



ASSESSMENT OF ECONOMIC BENEFITS OF NTFPS IN SOUTHERN KADUNA, KADUNA STATE, NIGERIA

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ABSTRACT: Non-Timber Forest Products (NTFPs) serve as alternative sources of food and income to the rural livelihood. This study was conducted to assess economic benefits of Non-Timber Forest Products in Southern Kaduna, Kaduna State. Three local government areas (LGAs) were purposively selected from the study area, from which two villages from each LGAs were proportionally selected making a total of six villages in all. The opinions of one hundred and six (106) participants from the sample area were assessed with the aid of structured questionnaire and secondary data sources. The analytical tools used for the study were descriptive statistics (average, frequency, percentage and tables), gross margin and inferential statistics. Results of socioeconomic characteristics of the participants show that male made up the majority of the respondents (59.4%) involved in NTFPs activities. The market structure observed is more of monopoly. The major NTFPs found in the area are honey, sprout of fan palm and local pea. Honey production was the most lucrative, it recorded the highest income of (₦2512650) which was closely followed by sprout of fan palm (₦ 204500) while the Local pea has the least income. Regression analysis performed on the variables shows that the levels of education and gender have negative impact on their income whereas age, household size and years of experience have positive effect on their income. NTFPs play a crucial role in livelihood sustainability of the people of southern Kaduna. Given the important role plays by NTFPs in the area, the people should be educated on how to sustainably utilise these resources without depleting it for future use

Key word: Non-Timber Forest Products, economic benefit, Southern, Kaduna State

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1. INTRODUCTION

Forests are capable with sound management of producing products and services that are very vital to economic growth and development as well as producing food for the daily living of people. Forest and forest industries contribute to the economy through the production of and trade in wood for energy, sawed wood, panels and papers (John *et al.* 2013). The forests apart from providing timber also provide biological products called non-timber forest products (NTFPs) (John *et al.* 2013). The term Non-Timber Forest Products (NTFPs) covers all tangible products of forest origin, except wood, and includes a wide range, such as rattan, resins, essential oils, latex, nuts, species, fruits (mango, cashew etc), seeds, leaves, bush meat, fish, birds, eggs and honey (Ros-

Tonen *et al.* 1995). NTFPs provide products such as food and medicine to the poor rural population and ensure food security for many families (Hegdeand *et al.* 2000). People living in and around forest areas have collected NTFPs for centuries and depend on them for the local trade that constitutes their livelihoods (Delang *et al.* 2006) NTFPs are also used for cultural and recreational purposes, and offer various opportunities, including cultural maintenance and revival, forest biodiversity support, and rural economic development (Cocksedge 2006).

NTFPs play a very significant role in many developing countries due to the greater population concentration relying directly on the forest. Since the early 1990s, the role of Non-timber Forest Products (NTFPs) for sustainable forest management and

poverty reduction has received increased attention (Sheil and Wunder 2002). NTFPs have three main functions in the household economy of rural communities living in or adjacent to the forest. Firstly, they help to fulfill households' subsistence and consumption needs in terms of e.g. energy and nutrition as well as medical and construction purposes. Secondly, they serve as a safety-net in times of crises (e.g. income shortages from other income sources, e.g. crop failure) and thirdly, some NTFPs provide regular cash income (Angelsen *et al.* 2003). While the extraction of NTFPs is work-intensive and yields comparatively low returns to labour, coevally, it only requires few skills and technology and extraction sites mostly are categorised by open or semi-open access (Angelsen and Wunder 2003). Whether or not a specific NTFP or the land upon which it is located is sustainably managed depends upon a host of ecological, social and economic factors (Uma Shaanker *et al.* 2004). Despite these potential benefits that are offered by the non-timber forest products, it has been widely documented that forest still offers little in terms of opportunities for expanding livelihood options and accumulation of wealth and assets required to reduce livelihood vulnerability (Anorl and Ruiz-Perez 2001).

However, information on the absolute contribution of NTFPs to rural household income is yet to be deduced conclusively. It appears that NTFPs are blindly utilized by the rural household in communities perhaps to achieve some desired effect. Mean while the Kaduna state is endowed with a forest resources. NTFPs collection is among the sources of their livelihood, therefore sustainable utilization of NTFPs could go a long way to solving food security, poverty, and unemployment problem thereby increasing the standard of living of the rural households. To this end, the need to have information on the economic contribution of NTFPs cannot be overemphasized. The study was designed to identify and analyze the potentials utilization and contribution of NTFPs to the livelihood of rural households in Kaduna state.

2. MATERIALS AND METHODS

2.1 Study Area

The State is located between latitudes $9^{\circ} 03^0$ and $11^{\circ} 32^0$ North of the Equator and longitudes $6^{\circ} 05^0$ and $8^{\circ} 38^1$ East of the Greenwich Meridian (Kaduna state development plan, 2014-2018). The wet season (May to October) is very much heavier in the Southern part of the State in places like Kafanchan and Kagoro, which have an average of over 1,524 mm, than in the Northern part like Makarfi and Ikara, which have an average of 1,016mm. The average annual rainfall and humidity are 1,272.5 mm and 56.64%; respectively while the average daily minimum and maximum

temperatures are 15.1 and 35.18 degrees Celsius (Kaduna state development plan, 2014-2018). The state has distinct agro-climatic demarcations giving a comparative advantage to grow wide varieties of crops and fruit trees, forest trees and rear livestock. The state is divided into three (3) zones namely Zone 1 (Northern Zone), Zone 2 (Kaduna Central) and Zone 3 (Southern Kaduna) (Kaduna State Development Plan 2014-2018).

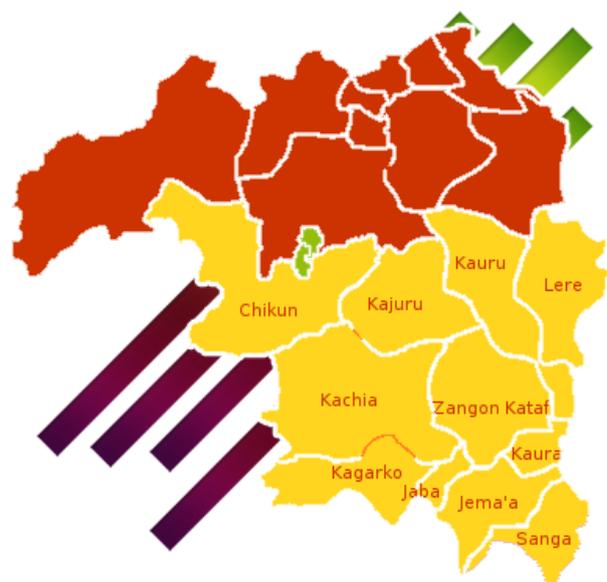


Figure 1:Map of Kaduna State depicting southern Kaduna

2.2 Sampling Technique and Data Collection

The study employed multi stage sampling; the first stage was purposive selection of three (3) local government areas out of the eight (8) in the zone. The LGAs included in the study area were Jama`a, Kaura and Sanga. These Local Government areas selected were in the location of the major forested area; the LGAs selected have 32, 34 and 41 no of villages respectively. The second stage was proportionate sampling two (2) villages from each of the three selected LGAs were selected in the study area. A total of six (6) villages were selected for the study. However, three most common NTFPs (Local pea Sprout of fan palm Honey) used by the respondents in the study area were selected. Last stage was a random selection 30% of NTFPs collectors from the sample frame of each of the six (6) selected villages. The actual population of the NTFPs collectors was not readily available. So, only an estimate of the participants in the study area were obtained during the reconnaissance survey. However, the study adopted that population of parameters from a large sample ($n > 30$) is a satisfactory estimate of the true population (Koutsoyiannis 2003). Hence 30% of the respondents from each village were used. The total sample size used was one hundred and six (106) NTFPs collectors

from all the six (6) villages. Data for the study were collected from primary and secondary sources. Structured questionnaire was used for the collection of data for the study.

2.3 Analytical Tools

Data collected was analyzed using descriptive statistics such as gross margin and inferential statistics (regression analysis). The results were presented using tables, charts, and frequency distribution. Variables used for regression analysis:

$$Y = a + \beta X_1 + \beta X_2 + \beta X_3 + \beta X_4 + \beta X_5 + \beta X_6 + \beta X_7 + \beta X_8 + \beta X_9 + \beta X_{10} + \beta X_{11} + \beta X_{12} + \epsilon \dots \dots (1)$$

Where:

Y_1 = Income from trade in NTFPs in ₦

X_1 = Age in years

X_2 = household size (no of household members)

X_3 = gender (1 if male, 2 if female)

X_4 = Educational dummy variable = 1, if educated, 0 if otherwise

X_5 = Marital status dummy variable = 1 if married; 0 if otherwise

X_6 = Religion = 1 if Islam; 2= Christianity, 0= other wise

X_7 = Do you always have access to the forest (1= yes, 2= no)

X_7 = NTFPs source (Free areas or forest reserves)

X_8 = Major sources of income (₦)

X_9 = Proximity to the source of NTFPs dummy = 1 if close; 0 if otherwise

X_{10} = Years in experience in NTFPs

X_{11} = Seasonality dummy variable = 1 if rainy; 0 if otherwise

X_{12} = Access to market dummy variable = 1 if access; 0 if otherwise

e = error term

Description of explanatory variable in the model

3. RESULTS AND DISCUSSION

3.1 Socio-economic of NTFPs Collectors

Results of the socio-economic characteristics are presented in Table 1 showed that Majority (81%) of participants in the study area are between the ages of 21-50 years, this is alluded in (John, 2013). those with age ≤ 20 were 11% while those with age of 60 years have 8%. On the whole, 81% fall into the economically active age group of 21 – 50 years showing that majority of NTFPs individuals are in the physical active age and household size with average of 4 children were 70.8%; this group has the highest number of responses follow by 16% with Zero (0) number of children, however 13.2% of the participants had family size between 6-10. In some northern of parts of this country their culture and religion encourage early marriage. It will not sound strange or outlandish to people to see that majority of

the participants in this study area were married (Suleiman, 2007). The study identified that 74% are married whereas 22% were single and 10% were widows and widower. Since the dominance of the participants are married. The educational status of the participants in the study area is; those with primary education are 42.5%, secondary school education is 40.6% whereas those with tertiary education are 2.8% and those with other form of education are 14.2%. Life in the study area was more devoted to farming and NTFPs collection activities. 93.4% of the participants stated that farming is their major occupation in the study area more so they also consider it to be their major source of livelihood; whereas 6.6% of them were traders.

Table 1: Distributions of Socio-Economic Characteristics of NTFPs Participants

Variable	Category	Frequency	Percentage (%)
Age	20-29	12	11.30
	30-39	73	68.90
	40-49	8	7.60
	50-59	13	12.25
Minimum	20		
Maximum	57		
Mean	41		
Std deviation	12.791		
Household size	No Response	17	16.0
	1-5	75	70.8
	6-10	14	13.2
	Minimum	1	
Maximum	10		
Mean	6.40		
Std deviation	4.11		
Sex	Male	63	59.4
	Female	43	40.6
	Marital status	Single	22
Marital status	Married	74	69.8
	Others	10	9.4
	Educational Status	Primary	45
Educational Status	Secondary	43	40.6
	Tertiary	3	2.8
	Others	15	14.2
	Major Occupation	Farming	99
Trading		7	6.6
Civil servant		0	0.0
Others		0	0.0
Experience in the collection of NTFPs		1-9	82
	10-19	18	17.0
	20-29	6	5.0
	30-40	0	0.0
Religion	Islam	42	39.6
	Christianity	64	60.4
	Traditional	0	0.0
Proximity (km)	1-4	83	78.3
	5-9	23	21.7
	Monthly Expenditure	5000-10000	30
11000-15000		17	16.0
16000-20000		44	41.5
21000-30000		15	14.2

3.2 Major NTFPS in the Study

The major NTFPs in the study area were found to be honey, Local pea, and sprout of fan palm. The study revealed that honey production has the highest number of participants with (71.7%). This could be because honey was found to be more lucrative among other followed by local pea 15.1% and sprout of fan palm 13.2% though there could be other products that can be more lucrative than the honey (Joel 2007). However, study considered these available resources hence only three products among others were selected (Fig. 2).

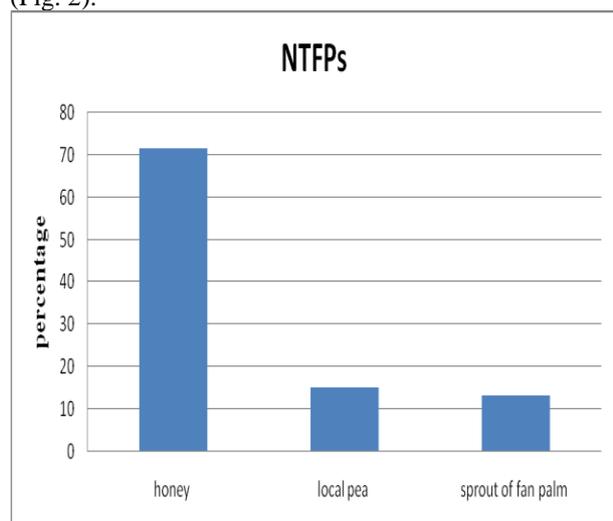


Figure 2: major NTFPs in the study area

Table 2: Gross Margin Analysis for the Major NTFPs in the Study Area

NTFPs Costs/Return (₦)	Local pea(kg)	Sprout of fan palm(kg)	Honey(l)	Total
Total Income	3,10,000	299500	2756500	33660000
Cost of Processing	35,000	7,500	162500	205,000
Cost Marketing/Transportation	52,500	49,000	54,750	156,250
Miscellaneous	18,000	15,750	26,600	60,350
Total Variable Cost(TVC)	105,500	72,250	243,850	421,600
GM (Gross Margin)	204500	227250	2512650	33228400

The Table above shows that the highest income was earned by the honey collectors (₦33228400) which was followed by the sprout of fan palm collectors with ₦227,250 and local pea collectors with ₦204,500. This shows that honey is more lucrative than the other products. Though other places like the villages in Jama`a and Sanga Local Government did not have much interest on the sprout of fan palm and local pea activities.

3.4 Factors Affecting the Contribution of NTFPs to Rural Livelihood

3.3 Gross Margin Analysis

The gross margin of an enterprise is the difference between the total value of production and the variable costs incurred in the production. The gross margin analysis was used to determine the profitability of NTFPs in the study area shown in table.

3.3.1 Monthly income from NTFPs

The study assessed the income of the participants in the study area. However, the study revealed that 15% of the participants earn between ₦10,000 to ₦20,000 monthly 31.1% of the participants earn between ₦21,000 and ₦30,000 monthly, 30% of the participants earn between ₦30,000 to ₦40,000 respectively. Those who earn higher are those that participated more in honey production. Some of the participants revealed that one can get up to ₦37,000 from honey product in one hive that is why most of the participants are engaged in the activities.

3.4.1 Regression Results

The regression analysis was carried out to determine the impact of certain socio-economic variables like the age, sex, educational status, marital status, experience in NTFPs activities, and access to market to sell the collected products, major occupation, and household size. In this study, the most suitable functional form was being determined "analytically" by fitting various functions and selecting the best on the basis statistics criteria.

Table 3: Estimated Regression Coefficient Derived from Semi Log Functional Form for NTFPs in the study Area

Variables	β coefficient	t- ratio	P value
Constant		38.701	0.000
Age (X1)	0.119	1.426	0.158
Gender (X2)	-0.663	-7.220	0.000
Marital status (X3)	0.356	3.661	0.000
Household size (X4)	0.029	0.456	0.649**
Level of Education (X5)	-0.030	-0.405	0.687**
Expenditure from NTFPs (X6)	-0.010	-0.168	0.867**
Years in experience (X7)	0.001	0.018	0.986**
Major occupation (X8)	0.192	-2.247	0.027
Proximity to the source (X9)	-0.096	1.149	0.254
Access to market (X10)	0.022	0.375	0.708**
R ² Value	0.77		
R ² Adjusted	0.74		

** Significant at 5% level

Multiple regression was run to analyse the effect of the above independent (Table 3) variables on the dependent variable (income from NTFPs). The coefficient of multiple determinations R² was found to be 0.77 and R² adjusted was 0.74. This means that 77% of the variation in income was explained by the variables in the model table. The remaining 23% were attributed to errors which rise as a result of some variables not included in the model or some that are not supposed to be included were included in the model. However, from the regression equation, the coefficient having positive signs show that the variables (age, household size, marital status, years in experience, and access to market were found to have direct relationship with gross income. Other factors with negative value such as (gender, expenditure, level of education, and proximity to source) have negative effect on the gross income from NTFPs this agrees with (John *et al.*, 2013). This implies that these variables have effect on their overall efficiency. Despite the effects of the above variable, the findings indicated that rural people are able to generate reasonable amount of income which contributed significantly to their livelihood. Beside the income of the rural people, their food security can also be improved.

4. CONCLUSION

Based on the findings of this study, the following conclusions can be drawn

1. NTFPs collection is done by both male and female of low educational background.
2. Due to lack of government regulation, there is unrestricted access to NTFP collection in the study area.
3. Relevant Government agencies and private organisation should therefore, pay special

attention to NTFP collection for conservation and improvement of the living standard of local community.

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