Influence of Forest Resources Utilization on the Livelihoods of rural farmers in Etche Ethnic Nationality, Rivers State, Nigeria

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Abstract: **The study investigated the influence of forest resources utilization on the livelihoods of rural farmers in Etche ethnic nationality of Rivers State, Nigeria. Descriptive survey design was adopted for the study. The population of the study consisted 786 registered farmers in Etche Ethnic nationality consisting of 584 and 202 registered farmers in Etche and Omuma Local Government areas respectively. Out of which 360 respondents; 270 and 90 from Etche and Omuma respectively were selected as the sample size, through random sampling techniques. Three research questions were answered while one hypothesis was formulated for the study. Data were collected through the administration of self-structured questionnaire which was validated and a reliability coefficient of 0.75 obtained and complimented with interview schedule for the illiterate farmers. Data obtained were analyzed descriptively using mean and standard deviation while regression analysis was used in testing the formulated hypothesis at 0.05 level of significance. It was found from the study that majority of the respondents were female, young and energetic rural farmers who are engaged in collecting and harvesting forest products. Regression analysis showed that there was a significant relationship between the socio economic characteristics of the respondents and utilization of forest resources. Result also showed that most of the forest resources were available for collection and utilization in the study area. The mean responses showed that most of the forest products were utilized in the form of fruits and vegetables, oil, fiber and animals (bush meat).Respondents opined that forest resources would improve their financial security and standard of living among others. Based on the findings, it was recommended that forest based activities should be prioritized by government and other stake holders to enhance the economic and social wellbeing of rural farmers.**

Keywords: **Forest, utilization, livelihood, farmers, rural.**

I. INTRODUCTION

In Africa, it has been estimated that over two thirds of the continent's 600 million people rely on forest products, either in the form of subsistence uses or as cash income derived from a wide range of timber and non-timber forest products (NTFPs), (Kaimowitz 2003; Sunderline,W.D., Angelson,A., Belcher,B., Burger,P., Nasi,R., Santoso,L., Wunder S., 2005).With Forest linked to rural livelihoods, forests present an opportunity for achieving conservation and developmental goals. Forest resources are materials in the forest used by man to satisfy his needs and shape his destiny (Adekola & Mbalisi, 2015). Forest resources are key component of the natural (environmental) resources 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. This is particularly so in Sub-Saharan Africa, where most of the countries have large rural populations that depend on natural resources exploitation for their livelihood.

Apart from meeting the economic needs of rural people for food and shelter, tropical forests are also a major source of industrial wood products and firewood. Firewood is the most important source of energy for developing countries and the only source of energy for most of the world's rural areas (IEA, 2002).

In Sub-Saharan Africa, wood supplies about 70% of total energy used and firewood collectors' account for over 85% of the wood removed from the forest and woodlands (Contreras-Hermosilla, 2000). Furthermore, forest and forest trees are sources of a variety of food that supplement and complement what is obtained from agriculture. The majority of rural households in developing countries and a large proportion of urban household depend on plant product of forests to meet part of their nutritional needs. Forest foods seldom provide the bulk of staple items that people eat; however for rural people, they add variety to diets, improve palatability and provide essential vitamins, minerals, protein and calories.(Bryon and Arnold, 1997).

Many agrarian communities suffer from seasonal food shortages, which commonly occur at the time of the year when stored food supplies have depleted and new crops harvest is just beginning. Forest foods are used extensively at such periods and during emergencies such as floods, famines and droughts. Although, the exploitation of firewood is done primary as a source of energy to the rural households in Nigeria, it has a great deal of effect on their economic wellbeing. This is so because firewood collectors do not gather firewood only for their own domestic use, but for sale in nearby peri-urban and urban areas to generate income. The

significance of forest products income for most families is how it complements other incomes, of the overall household.

In the forest also is a wide array of economic or subsistence materials that come from the forest excluding timber called the Non-Timber Forest Products (NTFP). They range from food or food additives (nuts, mushrooms, wild fruits, herbs, spices, aromatic plants); plant materials (fibers, creepers and flowers): plant derivatives raffia, bamboo, rattan, cork and essential oils); to animals and animal products (honey, silk etc), (Malik, 2000).

The NTFPs play important roles in the livelihoods of millions of rural and urban people across the globe. (Areki & Cunningham, 2010). It is well established that NTFPs fulfill multiple functions in supporting human wellbeing. The NTFPs provide the products for food, medicines, fibres, energy and cultural artifacts for many of the world's poorest people and a considerable proportion of the less poor (Belcher *et al*, 2005, Chauhan *et al.*, 2008).

In Nigeria, rural farmers are the ones directly involved in all farming and forest activities. The most common forms of forest activities are timber extraction and non-timber forest produce (NTFPs) harvesting. Although timber products are highly valued worldwide, the NTFPs play important role in sustaining livelihoods of communities living around forest areas; NTFPs contribute significantly to household income, food security, household healthcare as well as provision of multiple social and cultural values. As indicated by Agrawal *et al.*, (2013), the NTFPs – based activities, if prioritized by the Government and other stakeholders can be used to enhance the economic and social wellbeing of communities living around forest lands.

Zaku *et al.*, (2013) reported that over 70% of the country's households depend directly on fuel wood as their main sources of energy, with daily consumption estimated at 27.5 million kg/day. Thus, harvesting and processing of NTFPs in many areas of the country have shifted from subsistence exploitation and sales at local markets to international cross-boundary trade. For example, in the high forest zones of eastern and Western Nigeria, harvesting of game meat and snails for sales are now major income generating activities almost all year round (Onuche, 2011). While in the savannah zone of central and Northern Nigeria, honey, fuel wood, locust bean seeds, gum and charcoal production generate lots of incomes for the rural households (Jimoh & Haruna 2007).

Etche ethnic nationality is predominantly rural in nature and endowed with forest and its resources. From time immemorial the people depend on its resources, especially the non-timber resources as a livelihood support. Though an agrarian society, the utilization of forest resources seems to be on the increase just as environmental factors seem to be adversely affecting crop production, the primary source of their livelihood. It therefore, becomes imperative to determine the influence of forest resources utilization on the livelihood of rural farmers in Etche ethnic nationality.

The purpose of this study therefore is to investigate the influence of forest resources utilization on the livelihoods of rural farmers in Etche ethnic nationality.

Specifically the objectives are to;

1. Describe the socio-economic characteristics of the rural farmers in Etche ethnic nationality.
2. Identify forest resources available in the study area.
3. Determine the influence of forest resources on the livelihoods of farmers in the study area.

Research Questions

The following research questions guided the study.

1. What are the socio-economic characteristics of farmers in Etche ethnic nationality?
2. What are the forest resources available for use by the farmers in Etche ethnic nationality?
3. What is the influence of forest resources utilization on the livelihoods of farmers in Etche ethnic nationality?

Hypothesis

This formulated null hypothesis was tested at 0.05 level significance

There is no significant relationship between the socio-economic characteristics of rural farmers and their utilization of forest resources in Etche ethnic nationality of Rivers State.

II. METHODOLOGY

The study was conducted in Etche, an ethnic nationality made up of Etche and Omuma Local Government areas in Rives State, Nigeria. Descriptive survey design was adopted for this study. The designed was adopted based on the recommendation of Nwankwo (2016), who noted that descriptive survey is that study in which the researcher collects data from a large sample drawn from a given population and describe certain feature of the samples as they were at the time of the study. The population of the study comprised of 786 registered farmers in Etche ethnic nationality. The choice of Etche was informed by the presence of vast forest lands, the active participation of the people in Agriculture and a record of poverty in the area. As at the time of the study, there were 584 and 202 registered farmers in Etche and Omuma Local Government Areas respectively. (Source: Rivers State Ministry of Agriculture). A sample size of 360 registered farmers (270 and 90 illiterate and literate farmers from Etche and Omuma local Government areas), were used for the study. 20 respondents were randomly selected from 18 communities in the study area giving a total of 360 respondents. The instrument used for data collection was a self-structured questionnaire complimented with interview schedule to elicit responses from the illiterate farmers. The instrument was designed in a pattern of 4-point likert scale of Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD) with assigned numerical values of 4, 3, 2, and 1 respectively and was duly validated and reliability Coefficient (r) of 0.75 established using test-retest.

A total of 360 copies of the instrument were distributed directly to the respondents by the researchers. Completed copies of the instruments retrieved were 340 representing 95% rate of return. This number was considered adequate and used for analysis. Data obtained were analyzed descriptively using means and standard deviation with a criterion mean score of 2.50 as the benchmark for acceptance in respect of research question 2 and 3, frequency and percentage were used in respect of research question 1, while regression analysis was used to test the hypothesis at 0.05 level of significance.

III. RESULTS

Research Question 1

What are the socio economic characteristics of rural dwellers in Etche ethnic nationality?

The following are the socio-economic characteristics of rural farmers in Etche ethnic nationality.

Table 1 A: Socio-Economic Characteristics of Respondents

S/N	Variables	Frequency (360)	Percentage (%)
1	Gender Male	90	25
	Female	270	75
2	Age (years)		
	30-39	72	20
	41-50	152	43
	60 and above	136	37
3	Marital Status		
	Single	42	12
	Married	227	63
	Divorced/separated	22	6
	Widowed	69	19
4	Level of Education Attained		
	No formal Education	93	26
	Vocational Training	53	15
	First School Leaving Certificate	76	21
	Secondary School	86	24
	Tertiary Education	52	14
5	Livelihood Activities		
	Employed	16	4
	Unemployed	43	12
	Self Employed	66	18
	Salaried work		0
	Farming/Gathering/Collection of Forest Products	164	46
	Artisans	10	3
	Trading	43	12
	Mixed	0	0
	Civil Servants	18	5
6	Income Per Month		
	Below poverty Line	216	60
	Low	98	27
	Medium	46	13
	High	0	0

Source 2019 Field Survey

The result in Table 1 A, showed the socio economic characteristics of the respondents. Out of 360 respondents 25% were male while 75% were females. About 43% of the respondents were between the age range of 41-50 years, while 37% were 60 years and above and 63% were married. Majority of the respondents did not have tertiary education, 26% had no formal education, while 14% had tertiary education. The livelihood activities showed that majority (46%) were into farming/gathering and collection of forest products. Only 5% and 18% were civil servant and self-employed respectively. Income per month showed that majority, (60%) were below poverty line, 27% had low income while 13% had medium income per month. None had high income (0%). All the respondents were Christians. The house hold sizes of respondents were basically 5-10 persons (64%). Most of the respondents belonged to village meeting (28%), family meeting (26%) and women meeting (17%).

Test of Hypotheses

Null Hypotheses: There is no significant relationship between the socio economic characteristics of farmers and their utilization of forest resources in Etche ethnic nationality.

Table 1 B: Regression Analysis of Socio-economic Characteristics of Respondents on Utilization of Forest Resources

Items	coff	x-coff	r2	
Gender	-15	0.37	0.719425	Sig
Age	71.55	0.53	0.3224	Ns
Marital status	49.09	0.34	0.3224	Sig
Level of Education attained	65.34	- 0.29	0.2594	Sig
Livelihood	29	- 0.03	0.1614	Ns
Income	54.04	- 0.106	0.2148	Ns
Household	57.43	- 0.105	0.0415	Ns
Membership	39.18	0.049	0.1406	Ns
	526.1952		0.414493	

Source: field survey 2019.

Table 1B, showed that there is significant relationship between gender, marital status, level of education attained and the utilization of forest resources among rural farmers in Etche ethnic nationality of Rivers State.

Research Question 2

What are the forest resources available for use by rural farmers in Etche ethnic nationality?

The following are forest resources available in Etche

Table 2: Forest Resources Available in Etche ethnic nationality

S/N	Items	Available		Not Available	
	1. Timber	Yes	%	No	%
1	Moringa	26	7.22	334	92.77
2	Bush mango tree	20	5.55	340	94.44
3	Mango tree	285	79.16	75	20.83
4	Mohagany	21	5.83	339	94.16
5	Iroko tree	100	27.77	260	72.22
6	Gmelina tree	126	35	234	65
7	Cashew nut tree	8	2.22	352	97.77
8	Teak tree	62	17.22	298	82.77
9	Para rubber tree	17	4.72	343	95.27
10	Logwood	13	3.61	347	96.38
11	Star apple tree	228	63.33	132	36.66
12	African oil bean tree	110	30.55	250	69.44
13	Cotton tree	82	22.77	278	77.22
	2. Non Timber Forest Products Available in Etche ethnic nationality				
	A. Fruits and Vegetable	Yes	%	No	%
14	African star apple	342	95	18	5
15	Bush mango	285	79.16	75	20.83
16	African bread fruit	340	94.44	20	5.55
17	Monkey kola	278	77.22	82	22.77
18	African pear	352	97.77	8	2.22
19	Palm fruits	360	100	0	0
20	Locust bean	24	6.66	336	93.33
21	Plum	216	60	144	40
22	Bitter cola	301	83.61	59	16.38
23	Cashew nut	259	71.94	101	28.05
24	Avocado pear	332	92.22	28	7.77
25	Alligator pepper	308	85.55	52	14.44
26	Mango	360	100	0	0
27	Lickylicky	78	21.66	282	78.33
28	Pawpaw	360	100	0	0
29	Cocoa	18	5	342	95
30	Pepper fruit	281	78.05	79	21.94
31	Bitter leaf	360	100	0	0
32	Scent leaf	360	100	0	0
33	Otazi	328	91.11	32	8.88
34	Uziza	350	97.22	10	2.77
35	Okazi	356	98.88	4	1.11
36	Oha	360	100	0	0
37	Orange	360	100	0	0
38	Green	319	88.61	41	11.38
39	Atama	203	56.38	157	43.61
40	Nkanka	296	82.22	62	17.22
41	Mushroom (Ero)	352	97.77	8	2.22
	B. Oil				
42	Coconut oil	237	65.83	23	6.38
43	Cotton seed	119	33.05	241	66.94
44	Olive plant	18	5	340	94.44
45	oil palm	360	100	0	0
46	Castor plant	10	2.77	350	97.22
47	Soya bean	110	30.55	250	69.44
48	Rose Mary	-	-	360	100
49	Lemon	63	17.5	297	82.5
50	Palm kernel	336	93.33	24	6.66
51	Shea butter	130	36.11	230	63.88
52	Groundnut	332	92	28	7.77
	C. Fibers				
53	Bamboo	167	46.38	193	53.61
54	Raffia	75	20.83	285	79.16
55	palm fruits	302	83.88	58	16.11
56	Kenaf	-	-	360	100
57	Jute	24	6.66	336	93.33
58	Sisal	50	13.88	310	86.1
59	Coconut shell	240	66.66	120	33.33
60	Rattan	116	32.22	244	67.77
61	Pineapple	157	43.61	203	56.38
62	Cotton	10	2.77	350	97.22
	D. Fodder/Forage				
63	Guinea grass	291	80.83	69	19.16
64	Elephant grass	325	90.27	35	9.72
65	Puero	283	78.61	77	21.38
66	Clover	12	3.33	348	96.66
67	Alfalfa	-	-	360	100
68	Amaranthus	323	89.72	37	10.27
69	Stylo	328	91.11	32	8.88
70	Centro (Butterfly pea)	280	77.77	80	22.22
71	Goat weed	350	97.22	10	2.77
72	Sorghum	-	-	360	100
73	Cassava leaf	360	100	0	0
74	Cow pea	82	22.77	278	77.22
75	Soya bean	-	-	360	100

76	Wild mary gold	12	3.33	3.48	96.66
	E. Animals (Bush meat)				
77	Grass cutter	355	98.61	5	1.38
78	Antelope	325	90.27	35	9.72
79	Porcupine	306	85	54	15
80	Squirrels	351	97.5	9	2.5
81	Rabbits	360	100	0	0
82	Leopard	102	28.33	258	71.66
83	Monkeys	86	23.88	274	76.11
84	Crocodile	128	35.55	232	64.44
85	Tortoise	73	20.27	287	79.72
86	Bat	186	51.66	174	48.33
87	Wild pig	271	75.27	89	24.72
88	Hawks	283	78.61	77	21.38
89	Frogs	188	52.22	172	47.77
90	Kite	233	64.72	127	35.27
91	Land snail	360	100	-	-
92	Insects (palm maggot), flight insects, etc.	360	100	-	-

Source: field survey 2019. Range 50% available, less than 50% not available

Table 2:1 showed that among timber forest products surveyed; only items 3 and 11 were available with percentages range of 79.16 and 63.33% respectively. While the remaining items were not available with their percentage less than 50%, the accepted range.

Table 2:2 (A), showed that Non Timber forest products (NTFPs) utilized as fruits and vegetables were readily available for collection and utilization except items 20, 27 and 29 which had acceptance range below 50%, indicating not available.

Among NTFPs utilized as oil and fiber, items 42, 45, 50, 52, 55 and 59 were available with percentages above the acceptance range of 50% as seen in table 2:2 (B and C)

Table 2:2 (D and E) indicated that NTFPs utilized as fodder/forages were available except items 66, 67, 72, 74, 75 and 76 while items 82, 83, 84 and 85 were not available for NTFPs utilized as animals (bush meat).

Research Question 3

What is the influence of forest resources utilization on the livelihoods of farmers in Etche ethnic nationality?

Table 3: Influence of Forest Resources Utilization on the Livelihoods of Farmers

S/N	Items	Omuma (n=90			Etche n = 270		
		Mean	SD	Decision	Mean	SD	Decision
1.	Improved financial security for rural dwellers	2.66	0.23	Agreed	2.53	0.35	Agreed
2.	Improved standard of living for rural dwellers	2.58	0.00	Agreed	2.52	0.23	Agreed
3.	Rural farmers can diversity their source of income	2.33	0.11	Disagreed	2.20	0.35	Disagreed
4.	Rural farmers can become employers of labour	2.80	0.11	Agreed	3.11	0.41	Agreed
5.	Farmers can take financial responsibilities in the community	2.33	0.04	Disagreed	2.11	0.47	Disagree
6.	Farmers will be able to provide for his household	2.66	0.00	Agreed	2.77	0.33	Agreed
7.	Farmers will be able to asses a better health care.	1.66	0.20	Disagreed	2.11	0.23	Disagreed
8.	Farmers can embark on projects for their community	2.00	0.23	Disagreed	2.22	0.23	Disagreed
9.	Farmers can afford a good education for their children	2.13	0.00	Disagree	1.87	0.11	Disagreed
10.	The farmers will be able to take up leadership position	3.33	0.35	Agreed	3.44	0.50	Agreed
11.	They will become financial member of a club or other associations	2.66	0.23	Agreed	2.88	0.95	Agreed
	Grand Total	2.47	0.14		2.52	0.34	

Source: Field Survey 2019

Respondents opined that forest resources would improve their financial security, standard of living and also make them employers of labour as seen in table 3.

IV. DISCUSSION OF FINDINGS

The finding of the study in table 1.A indicated that the respondents were predominantly young, married females with no formal and very low educational status. This is not unexpected because experience shows that farming and its related activities is considered as a vocation for the non-literate or less educated people who reside in rural communities. This observation was further buttressed by the results in table 1.B which showed that significant differences existed between gender, marital status and level of education

attained and the utilization of forest resources among rural farmers in Etche ethnic nationality of Rivers State. This result affirms the assertion of Chilado and Wiersum (2011) who posited that forest resources utilization is a precondition for livelihood of forest communities who do not have alternative sources of income. However, it negates the report of Dishan *et al.,* (2010), who noted that the attainment of high level of education did not constitute a hindrance to non-timber forest products (NTFPs) collection so long as women live in the support zones and enclaves.

The result in table 2:1 showed that Mango and Iroko tree were among the timber forest products significantly available for utilization in the study area. These timber (wood) products are utilized as fire wood for income generation by rural dwellers in the study area. This is in agreement with earlier works by other researchers. IEA, (2002) posited that firewood is the most important source of energy for developing countries and the only source of energy for most of the world's Rural Areas. Ononi, (2009) reported that firewood appeared to be the most utilized forest products by rural dwellers compared to other forest products. He stressed that fire wood is the major source of energy for cooking and heating among rural household and the urban poor in Nigeria.

The analysis of Non timber forest products (NTFPs) in table 2:2 indicated that most of the NTFPs used as fruits and vegetables were available for collection. Among these species were Bush mango, African star apple, African bread fruit, African pear, monkey cola, oil palm, pawpaw coconut. These NTFPs were available to an appreciable extent for consumption by the rural farmers, while some percentages were traded in the local market. This result is in consonance with the report of Salisu (2015) which affirmed that NTFPs were used to augment people's diet and income, the reason for which forest products are maintained. In a similar development, Sunday and Deekor (2019) reported that appreciable percentage of NTFPs; fruits and vegetables were still available for use by rural farmers in Ikwerre ethnic nationality of Rivers State. The findings on oil and fiber showed that among the NTFPs used as oil and fiber, oil palm and coconut were identified to be significantly available for collection and extraction by the respondents. However, others such as cotton seed, olive plant, caster plant, grape, and fruit among others were not available for collection and utilization by respondents. The non-availability could be attributed to deforestation or non-awareness of their uses. This is expected, given the fact that majority of the forested lands have faced serious deforestation as a result of urbanization while some have been converted to secondary forest. This finding agrees with the assertion of Ogundele *et al.,* (2012) who reported that genetic resources of most forest plant species are under immense preserve and that many of them are ecologically threatened, endangered or even extinct in a number of cases. Similarly, Omofonmwan and Osa-Edoh, (2008), noted that Nigeria has lost a total of 8,193,00 ha of her forest between 1990 and 2010. The main cause of this forest loss (deforestation) has been attributed to unsustainable human activities on forest areas, including losing, urbanization and high population. The result of NTFPs used as fodder/forages and animals (bush meat) showed that fodder/forages for feeding domestic animals were identified as being significantly available. Some animals (bush meat) such as Leopard, wild pig among others were not available while grass cutter, squirrel, rabbit, porcupine land snail among others were available in the study area. It thus suggests that small sized animals were the only ones available, hence are the most commonly hunted and consumed wild animals in the study area. Apparently, most of the valuable species of wild animals have gone into extinction as observed from this study. Hence, the most commonly consumed species are the small size animals.

From the result in table 3, it is the opinion of the respondents that forest resources would improve their financial security and also enable them become employers of labour. This is supported by the findings of Olumide (2009) which reported that, in the local, urban, national and international markets, NTFPs contribute substantially to economic growth. He stressed that the Nigerian rural economy is highly dependent on these forest products to generate income and to provide medical care. Similarly, Osemeobo and Ujo (1999) posited that in Nigeria NTFPs is a tried source of wage and nourishment supply and it stays focal in financial prosperity and sustenance of the local populace. Furthermore, respondents also opined that utilizing forest resources will enable them provide for their households, take up leadership position in their community and also become financial member of associations, as unveiled in items 6,10 and 11, table 3. This could be attributed to the fact that income generated from forest products enable the rural dwellers pay their levies in their various clubs or associations and also meet their family economic needs. This observation is in consonance with the report of Pandey *et al* (2011) who posited that majority of rural households in Nigeria and large proportion of urban households depend on the products to meet some part of their nutritional, health, house construction, or other socio-economic needs. In a similar development, Marshal *et al* (2006), also reported that that NTFPs can provide important community needs for improved rural livelihood globally. Adekunle and Bakare (2009) reported that in Nigeria, greater part of rural family units and vast extent of urban families rely upon forest items, (for example, bush meat, nut, seeds and vegetations) to meet part of their dietary needs. Egunjobi (2003) noted that a vast number of family units produce some portion of their income from sales of tree. Onuche (2010) noted that fuel wood is consumed as wood or charcoal to meet the demand for fuel in rural and urban neighborhood as the cost is cheaper compared to that of petroleum products or any other commercial fuel substitute.

V. CONCLUSION

Based on the findings of the study, the following conclusions were made.

Most of the timber products used were mango and iroko tress while NTFPs used as fruits, vegetable, spices and condiments were relatively available for utilization in Etche ethnic nationality, while some fibers, among others were not available which could be attributed to lack of appropriate knowledge on the utilization of forest resources products.

VI. RECOMMENDATIONS

Based on the findings of the study the following recommendations were made.

1. The government at Federal, State, Ministries of forest and environment should regularly organize workshop and seminars for the rural farmers, to update their knowledge on the uses and health benefits of some forest products.
2. Forest based activities should be prioritized by the government and other stake holders to enhance the economic and social well-being of the rural farmers.

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