FUDMA Journal of Sciences (FJS)
ISSN online: 2616-1370
ISSN print: 2645 - 2944
Vol. 8 No. 6, December, (Special Issue) 2024, pp 120 - 126
DOI: https://doi.org/10.33003/fjs-2024-0806-3005

CONTRIBUTION OF NON-TIMBER FOREST PRODUCTS (NTFPs) TO HOUSEHOLDS' DIETARY REQUIREMENT IN KAJOLA LOCAL GOVERNMENT AREA OF OYO STATE, NIGERIA

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ABSTRACT

Non-Timber Forest Products (NTFPs) contributes to dietary requirement of the households during economic shocks through food and income provisions. This study investigates the contribution of NTFPs to the dietary requirement of households in Kajola Local Government Area of Oyo State, Nigeria. Data from 120 sampled respondents were generated via a simple random sampling technique and interview schedule using a well-structured questionnaire. Descriptive statistics and inferential analytical tool (multiple regression) were used for the analysis. From the results, (60.0%) of the respondents were female. Majority (64.2%) respondents were within their youthful age group of 18-40 years. Also, majority (61.7%) of them were married. Good number (41.6%) of respondents attained secondary education qualification. Majority (38.3%)of the sampled respondents had not more than 5 household size. Equally, (77.5%) of t respondents earned between N20,000-N60,000 monthly from NTFPs sales. Wild fruits (29.2%) and Honey (28.3%) and firewood/charcoal (20.0%) are the most available and exploited NTFPs for dietary requirement by the respondents. Likewise, majority (51.7%) of the respondents sold only NTFPs to contribute to their household's dietary requirement. explicitly, (89.3%) of the NTFPs harvested were sold by the respondents' households while only (10.7%) of the NTFPs harvested were consumed. Meanwhile, variable such as respondents age, respondents' gender, family status, academic level, core occupation and households' size were all significant at 5% probability level and positively impacted NTFPs contribution to households' dietary requirement. Hence, the need for strategies and investment in NTFPs value addition for all year round dietary availability to households, and a means of economic prosperity Nigeria as a whole.

Keywords: NTFPs, Households, NTFPs availability, Dietary requirement

INTRODUCTION

According to Food and Agricultural Organization, (FAO, 2015), dietary requirement is only attainable provided people have steady, abundant financial, social, and direct access to wholesome food that satisfies their food needs and nutritional requirements for a productive and healthy life. Hence, the practical use of this idea at family level is referred to as the household dietary requirement, where the emphasis is on the individuals within households. Consequently, ownership of a productive assets or services is key to households' livelihood and sustainability (Kabir *et al.*, 2020).

However, the economic turbulence and disaster impacted by food insecurity affects the entire globe. Not less than an aggregate of one-quarter (1/4) of the entire human race, endured a food insecurity condition ranging from moderate to severe (FAO *et al.*, 2019). Given how drastically dietary imbalance impacts different parts of the world, this is not only surprising but also call for serious concerns and actions. Compared to other regions like North America and Europe, dietary insufficiency affects almost 52% of the population in Africa(FAO *et al.*, 2019).

Interestingly, Wood, and non-timber forest products (NTFPs), are the two main core forest goods and services that 15 million estimated people in Sub-Saharan Africa engaged in as a form of forest-related enterprises to earn a living and feed their families. The goods and services derived from this engagement include fuel wood and charcoal sales, commercial hunting, and handicraft production (Brian *et al.*, 2011; Angelsen and Wunder, 2003).

Non-timber forest products (NTFPs) are products that are obtained from the forest apart from wood (CIFOR, 2007). They include fruits, nuts, vegetables, fish, medicinal plants, pitches, fibers, bamboo, rattans, honey, bugs, animals, feed, fertilizers, medicinal extracts, construction materials, dyes, gums, latex and different exudates, fundamental oils, flavors and spices, consumable oils, bones, pelts, hides and skins, non-wood lingo-cellulosic items, chemicals and fragrance synthetic compounds (Kolade, 2021).

Hence, through adequate supply of wild food, fuelwood, financial income through NTFPs tradeand enhanced resilience of the ecosystems and communities underlying food production, the best use of these NTFPs helps alleviate dietary imbalance in rural households (Gitz *et al.*, 2021).

According to FAO (2018), Approximately twenty percent of the world's population, particularly impoverished women, children, rural people, and other disadvantaged groups, depend on NTFPs for adequate nutrition. Approximately twenty percent of the world's population, particularly impoverished women, children, rural people, and other disadvantaged groups, depend on NTFPs for adequate nutrition.

Moreover, NTFPs contributes to households' dietary requirement primarily via three mechanisms. Firstly, they boost households' dietary requirement by providing wild food which helps in maintaining households daily nutritional intake (Abdulla, 2013). Secondly, particularly for populations that are more susceptible, NTFPs can act as buffers during economic crises (Angelsen *et al.*, 2014; Sunderlin *et al.*, 2005). Thirdly, through provision of financial support to

households participating in the supply channel of NTFPs, they can also address dietary requirement. Alternatively, money earned from NTFPs can also be utilized to purchase additional goods that would support the nutritional needs of households (Abdulla, 2013; Chukwuone and Okeke, 2012).

Although it has been suggested that NTFPs are just as significant as other non-forest goods (that is, non-NFPs) for ensuring a household's food requirement, however their value and potentials have been grossly underutilized (Chidumayo and Gumbo, 2013). Similarly, in Nigeria there are research gaps in terms of dietary contributions of NTFPs to households survival and poverty reduction. In other words, paucity of official statistics on the contributions of NTFPs to human health, such as dietary requirement in Nigeria's rural areas, is mostly unclear (MAAHD, 2017). By and large, this research aims to investigate the contribution of NTFPs to the dietary requirement of rural households in Kajola Local Government Area of Oyo state.

MATERIALS AND METHODS

The Study Area

Kajola Local Government is located between latitude $8^0$1'35" North and longitude $3^0$21'27" East(Fig. 1) with it headquarters in Okeho. The postal code of the area is 202101. It has a total landmass of approximately664km^2 and a population of about 286,600 with annual population increase of about 2.3% from the last population census in 2006 (City Population, 2022). The area is blessed with dense tropical savanna climate characterized by a moderate wet and dry season. This vegetation significantly supports their activities in the forest and agroforestry. The average annual rainfall is 800mm spanning from March/April to October with the temperature varying between 25°C and 35°C and the relative humidity of 91% (Alarima *et al.,* 2020).

Sampling Procedure

A simple random sampling technique was used for this study. The first stage comprised random selection of four (4) local areas namely (Gbonje/Olele, Isemi-Ile/Ilua, Ayetoro-Oke and Iwere/Ilaji Oke) out of Eleven (11) wards in Kajola Local Government Area.. From each ward, thirty (30) respondents were randomly picked from the pre-generated farmers record list obtained from the farmers' head Chief at the study area then followed by the interview via structured questionnaires directed at the selected respondents. In total, One Hundred and Twenty (120) copies of questionnaires were administered for this study.

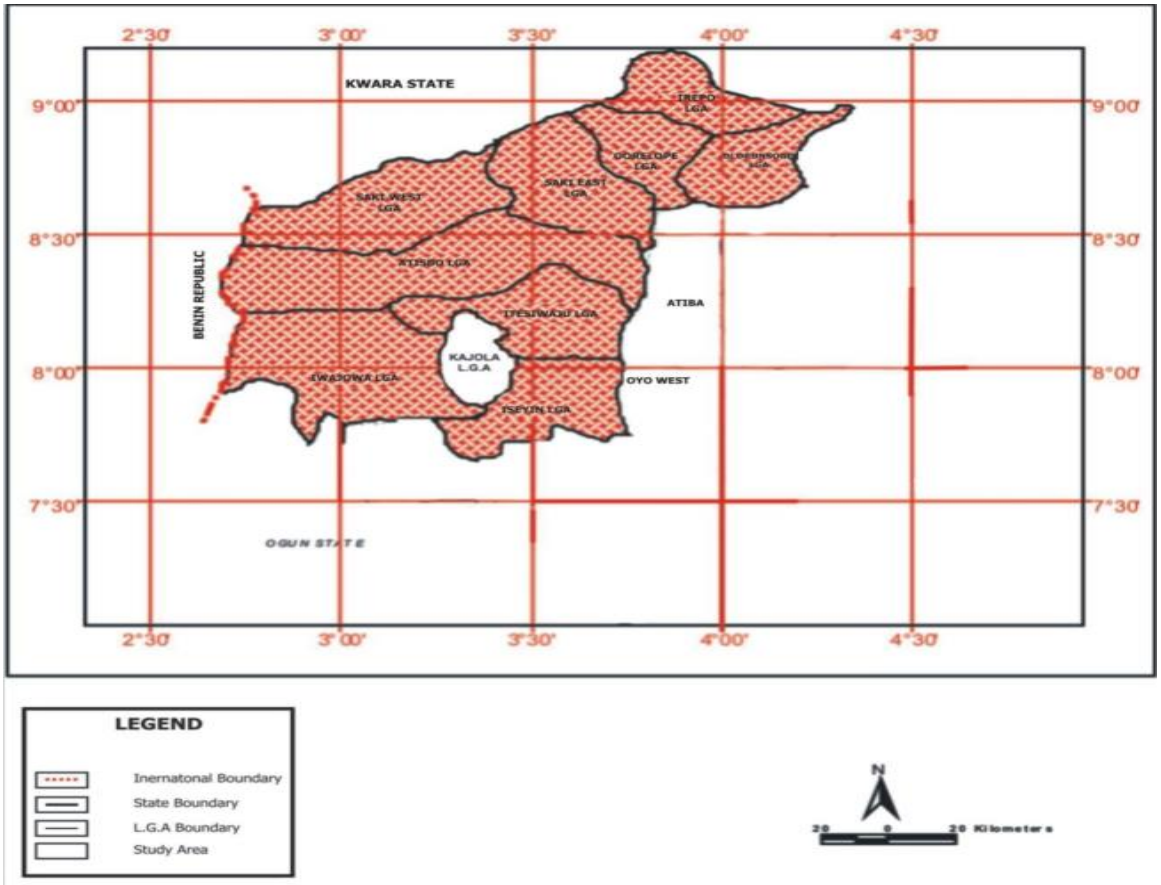

Figure 1: Map showing Kajola Local Government Area of Oyo state.
Source: Compiled via Kajola Zonal Planning Office (2013) in (Oyediran, 2014)

Statistical Analysis

Data collected were analyzed to determine the descriptive statistics which include the means, frequencies and percentage, and other socio-economic features of the sampled contributors. Inferential statistics (Multiple regression) was also used to determine the contribution of NTFPs on households' dietary requirement.

$$Y = \beta_0 + \beta i_1 X i_1 + \beta i_2 X i_2 + \beta i_3 X i_3 + \ldots\ldots + \beta n X n \quad (1)$$

Where: Y= the NTFPs retrieved from the forest areas;
β_0 =Constant term of the model;
β_1, β_2...βn = The Estimated influences of the specified explanatory variables;
X_1, X_2, to X_n = Represent the explanatory variables
X_1= Age of the sampled contributors (in years)

X_2= Education level where 1= Adult 2=Primary 3=Secondary 4=National Diploma (ND) 5= University
X_3= Household size
X_4= Main Occupation

RESULTS AND DISCUSSION

Demographic distribution of the respondents in Kajola LGA

Table 1 presents the demographic characteristics of the respondents in the study area. The result showed that 48.4% of the sampled respondents used were within the Age bracket of 31-40years, 15.8% of them were with 18-30 years of Age, 13.3% of them were within 51-60years of Age, 12.5% of them were within 41-50years of Age bracket while 10.0% of them were above 60 years of Age. Similarly, 60.0% of the sampled respondents were female while 40.0% of them were male. Additionally,, 61.7% of the respondents used were married, 16.7% of them were divorced, 13.3% of them were single while 8.3% of them were widowed. Furthermore, 41.6% of the respondents attained secondary level of education qualifications, 22.5% of them attained primary level of education qualifications, 11.7% of them had either National Diploma education qualifications or no formal education, 10.0% of them had adult level education, while 2.5% of them attained tertiary education qualification. Equally, 38.3% of the respondents had not more than 5 household members, 33.3% of them had between 6-10 household members while 28.4% of them had more than 10 household members. Also, 51.7% of the respondents were involved in NTFPs trade to provide for their households' dietary requirement, 25.8% of the respondents were involved in crop farming, 9.2% of the respondents were involved in livestock farming, 7.5% of the respondents were involved in mixed farming while 2.2% of the sampled respondents were civil servant. about the table also showed that, 54.2% of the respondents earned between ₦41,000- ₦60,000 monthly from NTFPs trade, 23.3% of them earned between ₦20,000- ₦40,000 monthly, 11.7% of them earned less than ₦20,000 monthly while 10.8% of the sampled respondents earned above ₦60,000 monthly from NTFPs trade.

Table 1: Demographic distribution of the respondents used for the study

Variable	Frequency	Percentage
Age		
18-30years	19	15.80%
31-40years	58	48.40%
41-50years	15	12.50%
51-60years	16	13.30%
Above 60 years	12	10.00%
Gender		
Male	48	40.00%
Female	72	60.00%
Marital Status		
Single	16	13.30%
Married	74	61.70%
Divorced	20	16.70%
Widowed	10	8.30%
Education Qualification		
Non-Formal Education	14	11.70%
Adult Education	12	10.00%
Primary Education	27	22.50%
Secondary Education	50	41.60%
College/Polytechnic	14	11.70%
Tertiary Education	3	2.50%
Households Size		
Up to 5 members	46	38.30%
6-10 members	40	33.30%
Above 10 members	34	28.40%
Sources of Respondents' Dietary Requirement		
Selling NTFPs	62	51.70%
Crop Farming	31	25.80%
Livestock Farming	11	9.20%
Mixed Farming	9	7.50%
Civil Servant	7	5.80%
Monthly Earnings from NTFPs		
Less than ₦20,000	14	11.70%
₦20,000- ₦40,000	28	23.30%
₦41,000- ₦60,000	65	54.20%
Above N60,000	13	10.80%
Total	**90**	**100.00%**

Source: Author's Survey, 2024

Distribution of available NTFPs sold by the respondents in Kajola LGA

Figure 2 depicted the distribution of available NTFPs sold by the respondents in Kajola LGA, the result showed that 29.2% of the respondents sold wild fruits to contribute to their households income, 28.3% of them sold honey to cater for their households' dietary requirement, 20.0% of them sold firewood and charcoal, 8.3% of them sold bush mango, 7.5% of them sold other NTFPs such as herbs, mushroom and bamboo to contribute to their households dietary requirement while 6.7% of the sampled respondents sold bushmeat to cater for their households' dietary requirement. This indicated that majority of the respondents sold either wild fruits, honey or fire wood and charcoal to cater for their household's dietary requirement.

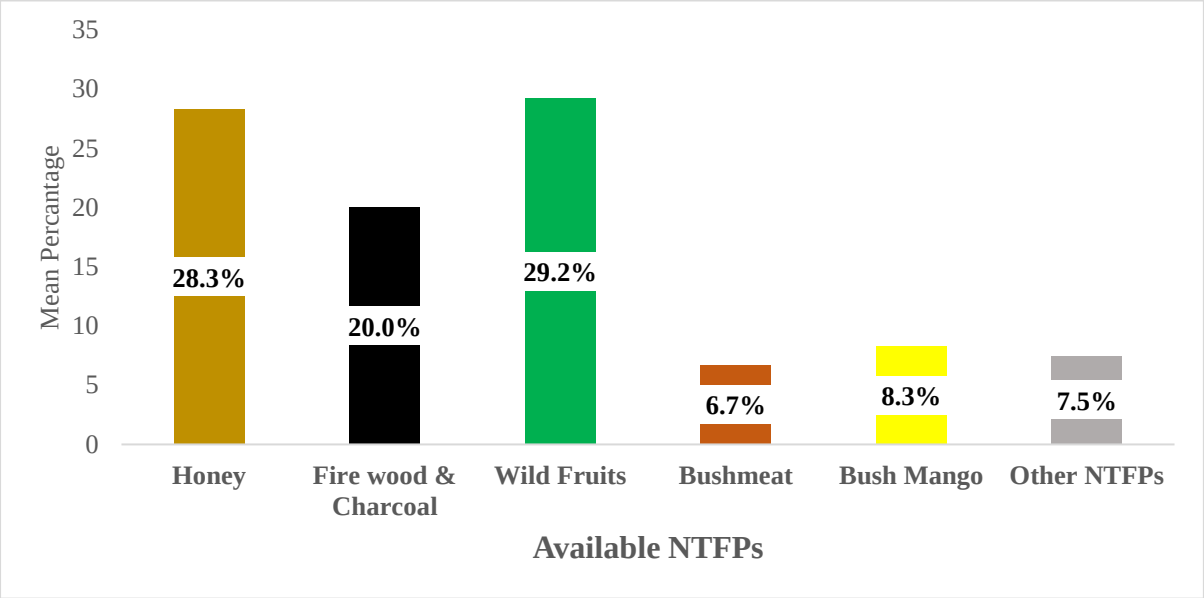

Figure 2: Distribution of available NTFPs sold by the respondents in the study area
Source: Author's Survey, 2024

Mean contributions of NTFPs to Households' Income in Kajola LGA

Table 2 presents NTFPs contribution on households' dietary requirement which showed that 88.9% of the firewood collected monthly by the respondent's household were used for trade purpose while 11.1% of the firewood collected were used for households' consumption. Similarly, 93.3% of the Charcoal collected by the respondent's household were used for trade while the remaining 6.7% were consumed by them. Also, 87.5% of the bush mango collected by respondent's household were used for trade while 12.5% of the total collected were consumed by their respective households. In the same vein, 94.7% of the wild fruits collected by the respondent's household were used for trade while 5.3% of the total harvested were consumed. However, 66.0% of the bushmeat hunted from the forest were consumed by the respondent's households while 34.0% of the total hunted were sold out. Meanwhile, 96.0% of the honey harvested were sold by the respondents to cater for households' dietary requirement while 4.0% of the honey harvested were consumed. In general, 89.3% of the NTFPs collected were sold and used to cater for households' dietary requirement by the respondents while only 16.4% of the NTFPs collected were consumed directly by the respondents' households.

Table 2: Mean contributions of NTFPs to Households' Income

NTFPs	Quantity/ Month	Amount Consumed	Amount Sold	% Consumed	% Sold
Firewood	9bundles	₦4,500	₦36,000	11.1%	88.9%
Charcoal	7.5bags	₦2,500	₦35,000	6.7%	93.3%
Bush Mango	80packs	₦1,000	₦7,000	12.5%	87.5%
Wild fruits	36.2kg	₦5,000	₦90,000	5.3%	94.7%
Bushmeat	5nos	₦15,500	₦8,000	66.0%	34.0%
Honey	20litres	₦4,000	₦96,000	4.0%	96.0%
Total		**₦32,500**	**₦272,000**	**10.7%**	**89.3%**

Source: Author's Survey, 2024

Table 3: Model Summary of demographic factors influencing NTFPs collection

Model	R	R Square	Adjusted R Square	df_1	df_2	Change Statistics	
						R^2 Change	Sig. F Change
1	0.541[a]	0.602	0.410	6	113	0.474	0.004

Predictors: (Constant), Marital status, Household size, main occupation, education level and Age

Demographic factors influencing the collection of NTFPs in Kajola LGA

The Coefficient result in Table 4 indicated that Age, education level, marital status, main occupation and household size were all significant at 5% probability level. This showed that an additional unit of increase in Age of the respondents' households will increase the contribution of NTFPs to their households' dietary requirement by 7.1%. This implied that as more household member reaches adulthood, contribution to such household dietary requirement is expected to rise. Similarly, an additional unit of increase in academic qualification of the respondents' household will increase the contribution of NTFPs to households' dietary requirement by 9.8%. This connote households with more educated member are more likely to be receptive to new innovations and technologies which could lead to increase their households' dietary requirement. Likewise, Similarly, an additional unit of increase in the number of married respondents would bring about 6.4% increase in their households' dietary requirement. In the same vein, a unit increase in number of households that engaged in NTFPs trade/business as their main occupation would result to an increase in the contribution of NTFPs to their households' dietary requirement by 52.0%. This is so because the more the households that produces/sells NTFPs the more the contribution to their households' dietary requirement. Lastly, an additional unit of increase in the households' size of the respondents' households will increase the NTFPs contribution to households' dietary requirement by 60.7%. This shows that more productivity, dietary requirement and higher income could be expected as more household members assist in NTFPs farming business. This result is significant at 95% confidence interval.

Table 4: Demographic factors influencing the collection of NTFPs in Kajola LGA

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	23.302	3.554		6.556	0.000
Age	0.071	0.031	0.038	2.290**	0.041
Education level	0.098	0.048	0.042	2.042**	0.010
Marital status	0.064	0.029	0.031	2.207**	0.001
Main occupation	0.520	0.262	0.341	1.985**	0.005
Household size	0.607	0.291	0.300	2.086**	0.004

**Level of Significance (0.05 probability level)
Source: Author's Survey, 2024

Factors affecting respondents Households' contribution to dietary

Table 5 depicts the factors affecting household's contribution to dietary requirement in the study area, the table showed 37.5% of the respondents highlighted the challenge of fire disaster, poor transportation & Fulani invasion in their quest for households dietary requirement, 33.3% of the respondents attributed their main challenge to poor transportation network, 12.5% of them mentioned poor transportation network and fire disaster as bottleneck to household dietary requirement, 11.7% of them mentioned poor transportation network and inadequate access to credit as bottleneck to household dietary requirement while 5.0% of the sampled respondents attributed inadequate access to credit as their main challenge to households dietary requirement.

Table 5: Factors affecting respondents Households' contribution to dietary requirement

Constraints	Frequency	Percentage
Poor transportation network	40	33.3%
Inadequate access to credit	6	5.0%
Poor transportation & Fire disaster	15	12.5%
Fire Disaster, poor transportation & Fulani Invasion	45	37.5%
Poor transportation network & inadequate access to credit	14	11.7%
Total	**120**	**100.0%**

Source: Author's Survey, 2024

Discussion

Demographic distribution of the respondents in Kajola LGA

Available NTFPs in the study area were utilized for the purpose of households' dietary requirement across the eleven communities irrespective of demographic differences such as respondents age, gender, family status, academic qualification, households' size, respondents' dietary requirement sources and their monthly income. The result on Age revealed respondents within the Age bracket of 31-40 years were most involved in NTFPs exploitation for households' dietary requirement in the study area. This agrees with the findings of Kabir *et al.,* (2020) on their work titled "Determinants of Food Security among Forest-Based Households in Oyo State, Nigeria" where majority of the respondents were within 31-40 years age bracket. However, the female gender was more involved in NTFPs exploitation for dietary requirement more than their counterpart gender.

Likewise, the married households predominantly utilize NTFPs more for dietary requirement purposes in the study area. This corroborates the findings of Ganiyat *et al.,* (2023) on the work titled "Determinants of the Contribution of Non-Timber Forest Products (NTFPs) to Rural Household Food Security in Kajuru Local Government Area of Kaduna State, Nigeria." where majority of the sampled respondents were married. In the same vein, the respondents' education qualification was moderately large and hence positively influence households' dietary requirement. This agrees with the findings of Ganiyat *et al.,* (2023) on the work titled "Determinants of the Contribution of Non-Timber Forest Products (NTFPs) to Rural Household Food Security in Kajuru Local Government Area of Kaduna State, Nigeria." where majority of the sampled respondents had secondary education qualification.

Similarly, the respondent's household/family size were moderately large and hence positively influenced households'

dietary requirement. This agrees with the findings of Kabir *et al.,* (2020) on their work titled "Determinants of Food Security among Forest-Based Households in Oyo State, Nigeria" where majority of the respondents had not more than five (5) household members.

Distribution of available NTFPs sold by the respondents in Kajola LGA

Similar to our findings on the available NTFPs sold in the study area which includes wild fruits, honey, firewood & charcoal, bushmeat, bush mango and other NTFPs. The findings of Shemnga (2015) on the work titled "Assessment of the Contribution of Non-timber forest products to Household Food Security and Income Around Baga Catchment Forest in Lushoto District, Tanzania" also indicated that their respondents utilized similar NTFPs to supplement their dietary needs as well as for income generation. Meanwhile, the work of Reta *et al.,* (2020) on their work titled "Assessment of Contribution of Non-Timber Forest Products in the Socio-Economic Status of Peoples in Eastern Ethiopia" showed that fodders, firewood, honey and bushmeat were the available and utilized NTFPs by their respondents. In addition, Derebe and Alemu, (2023) findings emphasized that Gum Arabic, Food, Firewood, Medicinal plant, and honey were the five NTFPs usage types that were mostly used by people and found in almost in all countries of the Horn of Africa.

Mean contributions of NTFPs to Households' Income in Kajola LGA

The result of NTFPs consumed and sold by the respondent's household showed more NTFPs were sold rather than consumed. This stood apart from the findings of Shemnga (2015) on the work titled "Assessment of the Contribution of Non-timber forest products to Household Food Security and Income Around Baga Catchment Forest in Lushoto District, Tanzania" where majority of the households consumed significant amount of their NTFPs harvested than the amount sold out.

Lastly, the multiple regression result showed that the demographic characteristics (Age, family status, academic qualification, core occupation and household size) positively influenced the NTFPs contributions to household dietary requirement. This is in line with the findings of Sawadogo (2023).

Factors affecting respondents Households' contribution to dietary requirement

The results of this study clearly showed that the most alarming constraints to households' contribution to dietary requirement are fire disaster, poor transportation & Fulani invasion. The findings of Reta *et al.,* (2020) on their work titled "Assessment of Contribution of Non-Timber Forest Products in the Socio-Economic Status of Peoples in Eastern Ethiopia" corroborated these findings with approximately 30% of their sampled respondents being faced with problem of fire disaster and over-grazing in their quest for development of NTFPs for utilization and commercialization.

CONCLUSION

Demographics characteristics such as (Age, marital status, education qualification, occupation and households' size) positively impacts the contributions of NTFPs to the dietary requirement of rural households in Kajola Local Government Area of Oyo State. Importance should be given to accelerating food production and security at the household level via agricultural support programs and target-oriented supply of improved agricultural inputs/incentives particularly on NTFPs to rural households and farmers on a sustainable basis. In addition, for continuous availability of NTFPs, there is need for a better investment in value addition of NTFPs in large-scale production and on sustainable basis through concerted efforts of all stakeholders involved. Finally, government should provide credit facilities and infrastructures such as roads, farm machineries, storage and processing facilities to ensure that NTFPs food supplies are available in different places at all times.

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