ECONOMIC ANALYSIS OF BUSH MEAT IN IBADAN, OYO STATE.

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ABSTRACT
This study examined the economic analysis of bush meat extraction and marketing as a non timber forest product (NTFD) in Ibadan Oyo State, Nigeria. The data collection was through primary sources with the aid of a well-structured questionnaire administered to 120 respondents in four Local Governments in Ibadan which are Egbeda, Oluyole, Ido and Akinyele Local Governments. The result obtained shows that people within the age range of 31-35years were economically involved most in bush meat extraction and had the highest number in terms of gender.
Also majority of the respondents were married and had NCE/OND and they had the highest number of 35 household which was showed in the chart, between 1 to 5 has the highest range number, also farming has the highest (59%) occupation percentage. The gross margin analysis shows that the trade in the study area was profitable. The Net profits of 1.4 million naira were made in Bush meat selling during the period under consideration. Thirteen constraints were identified and price fluctuation was identified as the major problem and high cost of transportation due to bad road which reduces the income of the respondents.
Keywords: Economic analysis, Bush Meat, Extraction, Marketing.

INTRODUCTION

Non-timber forest products include numerous forest extracts such as bush meat, bark, roots, tubers, leaves, fruits, flowers, seeds, resins, honey, mushrooms, and firewood (Sunderland *et al.*, 2004). They are collected from a wide range of ecosystems such as high forests, farm fallow and farmland, and they are widely used in a variety of ways for subsistence livelihoods, including food, medicine and bartering. Neumann and Hirsch, (2000) define NTFPs as the biological materials (other than industrial round wood and derived from sawn timber, wood chips, wood based panels and pulp) that may be extracted from natural ecosystems and be utilized within the household, be marketed, or have social cultural or religious significance. Jimoh (2006) extended this definition by including ecosystem services such as water purification and prevention of soil erosion. Bush meat is the flesh of wild animals, In Nigeria, wild animals and their by-products are utilized in different ways. A large proportion of the non hazardous animal protein consumed in Nigeria by both rural and urban travelers is derived from the flesh of bush meat (Akegbejo-Samson, 1996). Bush meat is a name for wild animals that are hunted for human consumption. Its supply originates from the forest and the grass lands (Ape Alliance, 1998; Bowen-Jones et al., 2003; brown and Williams, 2003; Okiwelu *et al.* 2009). It is estimated that Nigeria has a striking biodiversity. It is home to gorillas, chimpanzees, baboons, and elephants. The country has 274 mammal species over 20 species of primates 154 reptiles, 53 amphibians, over 20,000 insects' species, 109 snails' species and 899 species of birds (Happold, 2010). For many rural populations, bush meat provides a flexible source of income, a direct source of affordable protein with good storage qualities and safety net in times of particular hardships. In fact bush meat has always been a staple in the diet of rural populations of west and central Africa (Bowen- Jones et al., 2003; Fa ., 2000; Wilkie et al., 2005). Scholars have also shown that bush meat consumption is deeply rooted in cultural preferences and consumers show more willingness to pay for bush meat than domestic meat (Njiforti, 1996; Wilkie *et al.*, 2005). Thus Monney 1994 and Davies, 2002 observed that wild animals are usually superior to domesticated livestock; they make the best use of existing local plants for food and can utilize a wider range of plants. Their conservation and sustainability is therefore an imperative. Animal parts like Gorilla skull, Lion's head, Buffalos' heads, and the skin, feather and furs of animals have been traditionally kept as trophies in many Nigerian communities. The increasing demands on bush meat for income, vitality and cultural needs have therefore made Bush meat trade a strong emerging economic and livelihood activity for both local and urban people. Although in time past, hunting bush meat was primarily for household consumption as source of protein, there is a paradigm shift from subsistence to commercial hunting for income nowadays (Ape Alliance, 1998; Fa 2000; de Merode *et al.* ,2004; Okiwelu *et al.* ,2009).
Studies on bush meat trade are therefore important and fundamental to the development of effective conservation policies and sustainable management of wild animals (Bowen-Jones *et al.* 2003). Such studies will provide the necessary information and entry points in the marketing process, where policy interventions could be targeted to engender sustainable wildlife conservation and hence bush meat trade (Bowen- Jones et al., 2003). However, there is little information from literature about bush

meat trade in Nigeria (Ape Alliance, 1998; Bifarin et al., 2008).

Similarly, Benue state, which is located in central Nigeria within a transitional belt from the high rain forest of southern Nigeria to the savannah lands of the north, has no such information recorded to her credit. This paper explores the instrumentality of bush meat trade to the planning and sustainable management and conservation of wildlife resources in Nigeria**,** based on the observations above, there is need for in-depth study of extraction and marketing of bush meat in Ibadan, Oyo State, Nigeria.

METHODOLOGY

The study was carried out in Ibadan, Oyo State Nigeria, Ibadan is the largest city in West Africa, South of Sahara. It is located in the tropical zone, lying between latitudes 7^0N and 9^0N of the equator and longitudes 3^0E and 5^0E of the Greenwich Meridian. The mean daily maximum rainfall of 1120mm-1140mm is experienced. Data for the study were collected from the primary sources through administration of well-structured questionnaires. The respondents of the study were basically the bush meat sellers in the study areas. The four Local Governments Areas purposively selected were Egbeda, Oluyole, Ido and Akinyele. These local Governments were purposively selected for the study because of high presence of bush meat sellers in and around those areas.

Descriptive statistics were used to analyze the socio-economic characteristics of individuals involved in (gathering, processing and marketing). Cash flow analysis such as gross margin and net return were also employed according to (Anamayi *et al*. 2004)

Gross margin = Total value of production (Revenue) – Variable cost of production

Net Return = Gross Margin – Fixed Cost

The gross margin of an enterprise is the difference between the total value of production and the variable cost of production. The gross margin analysis was used to determine the profitability of Bush meat in the study area.

$GM = GI - TVC$----------(1)

Where GM = Gross margin

GI = Gross income

TVC = Total variable cost

Gini Coefficient analysis

The gini coefficient, as used by Usman *et al*. (2010) was used to determine the inequality in income in the bush meat trade. The gini coefficient is calculated with the formula.

$G = 1 - \Sigma (X_{i}+1 - X_i) (Y_i - Y_i + 1)$----------(2)

Where

X_i = Cummulative percentage of respondents

Y_i = Cummulative percentage of income

Regression analysis.

Multiple Regression Analysis was used to determine the factors affecting the income made from extraction and trade in fuel wood and bush meat in the study area. It was used in accordance with Okerenta (2005), Orebiyi *et al*. (2012) and Usman (2012), Inoni (2010).

The summary variables used in the regression analysis includes

$Y_i = \beta_0 + \beta_1 + \beta_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + ei$----------(3)

Where i = 1, 2, 3, ……. n

Y_i = Income from trade of Bush meat in naira

X_1 = Age in years

X_2 = Household size

X_3 = Cost of collection

X_4 = Transportation cost

X_5 = Educational in years

X_6 = Labour cost

X_7 = Marital status

X_8 = Sex dummy variable = 1 if male; 0 if female.

RESULTS AND DISCUSSION

Socio-economic characteristics of the respondents considered include gender, age, education, marital status, household size primary occupation. Table 1 present the distribution of the respondent's based on their socio economic characteristics. The result indicated that majority of the respondents fall between the age of 31-35 years and (26.7%). Other socio-economic characteristics are presented in Table 1.

Table 1: Socio-Economic Characteristics of Respondents

Variables	Frequency (n=120)	Percentage	Mode	Standard Deviation
Gender				
Male	93	77.5	Male	41933
Female	27	22.5		
Age				
21-25	6	5.0		
26-30	12	10.0		
31-35	32	26.7	31-35	2.0759
36-40	22	18.3		
41-45	20	16.7		
46-50	5	4.2		
51-55	7	5.8		
56-60	10	8.3		
Above 60yrs	6	5.0		
Education				
University graduate /HND holder	8	15		
NCE/OND	42	35	NCE/OND	97748
School Six Certification	24			
Marital Status				
Single	6	5.0		
Married	108	90	Married	3.63037
Widowed	6	5.0		

Fig 1 shows that the highest household size range between 1 to 5 follows by household size of 6 to 10 which was 45% and the household size < than 10 has the lowest percentage of 5%

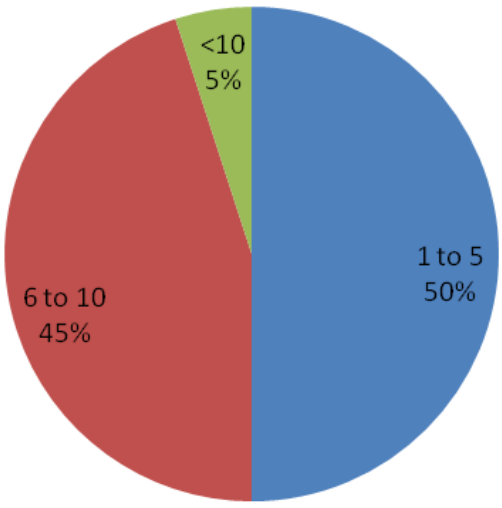

Fig.1: Household size

Costs and Returns of Bush Meat

The gross margin was used to assess the return on bush meat trade among the respondent in the study area which was presented in the table 2 below. The cost of collection and processing of bush meat was ₦145.84 per annum, the total revenue was ₦262,198.60, and Net profit was ₦1529820.16. The return on bush meat extraction was 1.4, indicating that out of every one naira spent on the extraction of bush meat greater net income awaits, the result also showed that there is greater overall benefits in bush meat extraction, the large difference between total revenue and total cost was indication that bush meat extraction is profitable.

Table 2: Average Costs and Return Analysis per Seller per Annum on Bush Meat

ITEMS	AMOUNT (₦)
VARIABLE COST	
Cost of purchase	160,550
Cost of fire wood	2,210
Cost of transport	15,275
Smoking	2,730
Processing	6,630
Labour	3,120
Total variation cost	190, 51
DEPRECIATION ON FIXED COST	
Wheel barrow	62.50
Axe	41.67
Matchet	41.67
Total fixed cost (Depreciation)	145.84
Total cost	190,660.84
RETURNS	
Gross revenue (GR)	262,190.50
Gross profit (GP)	71,529668
Net profit	71529820.16
Return/Naira	1.4

The table examined the profitability function of bush meat production of the respondent, it also identified certain variable such cost of collection, transportation, labour cost gender, age marital status house hold and education, also co-efficient, standard error,t-value and significant. That also that cost of collection significantly influenced the profit of bush meat of the respondents.

Table 3: Profit Function of Bush Meat

Variables	Coefficient	Standard-error	t-value	Significant
Constant	19663.134		1.460	.147
Cost of collection	3.144	.624	7.317	.000
Transportation	2.271	.227	2.310	.223
Labour cost	.321	.003	.349	.728
Gender	1532.034	.030	.385	701
Age	1076.328	.028	-374	709
Marital status	-2038.366	-.065	-.849	.398
Household size	-10034.837	-.330	-4.187	.000
Education	-2216.634	-102	-1.294	.198

R^2 =0.545
Adjusted R^2 =.363

Constraints facing bush meat extraction and marketing

Nine constraints were identified and they are seasonal variation in supply, long distance from the sources, price fluctuation, low demand, rapid spoilage, inadequate credit facilities, storage problem, high cost of input materials, high cost of transportation as shown in table 4.

Among the said constraints price fluctuation was identified to be the major problem, followed by high cost of transportation due to bad road and high cost of input materials such as processing materials and equipments. This findings agreed with (FAO, 2005), which says bush meat product faces the problem of seasonal variation in supply, other are high cost of labour, inadequate credit facilities among others.

Table 4: Constraints facing bush meat extraction and marketing

s/n	Constraints	Major Constraints	Minor Constraints	Not a Constraints		
1	Seasonal variation in supply	24	78		18	C
2	Long distance from the sources	6	72		42	UD
3	Price fluctuation	108	12		24	C
4	Low demand	72	18		6	C
5	Rapid spoilage of the Bush meat	6	66		36	UD
6	Inadequate credit facilities	24	36		6	UD
7	Transportation problem/bad road	18	78		18	C
8	Storage problem	30	54	6	18	C
9	High cost of input materials	6	83		31	C
10	High cost of transportation	6	90	6	18	C
11	High cost labour	6	72	12	30	C
12	Government policy on Bush meat collection	6	66	6	36	UD
13	Problem of land acquisition	12	78	1836	24	C

Source: Field survey 2016

CONCLUSION AND RECOMMENDATIONS

Bush meat is a valuable product that its extraction from the bush must be embraced and encourage in Nigeria and Africa at large in order to increase our protein intake and meet up with the protein recommendations by FAO of 35g of Animal protein per individuals per day. However, certain methods of extraction of bush meat such as bush burning and other illegal means should be discouraged and any individuals engaging in such illicit act should be prosecuted.

Also Government should encourage the Bush meat sellers by providing enabling environment and controlled market for their products and all bad roads in areas where these meat are extracted should be repair and attended to on time without further delay to boost the economics activities in such areas.

REFERENCES

Anamayi, S.E., Okeke E.N. and Usman, J.M.(2004): Profitability Analysis of Semi-Intensive Method of Pig Production in Kaduna Metropolis, Kaduna State., Nigeria. *Tropical Journal of Animmal Science*. Pp.75-79

Ape Alliance, (1998). The African bush meat trade- a recipe for extinction. Fauna and Flora International, Cambridge. 74pp

Bifarin J O., Ajibola, ME., and Fadiyimu, A.A. (2008). Analysis of marketing bush meat in Idanre local government area of Ondo State, Nigeria. African Journal of Agricultural Research 3, 10:667-671.

Davies G, (2002). Bush meat and international development. Conservation Biology. 16: 587- 589.

Happold, D.C.D., (2010). Mammals of Nigeria. New York; Oxford University Press

Inoni, O.E. (2010): Cost and Returns to Artisanal Fishing in Delta State, Nigeria. FAMAN Journal. Vol. 11, No. 1. Pp. 62-70.

Jimoh, S.O. (2006): Sustaining the Roles of Non-Timber Forest Products in Rural Poverty-Reduction and Household Food Security in Nigeria. Journal of Fisheries International 1.2-4: 63-69.

Monney K.A. (1994). Notable notes on giant African snails. Snail farming Research. The Italian Snail farming Association. 5, 7-5

Neumann, R. P., and Hirsch, E. (2000) Commercialisation of Non-timber Forest Products: Review and Analysis of Research. CIFOR, Bogor

Njiforti, HL., (1996). Preferences and present demand for bush meat in northern Cameroon: some implication for wildlife conservation. Environmental conservation 23: 149-155.

Fa, J.E., (2000). Hunted animals in Bioko island, West Africa: sustainability and future in Robinson

Okerenta, S.I. (2005): Evaluation of the Effects of Micro-Finance Programme on the Rural life of Farmers in the Niger-Denta Region, Nigeria. Unpublish Ph.D Thesis. Federal University of Technology, Owerri, Nigeria.

Okiwelu, S.N., N. Ewurum and M.A.E. Noutcha, (2009). Wildlife harvesting and bush meat trade in River State, Nigeria: species composition, seasonal abundance and cost. Scientia Africana 8, 1- 8.

Bowen-Jones, E., Brown, D., and Robinson, E.J.Z. (2003). Economic commodity or environmental crises? An interdisciplinary approach to analysing the bush meat trade in central and West Africa. Area 35. (4) 390-402.

Orebiyi, J.S, Henri-Ukoha, A, Ben-Chendo, N.G., Tasie, C M ., and Ekine, D.I. (2012): Determinants of the Credit Supplied by the International Fund for Agricultural Development (IFAD) to Rural Farmer-Beneficiaroes in Rivers State, Nigeria. International Journal of Agricultural Economics, Management and Development(IJAEMD) Department of Agricultural Economics and Extension, Faculty of Agriculture, Kogi State University, Anyigba, Nigeria. Pp.84-96.

Sunderland, T., Harrison, S and Ndoye, O. (2004) "Commercialisation of non-timber forest products in Africa: history, context and prospects". Forest Products, Livelihoods and Conservation. Case studies of Non-Timber Forest Product Systems. Volume 2 - Africa Eds

Usman J.M., Adeoye, I.B., Adebisi-Adelani, o and Mafimisebi T.E. (2010); Traders Perception of the Structure, Conduct and Performance of the Letuce Market in Ibadan Metropolis. FAMAN Journal. Vol. 11, No. 1. Pp. 27-31.

Usman J.M. (2012): Determinants of Sales Revenue to Telfaria occidentalis Marketing in Ibadan, Nigeria. Journal of Current Opinion in Agriculture 1(1), 31-35.

Wilkie, D. S. Starkey M., Abernethy K, Effa, EN Telfer,P and Godoy, R.(2005). Role of prices and wealth in consumer demand for bush meat in Gabon, Central Africa. Conservation Biology 19.1:268-274.

Monney K. A. (1994). Notable notes on giant African snails. Snail farming Research. The Italian Snail farming Association. 5, 7-5