
| **Cooperative Membership** | | |
| Yes | 28 | 23.3 |
| No | 92 | 76.7 |
| **Extension Contact** | | |
| Yes | 95 | 79.2 |
| No | 25 | 20.8 |
| Total | 120 | 100 |

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

The information on major NTFPs in the study area was extracted from the NTFPs used by the households. The study revealed that bush meat ranked 1st in the study area. This was closely followed by honey (2nd), local pea (3rd), locust bean (4th), shea nuts and baobab (5th), Tamarindus (7th), and moringa (8th). This could be because bush meat and honey 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, utilization, and trade of these products to meet their food need. However, this study considers the available resources hence only 8 products among others were selected. Below is the distribution of the NTFPs.

Table 3: Distribution of Respondents by the Major NTFPs Used

| NTFPs Type | Frequency | Percentage | Rank |
|---|---|---|---|
| Bush meat | 28 | 23.3 | 1st |
| Honey | 26 | 21.7 | 2nd |
| Local pea | 19 | 15.8 | 3rd |
| Locust bean | 14 | 11.7 | 4th |
| Shea nuts | 11 | 9.2 | 5th |
| Baobab | 11 | 9.2 | 5th |
| Tamarindus | 8 | 6.7 | 7th |
| Moringa | 3 | 2.5 | 8th |

Source: Field Survey, 2022.

**Food Security Status of the Respondents**

To determine the Food Security Status of the households with respect to their utilization of accessible NTFPs in the study area, a 3-point Likert-type scale of rarely, sometimes, and often with a score of 1,2, and 3 respectively was used. A summation of scores for each respondent was determined and the point of average (2.2) and above was accepted as food secured (FS) while points below the aggregate score were regarded as not secured (NS). As Table 4 shows, there is a high index score with respect to the utilization of NTFPs as spices and condiments (2.8), medicinal herbs (2.7), sweetener (honey) (2.6), stimulants (2.5) and fruits/vegetables (2.3) by the households. Since 5 utilization statements were significant (56%) out of the 9 statements, it implied that the households in the area are food-secured due to their access to NTFPs to meet their nutritional needs.

Table 4: Mean Response of Respondents on their Food Security Status

| NTFPs Utilisation Statement | Weighted Score 3 | 2 | 1 | Total (N=120) | Mean | Decision |
|---|---|---|---|---|---|---|
| 1. Used as Fruits/Vegetable | 47 | 58 | 15 | 272 | 2.3* | FS |
| 2. Used as Oil | 22 | 35 | 63 | 199 | 1.7 | NS |
| 3. Used as Meat | 5 | 81 | 34 | 211 | 1.8 | NS |
| 4. As Spices and condiments | 94 | 26 | - | 334 | 2.8* | FS |
| 5. As Medicinal herbs | 89 | 27 | 4 | 325 | 2.7* | FS |
| 6. As Stimulants | 76 | 30 | 14 | 302 | 2.5* | FS |
| 7. As Fibre | 19 | 73 | 28 | 231 | 1.9 | NS |
| 8. As Sweetener (Honey) | 71 | 49 | - | 311 | 2.6* | FS |
| 9. As Beverages | 37 | 52 | 31 | 246 | 2.1 | NS |
| Aggregate Score | | | | | 2.2* | |

**Determinants of the Contributions of NTFPs to Rural Household's food Security**

Logit regression analysis was used to analyze the factors that affect the contribution of NTFPs to food security in the study area. The results of the analysis were presented in Table 5. As the table shows, education ($t = 0.004$, $P \leq 0.01$); extension contact ($t = 0.018$, $P \leq 0.05$); and occupation of household head ($t = 0.026$, $P \leq 0.1$) were positive and significantly related to NTFPs contribution to food security at 1%, 5% and 10% level of significance respectively. This implies that the more educated the household head is, the higher will be the level of NTFP's contribution to food security because of the advantage of getting information on the various uses to which NTFPs could be put by the household through the internet, literature, and other avenues. This corroborates the finding of Ogunbameru *et al* (2008) and Adesope *et al* (2009). Similarly, extension contact positive and significant relationship means that the more the number of visits by extension workers, the higher will be the contribution of NTFPs to food security. This concurs with the finding by Ganiyu *et. al*. (2021) who submitted that extension contact influences the participation of women farmers in agricultural extension activities in Kaduna State. The significant relationship between the occupation of the household head showed that farming gives them access to NTFPs which they utilized to meet their food needs both from their sales and consumption.

Also, the income of the farmer is positive but insignificantly related to contribution to food security with a coefficient of 0.001, implying that the more the income derived by a farmer from NTFPs sales, the higher his level of food security. This is because more income would be realized from the sales of non-timber forest products in the long run while equally providing for the energy need of the family. This is in line with the submission by Ganiyu et. al. (2020) on farmers perception and adoption of forest conservation practices in Kaiama Local Government, Kwara State.

Table 5: Binomial logit regression result

| Variable | Coefficients | Standard Error | Sig |
|---|---|---|---|
| Gender | -1.466 | 0.780 | 0.060 |
| Age | 0.480 | 0.650 | 0.460 |
| Marital Status | 3.014 | 1.636 | 0.065 |
| Cooperative Membership | -0.305 | 0.713 | 0.669 |
| Household Size | -0.652 | 0.588 | 0.268 |
| Education | 0.326 | 0.114 | 0.004*** |
| Extension Contact | 2.754 | 1.164 | 0.018** |
| Occupation | 1.275 | 0.572 | 0.026* |
| Income | 0.001 | 0.001 | 0.311 |
| Knowledge of NTFPs | 2.826 | 2.156 | 0.190 |
| Constant | -9.106 | 3.976 | 0.022* |

Log likelihood function = 80.192 P ≤0.1*, P ≤0.05**, P≤0.01***

**CONCLUSION**: The findings of the study showed that NTFPs contributed to the food security status of the household in the study area since the products are used on a daily basis to meet the food need of the household. Furthermore, the level of education of the household head, extension contact, and occupation significantly determines NTFP's contribution to food security in the study area.

**RECOMMENDATION**: Since the education of the household head significantly determines NTFP's contribution to household food security, efforts should be made by the households to acquire more skills on NTFP utilization through training. Furthermore, the frequency of extension visits by extension agents should be increased since it is a major determinant of NTFP's contribution to food security. Finally, the household head should join the available cooperative societies in the area because most (76.6%) of them were non-members of cooperative societies.

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