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## EFFECTS OF FOREST RESOURCES UTILIZATION ON LIVELIHOOD OF RURAL FARMING POPULACE IN KOGI AND NIGER STATES, NIGERIA

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### ABSTRACT

The study determined the Effects of Forest Resources Utilization on Livelihood of Rural Farming Populace in Kogi and Niger States, Nigeria. To achieve the study objectives, 326 farmers were selected using multi-stage sampling technique. Data were collected from primary sources using structured questionnaire complemented with interview schedule. Data were analysed using descriptive statistics (in form of frequencies and percentages) and inferential statistics such as Tobit regression. The hypothesis of the study was tested using spearman correlation coefficient. Findings revealed that the mean age of farming populace was 40.2 years, while the mean experience in forest resources utilization was 18.9 years. Also, 48.2% of respondents had no formal education. Further findings revealed that 50% of the farming populace in the study area were of moderate livelihood status. The coefficient of fuel wood, bags of charcoal, number of timber, number of available herbs and wilds fruits had significant effect on livelihood. The constraints to forest resources utilization in the study area were rapid disappearance of forest resources (5.01) and poor prices of forest resources (5.23), the hypothesis revealed that the coefficient of age (0.1239), education level (-0.1646) and experience in forest resources utilization (0.2342) had significant relationship with livelihood status of farming populace in the study area. It is recommended that government, non-governmental and other agencies should educate farming populace on the benefits embedded in forest resources utilization, farmers should intensify every effort to harness the untapped forest resources that would have positive effect on their livelihood and government and extension agents need to curtail the constraints associated with forest resources utilization.

**Keywords:** Forest resources; Livelihood; Utilization; Farming Populace

### INTRODUCTION

Forest resources are the key components of the natural resource base of any community, region or country and they play a fundamental role in the socio-economic well-

being of the people of those communities (Sheil, 2013). This is prevalent in sub-Saharan Africa, where majority of rural farming families depends on natural forest resources utilization for their livelihood (Amulya, 2014). Nigeria's tropical forest resources are an integral component of the livelihoods of the majority of rural households, and a lower proportion of urban households (Borokini *et al.*, 2010). Apart from meeting the socio-economic needs of rural households for food and shelter, tropical forests are also major sources of both industrial wood products and fuel wood. Fuel-wood and charcoal make up 56% of global wood production and approximately 90% of this is produced in developing countries such as Nigeria. Fuel wood also known as fire wood is the most important source of energy in Nigeria's rural communities (Iorzua, 2010).

Fonta *et al.* (2010) reported that more than 300 million people in the world especially the poor, depend largely on forest gathering for daily subsistence and survival. The potential benefits include: daily subsistence and survival from forest product gathering, income redistribution and poverty reduction, recreational facilities, firewood, timber and medicine. Agarwal (2011) stressed that rural people are highly dependent on forest products for subsistence foods and materials. Over 90% of rural residences rely on forest to meet their family requirements. It was estimated that between 1.095 billion and 1.745 billion people in the world depend on wide range of forests products for their livelihoods and about 200 million indigenous rural communities are almost fully dependent on forests (Chao, 2012).

Olujimi and Adekunle (2015) reported that the average annual value of forest products collected in Nigeria such as fuel wood, construction materials, wild fruits and leaf litter were estimated to be 39% of average gross cash income per year. They stressed further that an estimated charcoal supply across Nigeria earns between 60-80 million Naira per month. According to Anjaneyulu (2005), forest provides food, medicine, timber and many other products. It plays protective roles against soil erosion, drought, floods, and intense radiation. Forest also performs other functions such as recreation and aesthetics centres as well as habitat of diverse wild life. The aim of this study is to determine the effect of forest resources utilization on livelihood of rural farming populace in Kogi and Niger States, Nigeria.

## MATERIALS AND METHODS

### Study Areas

#### Kogi State

The state lies to the south of the Federal Capital Territory, Abuja. The state has two seasons, the wet and dry seasons. The wet season begins in March and ends in October and the dry season spans between November and early March. The annual rainfall is between 1016mm and 1524mm, while the mean daily temperature ranges between 24°C and 27°C. It is located within Longitude 5° 22' and 7° 49' East & Latitude 6° 31' and 8° 44' North. Kogi State has a wide stretch of forest and arable land for farming, good grazing land for livestock and large bodies of water for fishing and irrigation farming. Food and cash crops commonly grown in commercial quantities include yam, cassava, rice, maize, beniseed (sesame) guinea corn, cocoa, coffee, cashew, oil palm and vegetables. The state is located at the confluence of the two largest rivers in West Africa, Rivers Niger and Benue. The state has a total human population of 3,278,487 in 2006 and with a growth rate of 3.2%, the

state has an estimated population of 4,636,071 in 2017, while the land area is about 30,354.74 square kilometres (Kogi State Ministry of Information, 2016).

### Niger State

Niger state is located in the Guinea Savannah ecological zone of Nigeria. In terms of land mass, it is the largest state in Nigeria. It covers a total land area of 74,224km<sup>2</sup> accounting for about eight percent of Nigeria's land area. About 85% of its land area is good for arable crops production (Niger State Geographical Information System, 2015). It is located within Latitudes 8– 10°N and Longitudes 3 – 8°E with a population of about 3,950,249 (NPC, 2006) and with a growth rate of 3.2%, the state has an estimated population of 5,586,000 in 2017 (Niger State Geographical Information System, 2015). Eighty-five percent of the state's populations are farmers. The State is blessed with abundant forest trees and mineral resources such as gold, clay, silica, kyanite, marble, copper, iron, feldspars, lead, columbite, kaolin and tantalite (Niger State Ministry of Information, 2012). Niger state experiences distinct dry and wet seasons with annual rainfall varying from 1,100mm in the Northern part to 1,600mm in the Southern parts. The average annual rainfall is about 1,400mm.

### Sampling Procedure and Sample Size

Multi-stage sampling technique was used to sample respondents for this study. The first stage involved purposive selection of all the Agricultural zones in both States. The second stage involved the random selection of one (1) Local Government from each of the selected agricultural zones. The third stage was random selection of four communities from the selected LGAs. While the fourth stage involved the use of proportionate sampling of 10% of the farmers from the sampling frame of the selected communities.

### Data Collection

Primary data were used for this study. Data were collected on socio-economic characteristics of rural farming populace, livelihood status of farming populace, effect of forest resources on the livelihood of farming populace and factors hindering forest resources utilization by rural farming populace. Data were collected by researchers and trained enumerators using structured questionnaire and interview schedule.

### Data Analysis

Data collected were subjected to descriptive statistics in form of frequencies and percentages. Livelihood status index was computed using the following formula.

$$LSI = \frac{\text{Number of livelihood benefited by } i\text{th respondent}}{\text{Total number of livelihood benefits}}$$

Where:

LSI=livelihood status index  
The categorization is stated below:  
≤ 0.25 = very low livelihood  
0.26-0.49 = low livelihood



0.50-0.75 = moderate livelihood  
 > 0.76 = high livelihood

The implicit and explicit forms of Tobit regression are specified as follows:

$$Y = \alpha + X_1 \beta + \epsilon_i$$

$$Y = a + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 \dots \beta_n X_n$$

Where:

- Y = livelihood status index (LSI)
- X<sub>1</sub> = Income from fuel wood (Naira)
- X<sub>2</sub> = Bags of charcoal sold (Kg)
- X<sub>3</sub> = Number of timber (Naira)
- X<sub>4</sub> = Number of available herbs (Number)
- X<sub>5</sub> = Bunch of wild vegetable sold (Kg)
- X<sub>6</sub> = Income from sales of wild fruit (Naira)

### Kendall's Coefficient of Concordance

The Kendall's coefficient of concordance by Mattson was used to determine factors hindering forest resource utilization by rural farming populace, Kendall's coefficient of concordance determine the severity of the problems i.e a lower mean rank indicates the factors is severe and high mean rank indicates that the factor is not severe.

## RESULTS AND DISCUSSION

### Socioeconomic Characteristics

Result in Table 1 indicated that the mean age of the respondents was 40.2 years. The finding suggests that the respondents belong to the middle age classes, who are physically fit to withstand the stress and rigorous activities involved in the exploitation and utilization of forest resources for their livelihood and are more mentally alert to embrace new techniques that will reduce environmental hazards. This finding agreed with that of Olujide and Oladele (2014) who stressed that agro-forestry practitioners in Oyo State were in their active ages.

Results in Table 1 showed that 83.0% and 78.6% of the respondents in Niger and Kogi States respectively were married. In the same manner, the pooled result revealed that 80.7% of the respondents in the study area were married which is a strong indication of some kinds of family responsibilities that will propel them to seek for alternative source of livelihood from forest resources to augment their incomes.

The result in Table 1 further indicated that majority (73.4% and 58.2%) of the respondents were male in their respective states of Kogi and Niger. On the whole, 66.3% of the respondents in the study area were male. The male dominance over female in the forest exploitation and utilization might be linked to rigorous and tedious stress involved in the forest resource exploitation and utilization. The finding agrees with that of Owonobi (2014) who stated that males are more involved in forest resources exploitation in most part of Nigeria than the female.

Table 1 showed that the mean household size of respondents in Niger State was 11 persons, while that of Kogi State 7 members and the mean of the pooled result was 9 persons. Large household sizes points to the availability of family labour for forest

## Effects of forest resources utilization on livelihood of rural farming populace

resources exploitation and utilization. Conversely, large household size could worsen the livelihood situation of farming populace particularly if they are composed of many dependents. Bola *et al.* (2012) stressed that the large household with no alternative income rely more on forest resources for livelihood.

Table 1: Distribution of farming populace according to socio-economic characteristics

socio-economic characteristics	Kogi State (n=173) Freq (%)	Niger State (n=153) Freq (%)	Pooled (n=326) Freq (%)
Age (year)			
≤20	7 (4.0)	4 (2.6)	11 (3.4)
21-30	42 (24.3)	34 (22.2)	76 (23.3)
31-40	39 (22.5)	35 (22.9)	74 (22.7)
41-50	56 (22.4)	55 (35.9)	111 (34.0)
51-60	24 (13.9)	21 (13.7)	45 (13.8)
>60	5 (2.9)	4 (2.6)	9 (2.8)
Mean	39.8	40.6	40.2
Marital status			
Single	36 (20.8)	18 (11.8)	54 (16.6)
Married	136 (78.6)	127 (83.0)	263 (80.7)
Widow	1 (0.6)	6 (3.9)	7 (2.1)
Separated	-	2 (1.3)	2 (0.6)
Sex			
Male	127 (73.4)	89 (58.2)	216 (66.3)
Female	46 (26.6)	64 (41.8)	110 (33.7)
Household size (number)			
1-5	79 (45.1)	33 (21.6)	112 (34.4)
6-10	74 (42.8)	64 (41.8)	138 (42.3)
11-15	11 (6.4)	28 (18.3)	39 (12.0)
16-20	6 (3.5)	10 (6.5)	16 (4.9)
21-25	1 (0.6)	9 (5.9)	10 (3.1)
>25	2 (1.2)	9 (5.9)	11 (3.4)
Mean	6.7	10.7	8.6
Experience in resources utilization (years)			
1-10	54 (31.2)	33 (21.6)	87 (26.7)
11-20	57 (32.9)	61 (39.9)	118 (36.2)
21-30	46 (26.6)	32 (20.9)	78 (23.9)
31-40	11 (6.4)	20 (13.1)	31 (9.5)
>40	5 (2.9)	7 (4.6)	12 (3.7)
Mean	17.9	20.2	18.9
Educational level (year)			
No-formal education	59 (34.1)	98 (64.1)	157 (48.2)
Primary education	21 (12.1)	30 (19.6)	51 (15.6)
Secondary education	46 (26.6)	13 (8.5)	59 (18.1)
Tertiary education	33 (19.1)	6 (3.9)	39 (12.0)
Adult education	14 (8.1)	6 (3.9)	20 (6.1)

Sources: Field survey, 2018; Figures in parenthesis are percentages

In Table 1 the average years of experience in forest resources exploitation and utilization in both states of Niger and Kogi were 20 and 18 years respectively, while the mean year of experience for the respondents for the pooled result was almost 19 years. The fact that majority of the respondents in the study area started forest products exploitation and utilization long ago and early in their lives signifies that most farmers in the study area earn their livelihood through forest resources exploitation and utilization.

The pooled results in Table 1 revealed that 48.2% of respondents in the study area have non formal education. Only 18.1%, 15.6%, 12.1% and 6.1% had secondary, primary, tertiary and adult education respectively. The implication of this is that those who are literate will be more innovative because of their ability to access information more quickly that will improve their livelihood. In a related study, Ismail (2016) stated that education is an important factor that influenced utilization of forest resources among farmers in Niger State.

### Livelihood Status of Farming Populace

Table 2 presents the distribution of respondents according to livelihood status of farming populace in study the area of which 52.9% and 47.4% of the respondents in Niger and Kogi States were of moderate livelihood status respectively. The pooled result also showed that 50% of the farming populace in the study area were of moderate livelihood status. This finding implies that half of the respondents in the study area were of moderate livelihood status This result is in consorance with the findings of Afeez *et al.* (2016) who revealed that most of the rural women farmers in Oyo State of Nigeria had moderate livelihood.

Table 2: Distribution of respondents according to livelihood status of farming populace

Livelihood status	Kogi State	Niger State	Pooled
	(n=173) Freq (%)	(n=153) Freq (%)	(n=326) Freq (%)
Very low livelihood	7 (4.0)	1 (0.7)	8 (2.5)
Low livelihood	35 (20.2)	2 (1.3)	37 (11.3)
Moderate livelihood	82 (47.4)	81 (52.9)	163 (50.0)
High livelihood	49 (28.3)	69 (45.1)	118 (36.2)

Sources: Field survey, 2018

### Effect of Forest Resources Utilization on Livelihood of Rural Farming Populace

The result of regression analysis in Table 3 showed the effect of forest resources utilization on the livelihood of rural populace in the study area. The result showed Pseudo  $R^2$  of 0.045 and 0.2188 for Niger and Kogi states respectively. While pseudo  $R^2$  of pooled result was 0.628, implying that about 62.8% of variations that occurs in the effect of forest resources utilization on livelihood of respondents were explained by the independent variables included in the model, while the remaining 37.2% were due to external factors not captured by the researcher. The chi-squared statistic 24.03 was significant at 1% level of probability indicating fitness of the model. Fuelwood had negative and significant influence on the effect of forest resources utilization on livelihood in Kogi state and for the pooled

## Effects of forest resources utilization on livelihood of rural farming populace

result, but not significant in Niger State. This suggests that investment in fuel wood business is not remunerative because of inadequate market as a result of alternative gas fossil fuel which is more economical. However, bags of charcoal sold had positive and significant effect on the livelihood in Kogi State and for the pooled result, but insignificant in Niger State, implying that increase in the bag of charcoal sold will increase the income and improved the livelihood status of the farming populace in the study area. Similarly, number of timber sold had positive and significant effect on the livelihood in Niger State but insignificant in Kogi State and pooled result. This is expected because increase in number of bunch of timber sold will increase income of farmers which will consequently improve their livelihood. Also, number of available herbs sold has negative and significant effect on the livelihood in Kogi State but insignificant in Niger State and for pooled result. This result suggests that increase in the number of herbs collected from the forest would not improve livelihood status of farmers. This is likely because of the availability of alternative modern orthodox medicines which are more effective. Moreover, the result revealed that wild fruits had negative and significant influence on livelihood for the pooled result. Thus, increase in wild fruits will reduce livelihood status. This is likely because of the perishable nature of some of the fruits which may affect their marketing and income as well as manner of living of farming families. This finding is in line with study by FAO (2012) who stated that forest resources such as charcoal and timber has direct influence on the livelihood of rural society in Nigeria a case of Osun State were 67% of the rural dwellers depend on the forest resources for their livelihood sustenance.

Table 3: Distribution of respondents according to effect of forest resources utilization on the livelihood of farming populace

Forest resources utilized	Kogi State Coefficient	P-value	Niger State Coefficient	P-value	Pooled Coefficient	P-value
Fuel wood	-0.000163	-2.31**	.0000217	0.26	-.0001415	-3.22***
Bags of charcoal	.0000244	2.03**	.0001055	0.23	.0000192	2.10**
Number of timber	.0002365	0.83	.0000339	3.79***	-.0000383	-1.20
Number of available herbs	-.0235795	-2.75***	.0003002	0.69	.0003457	0.23
Vegetable sold	.0001382	0.40	-2.44e-07	-1.61	.0001535	0.78
Wild fruits	-8.42e-06	-1.40	1.27e-06	0.54	-8.19e-06	-1.95**
Constant	.7416063	32.86***	-.0675225	-3.46***	.8007159	59.79***
Pseudo R <sup>2</sup>	0.2188		0.045		0.628	
Chi <sup>2</sup>	23.74		17.34		24.03	

Sources: Field survey, 2018, Note: \*\*\*= sig at 1%, \*\*=sig at 5%

### Constraint to Forest Resources Utilization

In Table 4 the Kendall's coefficient of 0.24 was significant at 1% level of probability, implying rather a weak agreement among farmers regarding what really was their most serious constraint in forest resources utilization. Rapid disappearance of forest resources (5.01) was ranked 1<sup>st</sup>. This finding agreed with the report of Gurung *et al.* (2013)

who stated that rapid disappearance of forest resources is one of the problems confronting forest in Nepal. This constraint was followed by poor prices of forest resources (5.23). The third ranked constraint was forest use restriction by community (5.29). Other constraints to forest resources utilization in the study area were forest use restriction by government (5.37), Fire outbreak (7.91), Poor financial resources (7.92), Use of crude exploitation tools (8.07) and Poor credit incentives (8.38).

Table 4: Distribution of respondents according constraints face by farming populace

Constraints	Kogi State (n=173)		Niger State (n=153)		Pooled (n=326)	
	Mean ( $\bar{x}$ )	R	Mean ( $\bar{x}$ )	R	Mean ( $\bar{x}$ )	R
Fire outbreak	8.09	6 <sup>th</sup>	7.72	5 <sup>th</sup>	7.91	5 <sup>th</sup>
Poor financial resources	8.02	5 <sup>th</sup>	7.80	7 <sup>th</sup>	7.92	6 <sup>th</sup>
Forest use restriction by government	5.20	4 <sup>th</sup>	5.57	3 <sup>rd</sup>	5.37	4 <sup>th</sup>
Forest use restriction by community	5.07	3 <sup>rd</sup>	5.55	2 <sup>nd</sup>	5.29	3 <sup>rd</sup>
Poor credit incentives	8.23	7 <sup>th</sup>	8.54	8 <sup>th</sup>	8.38	8 <sup>th</sup>
Poor prices of forest resources	4.90	2 <sup>nd</sup>	5.62	4 <sup>th</sup>	5.23	2 <sup>nd</sup>
Use of crude exploitation tools	8.36	8 <sup>th</sup>	7.75	6 <sup>th</sup>	8.07	7 <sup>th</sup>
Rapid disappearance of forest resources	4.88	1 <sup>st</sup>	5.16	1 <sup>st</sup>	5.01	1 <sup>st</sup>
N	173		153		326	
Kendall's W	0.28		0.22		0.24	
Chi-Squared	570.779		403.624		943.358	
Degree	8		8		8	
Asymptotic significant	0.000		0.000		0.000	

Sources: Field survey, 2018 \*Multiple response, Note: R=Ranking

### Relationship between Socioeconomic and Livelihood Status

The result of the correlation in Table 5 showed that there was significant relationship between age, marital status, education, experience in forest resources utilization and livelihood status of respondents. The coefficient of age (0.1239) was positive at 5% probability level which implies that increase in the age of respondent will improve their experience in means of sustenance and livelihood. Also, the education (-0.1646) was negatively significant at 10% level of probability which implies that inadequate educational level will reduce the chances of the farming families to acquire the necessary training and skill in practice of sustainable forest strategies and affect their livelihood. Finally experience in forest resources utilization was positively significant at 1% level of probability, implying that increase in year spent in forest resources utilization will increase the chances of practice of sustainable forest strategies that will control exploitation and deforestation of forest resources in the study area to enhance their livelihood. Therefore, the null hypothesis which stated that there is no significant relationship between some selected

Effects of forest resources utilization on livelihood of rural farming populace  
 socio-economic characteristics of the farmers and livelihood status is rejected and the  
 alternative hypothesis accepted.

Table 5: Relationship between socio-economic characteristics and livelihood status of farming populace

Variables	Kogi State Coefficient	P-value	Niger State Coefficient	P-value	Pooled Coefficient	P-value
Age	0.1494	0.0498**	0.0717	0.3786	0.1239	0.0253**
Education level	-0.0609	0.4298	-0.1802	0.0259**	-0.1646	0.0002***
Experience in forest resources utilization	0.2939	0.0001***	0.0676	0.4063	0.2342	0.0000***

Sources: Field survey, 2018

### CONCLUSION

From the findings of the study, it was concluded that the mean age of the respondents was 40.2 years while 80.7% of farming populace were married. Also, pooled mean of years of experience in forest resources utilization was almost 19 years, 48.2% of respondents had non formal education. Further finding revealed that 50% of the farming populace in the study area were of moderate livelihood status. The coefficient of fuel wood, bags of charcoal, number of timber, number of available herbs and wilds fruits had significant effect on livelihood. The results indicated that rapid disappearance of forest resources 5.01 and poor prices of forest resources 5.23 were the major constraints to forest resources utilization in the study area.

Government, non-governmental and other agencies should educate farming populace on the benefits embedded in forest resources utilization. Farmers should intensify every effort to harness the untapped forest resources that would have positive effect on their livelihood. Government and extension agents need to curtail the constraints associated with forest resources utilization.

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