Original Research Article

SOCIO ECONOMIC CONTRIBUTIONS OF SOME SELECTED NON TIMBER FOREST PRODUCTS: CASE OF OBAN HILLS FOREST RESERVE, NIGERIA.

ABSTRACT

The study appraised the socio-economic contributions of selected Non-Timber Forest Products (NTFPs) to the people in Oban Hills Group Forest Reserve, Nigeria. The research was carried out from November, 2014 to January, 2015. Data were collected through the administration of structured questionnaires to randomly selected household heads in ten (10) communities from the east and west corridors of the Oban Hills Forest Reserve. Data were analysed using descriptive statistics such as tables, means, simple percentages and graphical illustrations. Inferential analysis was conducted using student's *t-test* and correlation analysis. Results indicate that 68.90 percent of the respondents were male while 31.50 percent were female with 42.10% being farmers. Also 73.60 percent of the respondents were married and mostly in the age brackets of 31-40 years. Result on correlation revealed that there was significant relationship between occupation and household size ($p \leq 0.05$), experience and occupation relate significantly with the income of the respondents at 0.01 and 0.05 level of significant respectively, while marital status relates negatively with household size and experience ($p \leq 0.01$). The study revealed that *Irvingiagabonensis* (Bushmango), *Gnetumafricana* (Afang), *Archachatinaspp* (Snail), and Bushmeat were the major NTFPs harvested from the forest in the study area. On ranking the NTFPs, in relation to income generation and employment, results indicate that Bushmango was the major income generation source, with the highest employment openings in the study area. The people of Oban Hills Group Forest Reserve depend on NTFPs directly and indirectly for income generation and employment, There is need for sustainable harvesting of NTFPs in the study area to enhance their preservation and sustainability in the wild and also proper marketing channels of NTFPs to generate adequate income to improve the living standard of the people in the study area.

1. INTRODUCTION

The term "forest products"is mostly referred to wood and wood-based products.However, they are other pertinent non-wood forest products available in the forests ecosystem known as Non-Timber Forest Products (NTFPs). NTFPs are cultivated and uncultivated constituents of the forest ecosystem existing naturally. They are perceived to have social, cultural and religious significance relevant within the household or for marketing purposes (FAO, 2005). The Nigerians forests have varieties of edibles and non-edibles NTFPs such as fruits, seeds, leaves, nuts, fibres, roots, tubers, resins, latex, bushmeat, sticks, ropes, bamboo and rattan with different economic benefits. These products even though are unequally spread across the rural settings are main sources of income and employment generation. All over the world, over two billion people depends greatly on NTFPs for livelihood security (Vantomme, 2003).

These forest resources can sustain rural livelihood and facilitate rural economic growth in three major ways. Firstly, provision of domestic, subsistence and consumption needs, for increased disposable income to the household (Valeld, 2007; Heubach*et al.,* 2011).Secondly, during economic hardships, they act as insurance premium (Paumgarten&Shackleton, 2009).Thirdly, the sales from these products contribute to financial need of the household (Shackleton&Shackleton, 2009). Many of the rural poor have earned subsistence level of income from harvesting NTFPS and selling them in local and urban markets. Large number of people, mostly the rural dwellers in developing nations, daily gathers these forest products and sell as a means of livelihood (Andel, 2006; Sale, 2006; Shomkegh*et al.*, 2008). These markets have grown rapidly and steadily over the past years (Wilkinson &Elivitch, 2000). NTFPs do not only meet the socio-economic needs of the rural people, but also form anintegral part of their culture and spiritual tradition (World Commission on Forest andSustainable Development, WCFSD, 1997).NTFPs therefore is linked to rural livelihood as the collection, utilization and sales of these products is a prerequisite for survival among community settlement in and around forested areas that may lack alternative sources of income (Chilalo&Wiersum, 2011). In spite of this importance, the economic returns from NTFPs is low, resulting from some key challenges such as unorganized trade, inadequate storage facilities, bad roads and access to market. Hence, many of the NTFPs are now scarce, threatened, endangered and extinct. Factors responsible for this include; under-valuation, population growth, carelessness on the part of managers and utilizers of NTFPs, industrial and urban development, obsoleteness of management plans due to low priority attention by policy- makers because the value of NTFPs is not recognized, hardly publicized and highly debated. All these factors have led to poor understanding of the relevance of these products to the rural economy. This paper therefore attempts to identify and appraised selected NTFPs use for income and employment generation in southern Nigeria

2. MATERIAL AND METHODOS

The research was carried out in ten villages from the east and west of the Oban Hills Forest Reserve. These villages included: Oban, Aking, OsombaAkor, Obung, Neghe, Ekong, Mangor, Nsan and Okarara as shown in Table 1. The villages were purposively selected because the residents have the required knowledge of the issues under study. The Purposive sampling method is a method that is use based on the notion that the population of study possesses the characteristics required for the study (Joshua, 2008). A reconnaissance survey was carried out to obtain preliminary information on the socio-economic aspects of people in the area of study. The households for the study were selected using simple random sampling technique at 20% sampling intensity. The Participatory Rural Appraisal tools was employed, which included the administration of two hundred copies of questionnaires, Focused Group Discussions, visual assessment and interviewing key informants such as NTFPs collectors, gatherers, harvesters, traders, hunters, farmers and forest users as shown in plate 1. The questionnaire was design to capture data on the socio-economic characteristics of the respondents, information on the wild edible and non-edible NTFPs extracted from the reserve for income and employment, the frequency of extraction, the most tradable NTFPs and Man hour spent on harvesting. The PRA tools were employed to give room for the respondents to be actively involved in information gathering. The process also allow the people to state their opinion and such views were captured and used for analysis.

2.1 STUDY AREA

The Oban Hills Group Forest Reserve occupies an area of about 251,345 ha in southern Nigeria (Coates *et al*., 2007). The area lies within Latitudes $5^0 15^{'}$ N and $5^0 25^{'}$ N and Longitudes $8^0 30^{'}$ E and $8^0 45^{'}$ E. In the east, it is bounded by the Korup National Park and Ejagham Forest Reserve in Cameroon as shown in FIG 1. The climate is tropical humid

(Bisong&Mfon, 2006). With temperature ranges from 25^{o}C to 27^{o}C in January, and rises above 30^{o}C by July. In January, the relative humidity is between 75% to 95% but reduces towards the end of the year, resulting to harmattan (Ogar*et al*., 2005; Fa*et al*., 2006; Bisong&Mfon 2006). The annual rainfall in Oban Hills Group Forest Reserve is usually high and decreases to about 3,000mm in the south and 2,500mm in the north from March to November. There is marked dry season between December and February with very few days of rain. The soil is highly susceptible to leaching and erosion.

Oban Hills Group Forest Reserve vegetation is dominated by tropical rainforest at several phases of degradation and recovery. Patches of closed canopy, open canopy, secondary vegetation, farm fallows and oil palm plantations are noticed in the area. The buffer zone is scattered with agricultural activities and farms (oil palm, maize, cocoa, cassava, banana, plantain, and cocoyam farms).

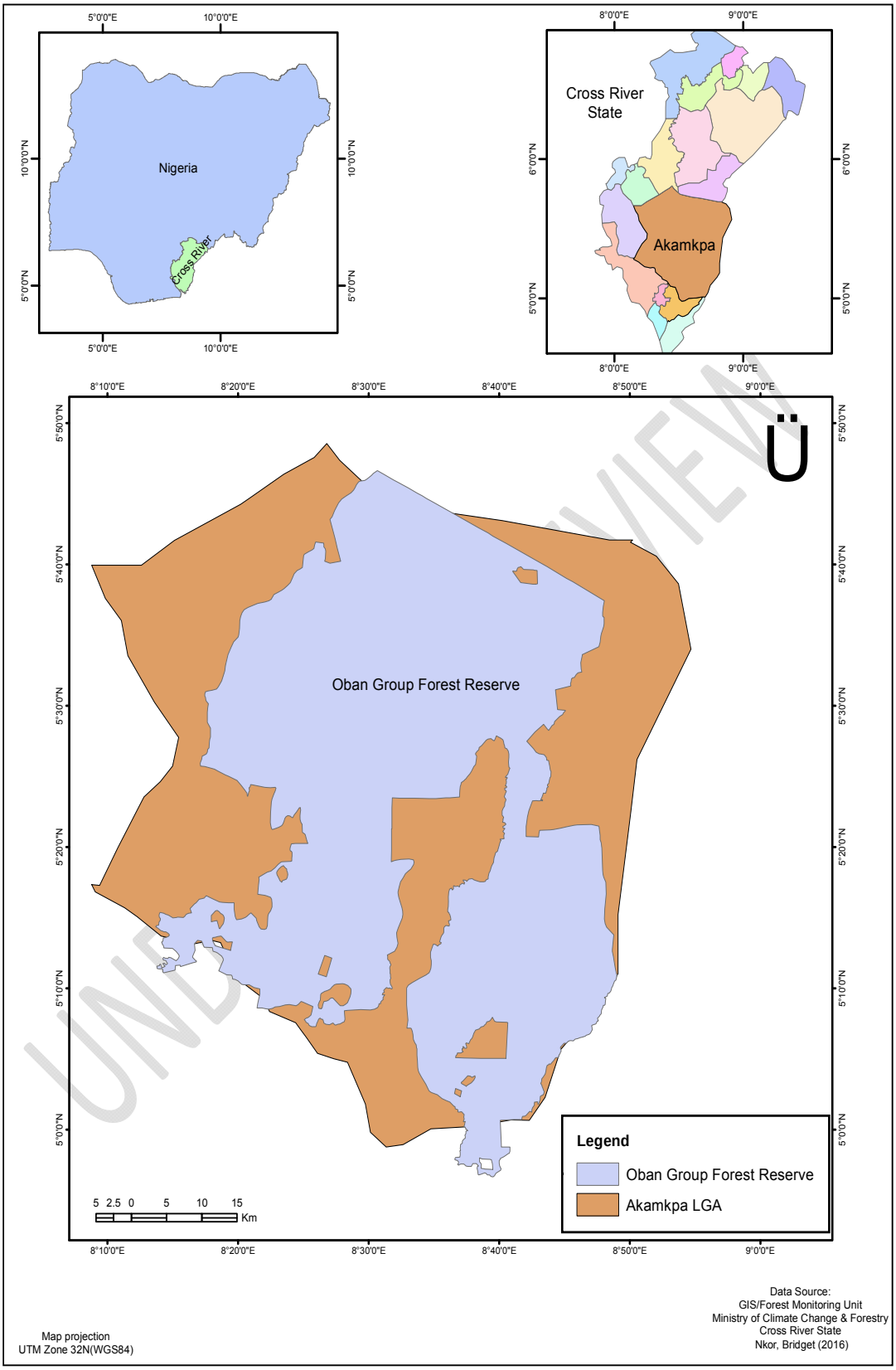

FIG. 1: Map of Akamkpa showing Oban Hills Group Forest Reserve

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Table 1.Population of communities selected for the study

Range	Villages	Male	Female	Total	1991 Population	1996 Projection (3.0%)	2014 projection (3.0%)	Number of households in the study area	Household heads at 20% sampling intensities
OBAN EAST	AKOR	1,111	953	2064	2064	2374	3490	171	34
	0SOMBA	389	321	710	710	815	1193	59	12
	AKING	401	428	829	829	954	1404	69	14
	OBAN	807	767	1,574	1,574	1,809	2655	131	26
	MANGOR	104	95	199	199	229	337	17	3
	EKONG	1028	1026	2054	2054	2364	3480	169	34
	NEGHE	256	234	490	490	565	835	36	7
	OKARARA	362	318	680	680	782	1140	48	10
OBAN WEST	OBUNG	972	938	1910	1910	2197	3221	159	32
	NSAN	922	756	1678	1678	1928	2824	139	28

Source:Adopted and modified from national population commission census result of 1996

2.2 ANALYSIS

Data collected from the field was analysed using descriptive analysis such as tables, means, simple percentages and graphical illustrations. Inferential analysis was conducted using student's *t-test*. Correlation analysis was done to show the relationship between income generated from NTFPs and the socio-economic characteristic of the respondents such as age, household size, marital status, gender, education and occupation

3 RESULTS AND DISCUSSION

3.1 Socio economic characteristics of the respondents

Results on socio-economic characteristics of the respondents as shown in table 2 revealed that 68.1 percent of the respondents were within the age 21-50, while those who were above 50 years constituted 32 percent of the respondents. This showed that NTFPs were extracted mostly by youths that were still active and vibrant in the study area, this agrees with report by Offiong and Ita, (2013), that 89 percent of the respondents in Akamkpa Local Government Area were within the age of 20-50.Results also showed that 73.6 percent of the respondents were married, 26.4 percent were single. This implies that married people were actively involved in NTFPs gathering because of the need to cater for the basic needs of their family members. This finding is alsoagreed with that of Jonah, *et al,* (2013) which noted that 88 percent of the respondents were married while 10 percent were single.Findings revealed that 72.1 percent of the respondents had formal education, while 27.8 percent represent respondents with no formal education. This indicates that majority of the respondents were knowledgeable of the usefulness of NTFPs to household economy, and why it should be harvested sustainably. This finding is in contrast with the views of Offiong and Ita (2013) that 67.5 percent of the respondents in Akamkpa Local Government Area had no formal education. The findings also reveal that respondents were predominantly (44.2 percent) farmers, depending to a large extent on forest products for livelihood. The findings agrees with the views of Olaniyi*et al*, (2013) and Obioha*et al,* (2012) which indicated that farming is the primary occupation of respondents in Iseyin Local Government area in Oyo state and of people in Oban Hills Group Forest Reserve communities.

Table 2.Socio-economic characteristics of respondents

Variables	Frequency	Percentage
Age		
21-30	20	10.2
31-40	64	32.5
41-50	50	25.4
51-60	43	21.8
61-70	17	8.6
71-80	3	1.5
Total	197	100
Marital status		
Married	145	73.6
Single	23	11.7
Separated	29	14.7
Total	197	100
Education		
No formal education	24	12.18
Primary	79	40.10
Secondary	76	38.58
OND	18	9.14
Total	197	100
Primary occupation		
Farming	87	44.2

Fishing	4	2.0
Trader	20	10.2
Artisan	3	1.5
Gathering of NTFP	59	29.9
Timber dealer	13	6.6
Others	8	4.1
Hunting	3	1.5
Total	197	100
Gender		
Male	135	68.5
Female	62	31.5
Total	197	100

Source: Field survey (2015

3.2 NTFPs in Oban Hills Group Forest Reserve Communities

The major NTFPs identified in Oban Hills Group Forest Reserve were: edible nuts, fruits, spices, vegetables, animal protein, mushroom and ropes (Table 3). Each of these products was appreciated for its value in terms of traditional medicine, food, raw material, spices /condiment and for income generation.

Table3.Major NTFPs in Oban Hills Group forest reserve communities

Scientific Name	Common Name	Family	Part Harvested	Part Used	Form of Utilization
	Bushmeat		Flesh	Flesh	Food, Income, Employment
	Firewood		Wood	Wood	Income, Employment
Afromomummeleguata	Alligator pepper	*Zingberaceae*	Fruit	Seeds	Medicine
Apismellifera	Honey bees	*Apidae*	Honey	Honey	Medicine
Archachatinaspp	Snail	*Achatinidae*	Whole part	Fleshly body	Food, Medicine, Employment, Income
Brachystegiaspp	Achi	*Fabaceae*	Fruit	Seeds	Food
Butyrospermumparadorum	Shear butter	*Sapotaceae*	Seed	Oil	Income, Medicine
Calamusacanthospathatus	Canerope	*Palmae*	Rope	Rope	Employment
Cola nitida	Kolanut	*Sterculiaceae*	Fruit	Nut	Employment
Dacryodesedulis	Pear	*Burseraceae*	Fruit	Fruit	Food, income
Garcina kola	Bitter kola	*Clusiaceae*	Fruit	Nut	Medicine
Garcinamannii	Chewing stick	*Rubiaceae*	Stick	Stick	Medicine
Gnetumafricana	Afang*, (Eru)*	*Gnetaceae*	Leaves	Leaves	Food, income, Employment
Gongronemalatifolium	Otasi	*Asclepiadaceae*	Leaves,	Leaves	Medicine
Irvingiagabonensis	Bushmango	*Irvingiaceae*	Fruit	Flesh, seeds	Income, Food, Employment
Labiantheraafricanum	Editan	*Gnetaceae*	Leaves	Leaves	Food, Income, Employment
Pipers guenensis	Hotleaf	*Piperaceae*	Leaves, Seed	Leaves, Seed	Medicine, Income, Employment
Pleurotusostreatus	Mushroom	*Pleurotaceae*	Fleshy body	Fleshly body	Food, income, employment
Raphiahookerri	Raffia palm	*Arecaceae*	Palms	Palms	Income
Ricinodendronheudelotii	Njanga	*Euphorbiaceae*	Seed	Seed	Food (spice)
Tetracarpidiumconophora	Africa Walnut	*Euphorbiaceae*	Fruit	Nut	
Tomatoccusspp	Wrapping leaves		Leaves	Leaves	Food, Income

Source: Field survey (2015)

3.3 Correlation of Socio-Economic Characteristics and Income of respondents

The correlation between socio-economic characteristics of respondents and the income they generate from NTFPs in Table 4 revealed that there was positive relationship between income generation with level of education, occupation and experience with correlation values of 0.140, 0.182 and 0.193 respectively. The findings indicate that mean level of education, occupation and experience influences income generation of the gatherers positively. This

implies that higher level of education will bring about a corresponding increase in the income generated by influencing the decision-making of the respondents in terms of price prediction, harvesting methods, periods, and proper management practices of NTFPs to enhance their sustainability. Occupation also positively related to the income of NTFPs collectors, and is attributed to the time and resources put in to process these forest products before sales.

Age, marital status, household size and gender had negative relationship with income generation. This implies that increase in any of these variables will bring about a corresponding decrease in income generation. This means older married females with larger household sizes will generate lesser income than their male counterparts. Hence, young, single male adults with smaller household sizes would generate more income from sales of NTFPs.

The socio-economics variables that significantly relate with income generation at 5 percent level of significance ($P<0.05$) were occupation and experience. The implication of this result is that, NTFPs collectors' occupation and experience significantly relate with income generation, as these factors influences their decision-making capability.

Table 4.Correlation of socio-economic characteristics and income of respondents

		Age	Marital Status	Household size	Education	Gender	Occupation	Experience	Income
Age	Pearson Correlation	1	-.203**	.586**	-.146*	-.197**	.034	.582**	-.042
	Significance		.004	.000	.041	.006	.639	.000	.560
Marital Status	Pearson Correlation	-.203**	1	-.463**	.009	.266**	-.157*	-.286**	-.036
	Significance	.004		.000	.901	.000	.029	.000	.616
Household size	Pearson Correlation	.586**	-.463**	1	.010	-.054	.151*	.496**	-.047
	Significance	.000	.000		.888	.447	.036	.000	.514
Education	Pearson Correlation	-.146*	.009	.010	1	-.050	.207**	-.104	.140
	Significance	.041	.901	.888		.482	.004	.145	.050
Gender	Pearson Correlation	-.197**	.266**	-.054	-.050	1	.090	-.159*	-.072
	Significance	.006	.000	.447	.482		.213	.026	.318
Occupation	Pearson Correlation	.034	-.157*	.151*	.207**	.090	1	.118	.182*
	Significance	.639	.029	.036	.004	.213		.100	.011
Experience	Pearson Correlation	.582**	-.286**	.496**	-.104	-.159*	.118	1	.193**
	Significance	.000	.000	.000	.145	.026	.100		.007
Income	Pearson Correlation	-.042	-.036	-.047	.140	-.072	.182*	.193**	1
	Significance	.560	.616	.514	.050	.318	.011	.007	

* Correlation is significant at the 0.05 level (2-tailed)

** Correlation is significant at the 0.01 level (2-tailed)

3.4 Ranking and prioritization of NTFPs

The findings reveal that residents of Oban Hills Group Forest Reserve harvested NTFPs for various purposes. The relative importance and values of these products varies among households and individuals but often they are interrelated and complementary. Thus, harvesting of these products is a way of securing their livelihoods by way of income generation and employment. The respondents gave various reasons why they engaged in the collection of NTFPs for income generation and employment. Some gave similar or the same reasons while others gave completely different reasons for which they engaged in the collection. The order of importance of the objectives differed with individual households.

3.5 Contributions of NTFPs to income generation in Oban Hills group forest reserve

The result showed that 16.3 percent of the respondents ranked Bushmango as the highest income generating NTFPs because it is one of the most useful forest fruit tree in the study area. This is because it is a fast growing and early fruiting tropical forest tree, and it produces twice every year, (April and June) andAugust and October). Increase in the commercial value of the seeds has made the product more important and widely accepted to the people of Oban Hills. The finding isin agreement with Dimelu and Odo, (2013) who noted that there is high preference to Bushmango due to its high market value among rural household.

Afangwas ranked the second (15.3 percent) most important NTFPs in the study area. The ranking of Afang as the second income earning product arises from the fact that it is easy to market because of its wide acceptances in both rural and urban areas.

Bushmeat and Snails were the third and fourth household's economy contributors with 13.5 percent and 11.4 percent respectively of the respondents affirming this. This is because the study area is accessible to urban markets and these products are highly sought for by people because of their high protein content.

The fifth (11.2 percent) ranked NTFPs in terms of income generation was honey, this is because of its huge selling potentials and diverse commercial uses, which includes: sweetener in cereals, processed food, and as an ingredient in health and beauty products.

Wrapping leaves, firewood, mushroom, editan and hotleafwere ranked as the least household's income earners because these products are readily available in the forest, so there are gathered from the wild at will by the respondents, therefore, the income realized from the sales of this products was low.

The findings also revealed that 65.7 percent of the respondent reported that NTFPs' collection is a profitable business. This implies that the respondents are into NTFPs collection because the business is profitable. NTFPs' gathering is termed a lucrative business because the benefits outweigh the total cost of production. Hence, the profit will certainly be encouraging to cater for all expenditure incur in the collection process.

In line with this 64.4 percent of the respondents affirms that they will continue gathering NTFPs even when there is alternative source of livelihood, because alternative source of livelihood will not generate enough income to keep the respondents' needs met; therefore, gathering of NTFPs will supplement the income sources of the respondents. The attitude of continuing with the collection of NTFPs even when alternative source of livelihood is available means that, some of the NTFPs cannot be supplemented based on their purposes and usefulness.

Table 5.Ranked NTFPs for income generation in Oban Hill Forest Reserve

Income		
Common Name	Freq	Percent (%)
Bushmango	120	16.3
Afang	112	15.3
Bushmeat	99	13.5
Snail	84	11.4
Honey	82	11.2
Firewood	68	9.3
Wrapping leaves	59	8.0
Mushroom	42	5.7
Editan	40	5.4
Hotleaf	28	3.8

Source: Field survey (2015)

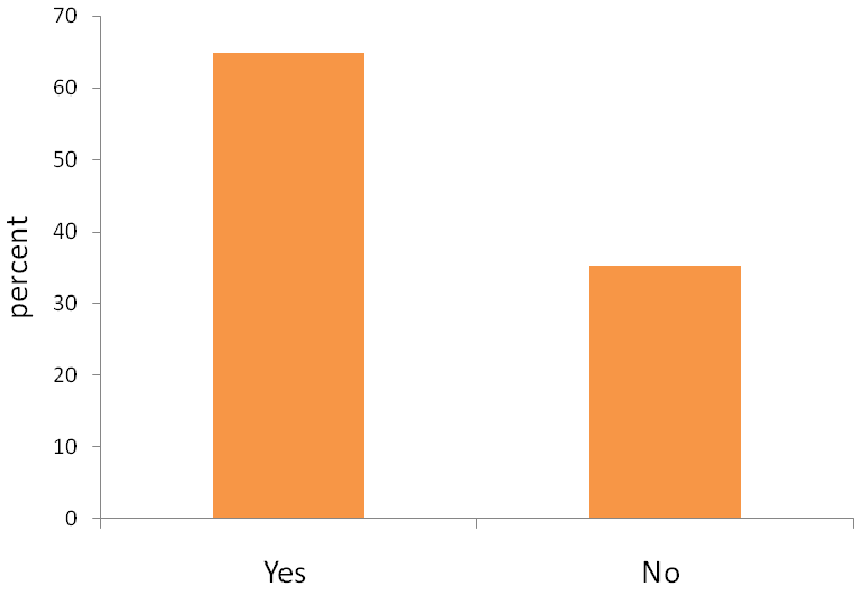

Fig 2: Continuous usage of NTFPs for income generation

3.6 Contributions of NTFPs to employment generation

Result showed that 21.5 percent of the respondents opined that Bushmango was the highest contributor to employment in the study area since, NTFPs collection is carried out during the day and at night by both male and female.

In fact about 208 people were employed in Bushmango business and they spend averagely 468 hours, 208 days in a year to harvest and process this product.

Afang was ranked second (17.7 percent) in the employment scale, as one of the wildly collected NTFPs in the study area. Afang employed averagely 156 of the respondents in a year. The NTFP was harvested by mostly females who spend averagely 364 hours for 156 days per annum. The marketing of afang began mostly from Farm-gate by the whole sellers to urban cities where the demand is high. From the employment scale, 13.6 percent of the respondents ranked snails as the third most valued NTFP in terms of employment. The respondents spend averagely 520 hours for 156 days/annum to gather the product from the forest.

Bushmeat hunting and marketing employed averagely 104 of the respondents a year and was ranked by the respondents as the fourth (10 percent) NTFPs that contributes significantly to employment in the study area. The implication of this is because hunting is a gender sensitive venture in favour of males who stay in the forest for 728 hours, 208 days per annum.

Fuelwood was the fifth (8.6 percent) NTFPs that employed about 104 people a year. This product is mostly gathered by women togather with their children. The extraction of the forest product is done during the day as it found in both farm lands and the forest.

Honey was ranked sixth (7.4 percent) in the employment scale. The majors actors in this business were the men as it employed averagely 104 persons because of the risk involve in harvesting the product.

The NTFPs with least employment openings were Editan, wrapping leaves and hotleaf, which were scored 6, 4.8 and 3.8 percent respectively. This is because there are easy to harvest and the income accrues from the sales of these products is relatively low. Averagely 156 hours is spent in the collections of these products involving 52 persons in a year and women are the major collectors of these forest products (NTFPs).

Table 6: Appraisal of NTFPs for employment in Oban Hills Group Forest Reserve

NTFPs	Frequency	Percent	Average time spend/annum (hrs)	Number of persons /annum	Average number of days/annum
Bushmango	90	21,5	468	208	208
Afang	74	17.7	364	156	156
Snail	70	13.6	520	104	104
Bushmeat	37	10.0	728	104	208
Firewood	30	8.6	364	104	156
Honey	29	7.4	468	104	156
Mushroom	27	6.7	260	104	104
Editan	24	6.0	208	104	104
Wrapping leaves	16	4.8	208	52	104
Hotleaf	16	3.8	156	52	104
Total	460	100			

Source: Field survey (2015)

4 Conclusion

The socio-economic contributions of NTFPs to rural livelihoods in Oban Hills Forest reserve in terms of income and employment generation is astounding. These forest products were freely collected from forest and nearby bushes by mostly youths with sufficient energy to execute the tedious tasks of harvesting them. The study revealed the predominant NTFPs in the area that were major contributors to household's income and employment generation. Ranked top among them was *Irvingiagabonensis* (bushmango) and *Gnetumafricana* (afang), because these forest products have high commercial values and are widely accepted in both rural and urban areas. The study also revealed that NTFPs' collection is a profitable venture in the study area, because the benefits outweigh the total cost of production. Hence, the profit will reasonably cater for the major needs of household members. In view of this I strongly recommend that Proper marketing channels of NTFPs should be created so that rural dwellers can earn adequateincome to improve their livelihood. NTFPs collectors should be trained on how to process, preserve and package NTFPs in order to add value to the products. Finally alternative rural-based Income-Generating Activities (IGRAs), such as cassava processing, poultry, piggery, snail farming, and bee keeping should be encouraged so that the rate of encroachment into forestlands can be reduced.

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