

ASSESSMENT OF NIGERIA'S RURAL ECONOMY: NEED FOR INCLUSION OF VALUES OF FOREST AND TREE PRODUCTS IN DETERMINING HOUSEHOLD INCOME.

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Abstract

The study investigated the need to include the values of Forest and Tree Products (FTPs), a rural non-farm income in assessing rural household income in Nigeria's rural economy. The purpose was to attract the attention of policy makers and stakeholders that apart from agriculture, there are other sectors of the rural economy that can provide food and income to the rural households. Delta State, Nigeria was the study area. Multi - stage random sampling techniques was used to select 360 rural respondent households used for the study. Agriculture, Agricultural labour and FTPs were the economic activities of the rural household used for the study. Data were gathered from primary sources. The primary data was generated by the use of structured and semi - structured questionnaires, oral interviews and group discussions. Data was analysed with descriptive statistics. Results showed that rural households use a wide range of FTPs both for subsistence and for commercial purposes. Agricultural income was the highest in the study area. This was followed by FTPs income. However FTPs contributed highest in terms of consumption of the rural households. Recommendations include that FTPs just like other food crops and livestock could be properly valued and used to provide good estimates of the rural economy. FTPs income should be separated from Agricultural income or any other rural economic activity during rural household income surveys in order to capture the actual contribution of FTPs income to the rural economy. There is need to replicate this study in a nationwide assessment survey of the values of FTPs. There should be exploration of the value chain of FTPs to help generate more income for the rural households.

Keywords: Rural Economy Forest and Tree Products Valuation Household Income

1.0. Introduction

Income is distributed in the rural areas through farm and non-farm activities. Farm activities include crop and animal husbandry. The non-farm activities include secondary activities based in rural towns and villages such as manufacturing, processing, construction and tertiary activities including transport, trade, finance, and rent services as well as primary off-farm activities like fisheries, hunting, forestry and gathering on common property resources. Apart from income earned from these sources, rural non-farm income (RNFI) also includes earned and unearned income received by rural people from the urban economy (via temporary migration,

remittances, welfare, pensions, and interest) (Department for International Development – DFID - 2004).

The role of agricultural income in the rural areas is not in doubt. Despite its decreased role as component of the Gross Domestic Product (GDP), farm activities in Nigeria continue to employ about 37 percent of the labour force for their livelihood (International Labour Organisation – ILO -, 2018). Ikelegbe and Edokpa (2013) identified agricultural income as the main source of income in a rural economy. Oyakhilomen and Zibah (2014) added that the welfare of the poor in most developing countries is linked closely to agriculture. Most of the poor live in rural areas and they depend on agriculture for their incomes directly in farm activities. However, in recent years, this view has begun to change. There is now a growing recognition that rural households receive income from a diverse portfolio of activities and that one of the most important of these activities is connected with the rural non-farm sector (Madaki and Adefila, 2014). In some cases, the rural non-farm sector is now providing the bulk of income in rural households (Madaki and Adefila, 2014). This study focused on one of such non- farm rural income source, - the Forest and Tree Products (FTPs) and how its values will contribute to accurate assessment of the income of the rural economy.

According to Ahmed(2000), Forest and tree products are products from forest and all other parts or produce of trees and plants including climbers, grasses and creepers. They also include produce from animals when found or brought from a forest. In this study, FTPs are defined as products derived from natural forest, planted forest (including plantations and orchards) and trees outside forest. Trees outside forest include isolated trees in landscape, windbreaks, shelter belts, trees along roads and rivers, trees in agricultural systems and trees in urban environment (Food and Agricultural Organisation – FAO -, 2013a).

FTPs are made up of wood and non-wood products. The wood products are mainly timber, firewood and charcoal. Timber is used mainly as building materials, furniture, matches, utensils, books, newspapers, toilet tissues and fuelwood among others (Ramage, Burrige and Busse-Wicher, 2017). On the other hand non-wood forest products (NWFPs) consist of goods of biological origin (FAO, 2013b). They include fruits, nuts, mushrooms, beverage, wine, clean water, medicinal plants, latex, rubber, gums, and resins, cloth, jute fibers, bast fibers, chewing sticks, tooth cleaners, sponges, decorative

bead, oil, barks, bark and lac, natural varnish, tanning extracts, fodder, honey, bee wax, milk cocoons and forest games(FAO,2013b). For the purpose of this study, the economic and environmental services provided by forest and trees, for example carbon sequestration, soil fertility and soil protection, watershed protection, windbreak uses or general aesthetic and spiritual values are not included.

In Nigeria, timber and pulpwood industries contribute about 8 percent of agriculture's share of Gross Domestic Product – GDP - (Central Bank of Nigeria – CBN - , 2010). This contribution is not the largest contribution of FTPs to the economy as numerous other FTPs and services not accounted for in GDP are of great importance in the daily lives of the majority of Nigerians. The most significant of these is fuelwood, on which most households depend on for cooking. About 50 – 60% of domestic energy supply comes from FTPs in Nigeria (African Institute for Applied Economics – A.I.A.E., 2006; Ajah, 2013 and Zaku, Kabir, Tukur and Jimento, 2013).

FTPs generate substantial cash income for rural people, thereby contributing to their welfare and means of livelihood, and to household budget. Income earned in FTP-based activities contribute most to household food supply directly by providing cash for food purchases or indirectly in agricultural assets or inputs(Suleiman, Wasonga, Mbau, Suleiman and Eihadi, 2017).However an important consideration in the income of rural household is capturing the total income of the household. This can be done through valuation of all the segments through which households receive their income. Total income will help in the accurate assessment of the contributions of the different segments to the income inequalities of the rural economy. Apart from timber, majority of the FTPs are not valued and are not used to calculate the income of the rural households during surveys. The value of FTPs referred to in this study is the economic value. This refers to the contributions FTPs make to human utility and welfare. It is usually quantified as money worth of the FTPs. Valuation apart from revealing the contributions of FTPs to household income will also enable comparisons to be made between the contributions of FTPs and other rural sectors of the economy.

1.1. Problem Statement

Although reviewed literature (Suleiman,et al 2017;Mulenga, Richards, Mapemba, and Tembo, 2018; Izekor, and Amiandamhen, 2017) suggested that FTPs contribute to a wide range of household economic activities, there has been little quantitative work done on total resource use values at the household level. Apart from exploitation of FTPs like timber which is well documented quantified and generally accessible to national statistics and calculations, the Non-timber FTPs which are used by majority of the rural households are usually excluded

from conventional economic household surveys because little is known about their values. How accurate is therefore the economic analysis of rural households if a significant source of economic value has been ignored? Insufficient knowledge also exists concerning the valuation of the contributions of FTPs to the rural economy. There have been no rigorous comprehensive studies on the values of FTPs, their utilizations and the economic determinants of their uses. FTPs costs and benefits are not used for GDP calculations. If GDP is to be a true measure of the aggregate wellbeing of a nation rather than simply recording economic activity, it must be adjusted to take into account non-timber FTPs. Such adjustments will require economic valuation of the FTPs which this study provided. Estimates of the economic values of FTPs can help influence policy and project formulation. It will also help determine which type of economic instrument to use in targeting their production and utilization. These are knowledge gaps that are neglected but are important in policy making in rural economy. This study examined these issues and made useful recommendation.

1.2. Objectives of the Study

The broad objective of the study was to investigate the need to include the values of FTPs in assessing rural household income in Nigeria's rural economy.

The specific objectives include;

1. identifying types of FTPsutilised by rural householdsand FTPs economic characteristics that contributes to rural household income.
2. ascertain the period of availability of the FTPs to rural households;
3. determine the values of the FTPs; and
4. valuation of FTPs contribution to rural household income and consumption

2.0 Methodology

The study area was Delta State, Nigeria. The vegetation of the State ranges from mangrove swamps along the coast to rainforest in the central areas and a "derived savannah" in the northern extremities (grassland, wooded shrub land and immature forest). The State's wide coastal belt is interlaced with numerous rivers, creeks and creeklets while the interland has many perennial rivers and streams which form part of the Niger Delta. The total land area of the State is estimated at 17,698 square kilometres with 1,770 square kilometres of fresh water swamp, 5,840 square kilometers of mangrove swamp and 10,088 square kilometers of rainforest. Apart from agriculture, majority of the rural population were engaged in off-farm, non-agricultural activities which include diverse forms of artisanship, business, employment in both public and private sectors, other forms of wage labour, forestry and tree products (Delta State Ministry of

Agriculture and Natural Resources – DSTMANR - 2001). The State is divided into 3 Agricultural zones with 25 Local Government Areas (LGAs). The 3 Agricultural Zones include Delta North (9 LGAs), Delta Central (8 LGAs) and Delta South (8 LGAs).

2.1. Sample and Sampling Procedure

A multistage sampling procedure was used to select sample for the study. The first stage was the purposive selection of 2 LGAs each from the 3 Agricultural zones giving a total of 6 LGAs used for the study. The 6 LGAs were purposively chosen because they were identified from Delta State Ministry of Environment to have forest resources. The LGAs selected include Oshimili South and Ndokwa East, from Delta North; Ethiope West and Okpe from Delta Central and Patani and Isoko South from Delta South. The second stage was the selection through random sampling 4 villages from each LGA giving a total of 24 villages used for the study. There were a total of 1488 households in the 24 villages selected for the study. The final sample for the study was determined using the equation:

$$n = \frac{N}{1 + N(e^2)} \dots \dots \dots (1) \text{ (Eboh, 2009)}$$

Where n is the sample size

N is the population size

e is the level of precision

With a population size of 1,488 rural households and precision level of $\pm 7\%$ at $P = 0.5$ for maximum variability, the sample size was obtained as follows:

$$n = \frac{1488}{1 + 1488(0.07^2)} = 179$$

This infers that 179 households were adequate for the study. However, in order to be within the sample frame and effectively achieve the objectives of the study, a sample size of 15 rural households were randomly selected from each of the 24 villages giving a total of 360 households used for the study.

2.2. Data Collection

Data were gathered from both primary and secondary sources. The primary data were generated by use of structured and semi-structured questionnaires, oral interviews and group discussions. The structured questionnaire was used to elicit information from rural households on household socio-economic and demographic features, farm, non-farm production activities, extraction and use pattern of FTPs. Other information includes values of FTPs, frequency and intensity of household dependence on FTPs.

The economic activities of the rural households examined by the study were Agriculture, Agricultural labour and FTPs. These economic activities were

selected because they are usually grouped together and categorized as Agriculture during calculations of rural income. The study separated them to find out the contribution of each to rural household income. The semi-structured or open-ended questionnaires which were questionnaire based interviews were constructed to elicit responses from rural households on their sources of income whether from Agriculture; Agricultural labour or FTPs. The semi-structured questionnaire was also used to collect rural household consumption data on these economic activities of the respondent households. The data were collected on daily basis and collated into weeks, months and finally annually. The semi-structured questionnaire was in form of a chart kept to be completed daily by the rural households. Here the rural households recorded their daily earnings, the quantity of products bought for consumption and own consumption, gifts given and received among others. The questionnaires were administered on 360 rural household respondents. 20 household respondents were unable to complete the questionnaire correctly making such questionnaire to be incomplete and invalid. Such questionnaires were discarded and were not used for computations. The remaining 340 household respondents' questionnaires were successfully completed and were used for the analyses. Because of the seasonal availability of some FTPs, this exercise was carried out for a year (October 2016 to September 2017).

Since some FTPs do not have standard values, the questionnaire-based interviews were supplemented by data collected through random weighing of the FTPs from in-situ and ex-situ locations and market places. Data were also collected on market and local prices of FTPs to help arrive at a reasonable average price for the FTPs. The estimates of the quantities of FTPs traded within each local government area was also collected and used for the study. The unit of measure for the FTPs was kilograms and the local currency was the Naira (N).

2.3. Data Analysis

Results were analysed by the use of descriptive statistics of frequency distributions, percentages, and means..'

3.0 Results and Discussions

3.1. Identification of FTPs, their Financial Values and Economic Characteristics

The opinion of respondents on types of FTPs, their period of availability, financial values and economic value were studied. The results of the findings were presented in Table 1.

Table 1. Identification of FTPs, their financial values and economic characteristics

S/N.	Identification of FTPs		Period of Availability		Financial Values		Consumption	Economic Uses		Respondents variables		Rating on Frequency	%
	Common name	Local Name (Igbo)	Season	Peak Period	Unit of Measure	Price N		Durables	Production Input	Asset Formation	Income		
1.	Mango	Mango	Mar – May	April	1kg	75	*			*	335	98.5	
2.	Sour sop		Apr – Aug	June	1kg	143	*			*	327	96.2	
3.	Lime (citrus)	Oromanki lisi	All season	Dec.	1kg	40	*			*	262	77.1	
4.	Sweet orange	Oroma	All season	Dec.	1kg	28	*			*	338	99.4	
5.	Almond tree (umbrella treefruit)	Frutu	Nov – Mar	Jan	1kg	32	*			*	284	83.5	
6.	Guava	Gova	Apr – Jul	June	1kg	54	*			*	320	94.1	
7.	Paw paw	Popo	All season	All season	1kg	86	*			*	331	97.4	
8.	Coconut	Aki oyibo	All season	Nov	1kg	102	*			*	331	97.4	
9.	Palm fruit	Akwu	Dec – Apr	Feb	1kg	200	*			*	328	96.5	
10.	Palm kernel	Aki	All season	Feb	1kg	84	*			*	328	96.5	
11.	Kolanut	Oji	May – Aug	June	1kg	154	*		*	*	279	82.1	
12.	Cocoa	Koko	May – Aug	June	1kg	500	*		*	*	265	77.9	
13.	Cashew fruit Cashew nut	Kachu	Dec – May	Mar Mar	1kg 1kg	334 365	* *			* *	318	93.4	
14.	Avocado pear	Ube oyibo	All season	June	1kg	80	*			*	272	80.0	
15.	Native pear	Ube	May – Aug	June	1kg	100	*			*	338	99.4	

16.	African apple	Udara	Aug Dec – May	Feb	1kg	500	*	*	268	78.8
17.	Ducanut (ogbono) seed Fruit	Ogbono big tree (ukpor)	Jan – Mar	Feb	1kg	1050 150	*	*	325	95.6
18.	Wild mango seed fruit	Ugiri	Apr – June	May	1kg	1050 150	*	*	325	95.6
19.	Bread fruit	Ukwa	Mar – Aug	May	1kg	178	*	*	262	77.05
20.	Wall nut	Ukpa	May – Sept	July	1kg	100	*	*	275	80.9
21.	<i>Vitexdonianu</i>	Mbebe	Mar – Jul	June	1kg	55	*	*	204	60/0
22.	<i>Spondiasmombi n</i>	Ugogo (fruit)	July – Sept	Aug	1kg	42	*	*	204	60.0
23.	Tramarindusind ics	Icheku	Feb – Apr	Mar	1kg	335	*	*	295	86.8
24.	Pepper fruit	Mmimi	May – Sept	July	1kg	1250	*	*	265	77.9
25.	Bitter kola	Akilu	May – Oct	July	1kg	1000	*	*	284	83.5
26.	Alligator pepper	Oseoji	Nov – Apr	Mar	1kg	200	*	*	244	71.8
27.	<i>Xylopiiaaethiopi ca</i>	Uda	Jun – Sept	July	1kg	500	*	*	218	64.1
28.	Hot leaf	Uziza	All season	Jan	1kg	600	*	*	221	65.0
29.	Scent leaf	Aluluisi	All season	All season	1kg	100	*	*	265	77.9
30.	<i>Grongronemala tifolia</i>	Utazi	All season	July	1kg	500	*	*	262	77.05
31.	<i>Brachystegiaeu rycoma</i>	Achi	Oct – Dec.	Nov	1kg	900	*	*	244	71.8
32.	Curry leaf	Cury	All season	All season	1kg	180	*	*	234	68.8
33.	Salad leaf	Okazi	All season	All season	1kg	1500	*	*	260	76.5
34.	Locust bean	Ogiri	Jan –	March	1kg	257	*	*	278	81.8

35.	Oil bean	Ukpaka	Mar Sept – Dec	Oct	1kg	200	*		*	223	65.6
36.	Palm wine	Mmanyankwu	All season	All season	1ltr	120	*		*	328	96.5
37.	Raphia palm wine	Mmanyangwo	All season	All season	1ltr	140	*		*	314	
38.	Palm oil	Ofiigbo/ mmanunni	All season	Dec	1ltr	153	*	*	*	332	92.4
39.	Kernel oil	Mmanuaku	All season	Dec	1ltr	400	*	*	*	301	88.5
40.	Local gin	Ogogoro	All season	All season	1ltr	150	*		*	262	77.1
41.	Mushroom	Elo	All season	All season	1kg	1000	*		*	207	60.9
42.	Water leaf	Mgborogi	Apr – Jun	May	1kg	90	*		*	260	76.5
43.	Bitter leaf	Onugbu	All season	All season	1kg	20	*		*	321	94.4
44.	<i>Pterocarpussp</i>	Oha	Nov – Jan	Dec	1kg	300	*		*	198	58.2
45.	Wild medicine	Ogwuigbo	All season	All season			*		*	278	81.8
46.	Moringa	Alomakwu	All season	All season	1kg	1800	*		*	93	27.4
47.	Tooth pick	Nfaeze	All season	All season	1kg	600		*	*	263	77.4
48.	Chewing stick	Atu	All season	All season	1kg	1500	*		*	321	94.4
49.	Firewood	Nkwu	All season	All season	1kg	15	*	*	*	340	100.0
50.	Charcoal	Unyi	All season	All season	1kg	29	*	*	*	295	86.8
51.	Hand fan	Akupe	All season	All season	1(0.14kg)	30			*	198	27.4

52.	Axe handle	Isi anyike	All season	All season	1(0.5kg)	400			*	243	71.5
53.	Mortar	Odo	All season	All season	1(8kg)	3000			*	260	76.5
54.	Pestle	Aka odo	All season	All season	1(2kg)	800			*	260	76.5
55.	Hoe handle	Isi agwe	All season	All season	1(0.2kg)	300	*		*	292	85.9
56.	Fishing rod	Osisiuk po	All season	All season	1(0.4kg)	100	*	*	*	223	65.6
57.	Canoe	Ugbo	All season	All season	1(250kg)	25000	*	*	*	218	64.1
58.	Paddle	Amala	All season	All season	1(2.2kg)	1500	*	*	*	218	64.1
59.	Harvesting pole	Ngwu	All season	All season	1(1.4kg)	800	*	*	*	255	75.0
60.	Stake	Aruru	All season	July	1kg	40			*	318	93.5
61.	Thatching bundle	Akanya	All season	July	1(4kg)	500	*		*	108	31.8
62.	Jute	All season	All season	All season	1kg	350			*	224	65.9
63.	Broom	Aziza	All season	All season	1kg	250	*		*	340	100.0
64.	Basket	Nkata	All season	All season	1(0.57kg)	150	*	*		312	91.8
65.	Pot	Ite	All season	All season	1.6kg	1000	*	*	*	98	28.8
66.	Mat	Ute	All season	All season	1 roll (1.4kg)	350	*	*	*	198	58.2
67.	Bag (Jute)	Akpa	All season	All season	1(0.4kg)	800	*	*	*	108	31.8
68.	Rope	Elili	All season	All season	1 roll (1.2kg)	300		*	*	279	82.1
69.	Wrapping leaf	Akwuk wouma	Dec – June	Feb	1kg	111		*	*	108	31.8

70.	Cane	Ekwe	All season	All season	1kg	280		*		*	224	65.9
71.	Sponge	Asisa/o gbo	All season	All season	1kg	600	*	*	*	*	198	58.2
72.	Bamboo	Otosi (small)	All season	All season	1kg	10		*		*	305	89.7
		Otosi (big)	All season	All season	1kg	50						
73.	Gourde	Akpa	All season	All season	1kg	20						
74.	Rubber pana	Roba	All season	December	1kg	170		*		*	287	84.4
75.	Wild fish (cat fish)	Atuma	All season	All season	1kg	800	*			*	340	100.00
	dog fish)	Asa	All season	All season	1kg	2000						
76.	Crab	Nshiko	All season	September	1kg	600					302	88.8
77.	Prawn	Isha (okpo)	All season	September	1kg	1800	*			*	302	88.8
78.	Cray fish	Igwilig wu	All season	September	1kg	1000						
79.	Snail	Ejuna	All season	July	1kg	850	*			*	319	93.8
80.	Insect (termite)	Aku	Seasonal	April	1kg	200	*			*	178	52.3
81.	Flying bird	Nnunu (Asha)	All season	All season	1(3kg)	800	*			*	201	59.1
82.	Wild fowl	Okwukwuofia	All season	All season	1kg	800	*			*	198	58.2
83.	Fruit bat	Usuofia	All season	September	1kg	500	*			*	216	63.5
84.	Honey	Nmanuanwu	All season	March	1ltr	600	*		*	*	318	93.5
85.	Bee wax	Ebilibaanwu	Jan – Apr.	March	1kg	150		*		*	318	93.5
86.	Alligator	Ncheanwu	All season	All season	1kg	200	*			*	207	60.9
87.	Grasscutter	Nchi	All season	All season	1kg	1715	*			*	321	94.4

88.	Rabbit	Eyi	season All	All season	1kg	143	*	*	326	95.9
89.	Antelope	Ngbada	season All	All season	1kg	600	*	*	261	76.8
90.	Deer	Ene	season All	All season	1kg	1200	*	*	188	55.3
91.	Squirrel	Osa	season All	All season	1(0.5kg)	200	*	*	243	71.5
92.	Monkey	Monkia	season All	All season	1kg	600	*	*	112	32.9
93.	Snake	Agwo	season All	All season	1kg	1200	*	*	89	26.2
94.	Wild pig	Eziofia	season All	All season	1kg	800	*	*	95	27.9
95.	Edible worm		season All	All season	1kg	3000	*	*		
96.	Crocodile	Aguiyi	season All	All season	1kg	800	*	*	183	53.8
97.	Land crocodile	Oba	season Aug – Dec	October	1kg	400	*	*	188	55.3

FTP used by the rural household for the economic variable

US \$1.00 = Nigerian Naira (N360.00) as at 2017

Table 1 showed analyses of results of objectives 1, 2 and 3 which include identifications of the types of FTPs, their period of availability, financial values and economic characteristics..

On the types of FTPs and their uses by rural households, the study identified 114 FTPs used by rural households. These include a considerable variety of cultivated and wild fruits, wild foods, chewing stick (*Massularia acuminata*), wild medicines (*Azadirachta indica*, *Fagaraxanthozyloides*, *Piper guineensis*, *Crotoloriaretusa*, *Urea picta*, *Azadurectaubduca*), livestock fodder and browse, fertilizers like leaf litters and termiteria and wood products such as firewood, charcoal, construction and building materials, furniture, agricultural implements, cane products, thatches, mats, hats, household utensils, fishing and hunting implements. It should be observed that FTPs were so numerous that the study had to use the commonly utilized types in the study area for analysis. A similar study by Gurung (2006) with NTFPs identified 147 species of NTFPs used by rural households in Manaslu Conservation area, China.

The views of respondents on the economic uses of the FTPs were also given. The economic uses were categorized as consumption, income, durables, production input and asset formation. Results showed that a number of FTPs – foods, fruits, wild medicines and some woods were straight forward consumption goods as can be seen from the high ratings by respondents. Examples are mango, sour sop, palm fruit, coconut, breadfruit (*Treculia africana*), native pear (*Dacrydis eludes*), African apple (*Chrosphyllum albidum*), wild fish, games, soap, chewing sticks, among others. Some FTPs were used as durables such as furniture, bows, building woods, timber, canoes, thatching bundle, pots, rubber, among others. A significant number were used as production inputs. These include cocoa, palm oil, raphia palm (*Raphia vinifera and hookeri*) wine, leaf litter, termitaria, dye, stakes, bamboo, firewood, charcoal, wrapping leaf (*Thaumatococcus danielli*), rubber, honey, fodder and browse, baskets, mats and fishing rods. Lastly, virtually all FTPs used for the study were sold by rural households to generate income.

In addition, the period of availability of these FTPs were also examined. This is mainly in connection with FTPs that were consumed. Results show that three remarkable periods were identifiable. The first was during dry season, between November and April of the following year. The FTPs include mango, orange, palm fruit, cashew, African apple and honey

among others. The second period of availability of these FTPs was when most agricultural crops have been planted but not yet harvested. That is May to August. Such FTPs include sour sop, guava, avocado pear, African pear (native pear), breadfruit, walnut (*Tetracarpidium conophorum*), pepperfruit (*Dennettiatripetako*), bitter kola (*Garcina kola*) and vegetables, among others. Thirdly, there were those FTPs that were available in all season. This category include citrus, pawpaw (*Carica papaya*), coconut, utazi (*Gongronemalatifolia*), oil palm wine, raphia palm wine, local gin, wild fish, moringa, snails, games like grasscutter, rabbit, squirrel, monkey, wild fowl, firewood and charcoal among others.

The financial values of the FTPs were also provided. Although there were different species of most of these FTPs in the study area, the study valued the most common species. Results show that the values of most of the forest products were more expensive than the cultivated tree products and domesticated livestock. For example, 1kg of avocado pear was N80.00 while that of African pear (native pear) was N100.00. 1kg of mango fruit was N75.00 while 1kg of wild mango (*Irvingiagabonensis*) was N150.00. Bitter leaf (*Vernonia amygdalina*) was N20.00 per kg while wild water leaf (*talinum triangulare*) was N90.00 per kg and salad leaf (okazi) (*Gnetum africanum*) was N1,500.00 per kg, mushroom was N1,000.00 per kg. 1kg of sweet orange (*Citrus spp*) was N28.00 while African apple was N500.00 per kg. In the livestock area, 1kg of domesticated pig was N500.00 while 1kg of wild pig was N800.00. 1kg of goat meat was N500.00 while that of a deer was N1, 200.00. 1kg of fish pond cat fish was about N500.00 while 1kg of wild cat fish was N800.00.

3.2. Valuation of FTPs Contribution to Rural Household Income and Consumption

The income and consumption of each economic activity used for the study were valued. The economic activities were limited to Agriculture, Agricultural labour and FTPs. In rural income calculations, these activities were usually grouped together and called Agricultural income (CBN, 2010). However in this study, they were separated to find out the contributions of each sector to the rural household economy.

The study established the contributions of income and consumption from these sources to the total income of the rural households using the 340 rural household respondents selected for the study. The rank of FTPs income and consumption among these economic activities were also determined. Table 2 and Table 3 were used to show the results of the analyses.

Table 2 Contributions of different economic activities to rural household income (n = 340)

S/N	income source	amount Contributed to Total income (N)	mean annual income (N)	percentage (%) contribution to Total Income
1.	FTPs	67,433,096	198,332.64	44.43
2.	Agriculture	78,463,242	230,774.24	51.70
3.	Agricultural labor	5,866,179	17,253.46	3.87
	Total	151,762,517	446,350.34	100

US \$1.00 = Nigerian Naira (N360.00) as at 2017

Result on Table 2 showed that the greatest contributor to rural household total income was Agricultural income with a mean annual income of N230774.64 and ranked 51.70%. This finding met the apriori expectation that the main occupation of the rural households was agriculture (ILO,2018).Agricultural income was followed by FTPs income, 44.43% with a mean annual income of N198332.64.The least contribution of 3.87% came from agricultural labour. This is because labour wages were low in the study area. Giroh,.; Adebayo, and Jongur, (2013) found a man/day farm labour of about 8 hours to be N378.00 in the study area.

Table 3. Contributions of different economic activities to rural household consumption (n=340)

S/N	Economic activity	contribution to total Consumption (N)	mean annual consumption (N)	percentage (%) contribution to Total consumption
1.	FTPs	21,720,828	63,884.7951.95	
2.	Agriculture	17,022,592	50,066.45	40.72
3.	Agricultural labor	3,064,066	9,011.96	7.33
	Total	41807486.00	122,963.2	100.00

US \$1.00 = Nigerian Naira (N360.00) as at 2017

Table 3 showed that the highest contribution to the total consumption of the rural households with mean annual consumption income of N63884.79 (51.95%) was FTPs consumption. This was followed by consumption contribution from Agriculture with a mean annual consumption of N50066.45(40.72%). The least contribution of 7.33% came from Agricultural labour. FTPs being the .highest contributor to total consumption may be due to the fact that apart from the general contribution, FTPs make to rural household food basket; it also helps to bridge the gap during pre-harvest period(Jumbe, ;Bwalya, and Husselman, 2013). Furthermore while Agricultural income is saved for further production, payment of school fees and execution of capital projects, among others, FTPs income were used to purchase subsistence needs and for own consumption (Jumbe et al, 2013).

4.0 Conclusion

The study attempted to create awareness for policy makers and stakeholders that aside agriculture; there are other sectors of the rural economy that could be developed to improve the income of the rural households. One of such sectors which have been extensively discussed in this study was the FTPs. Apart from identifying FTPs, their economic characteristics and their uses, the study attempted to establish, that the values of FTPs could be used to calculate FTPs income contributions to the rural household total income. The result of the valuation of

FTPs further portrayed that FTPs play vital role in the income and consumption of the rural households. Such finding has implication for rural policy in terms of resource use, sustainability, deforestation and poverty alleviation. The study has also showed that income from FTPs if properly harnessed can supplement or provide an alternative to agricultural sector income. In order to strengthen the rural economy, the rural non-farm income sources like the FTPs should be given attention

5.0 Recommendations

- Findings of this study have shown that FTPs play an important role in rural economy. Such avenue cannot be neglected since it will help to portray the true status of rural household budget (income and expenditure) and how to intervene in the rural economy.
- FTPs just like other food crops and livestock should be properly valued and used to provide good estimates of the rural economy. Improvement in the data base of FTPs will aid valuation in this regard.
- FTPs values or income should always be separated from Agricultural income or any other rural economic activity during rural household income surveys. This will help to capture the actual contribution of FTPs income to the rural economy.

- There is need to replicate this study in a nationwide assessment survey of the values of FTPs. This will help establish a platform for integrating its values into national household surveys and ultimately the National Accounting System.
- Exploring the value chain of major FTPs will help improve their production. Value chain analysis will reveal the various products that could be produced and processed from the FTPs, their values and value added at each further step in processing or transformation.

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