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*Full Length Research Paper*

# A survey on the economic importance of Bush meat marketing in Nigeria

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**This study was a survey of bush meat marketing in Idanre Local Government Area of Ondo State. The sample consisted of fifty (50) purposely selected bush meat marketers from the study area. Data were collected from respondents through the use of well-structured questionnaire to elicit information on demographic and socio economic variables. The data were analyzed using frequency distribution, percentages, concentration, ratios and operational efficiency. The result revealed that 72% of the respondents sell their bush meat to the final consumers and there was an indication of low concentration in the market given the Concentration Ratio (CR) with $CR_2$, $CR_4$ and $CR_8$ of 0.2, 0.3 and 0.5% respectively. Ninety seven percent had sub optimal operational efficiency which indicates that there is room for efficiency growth. Based on these findings, it was recommended that government should encourage hunters, by reducing areas that are restricted to improve and increase the volume of games catch and also proffer better means of conservation based on informed knowledge of the participants in the trade.**

**Key words**: Bush meat, marketing, operational efficiency.

## INTRODUCTION

Bush meat, the meat of wild animals is one of the most valuable tropical forest products after timber. It is an important source of protein, widely consumed in both rural and urban areas (Wilkie and Carpenter, 1999). The magnitude of its exploitation and consumption however varies from one place to the other and is determined principally by its availability, but this is also influenced by government control on hunting, socio economic status and cultural prohibitions (Asibey, 1977). Bush meat has been part of the local diet for centuries (Grubb et al., 1998) . National estimates of the value of the domestic trade in bush meat range from US$42 to US$205 million across countries in West and Central Africa (Davies, 2002). Ajayi (1979) submitted that a considerable amount of work was done in the 1970s and early 1980s to document bush meat consumption particularly in the South Western area of Nigeria. The data were mostly based on estimates of the number of people who ate bush meat and the contribution of bush meat to national protein supply. For example, it was reported by Ajayi in 1991 that wild animal consumption among rural people in Nigeria's rainforest was 20% of their total animal protein intake compared to the 13% for the whole country. The author further sited that wild animals have higher carbohydrate contents (ranging from 1% in river log to 6% in forest genet) than domesticated as exemplified by 0.8% in pork and 1.3% in mutton. Moreover, the same study reported 16 - 55% protein content in bush meat compared to 11 - 20% for domestic animals. Also, according to money (1994) wild animals are generally superior to domesticated livestock in terms of feed utilization and they make the best use of existing local plants for food and can utilize a wider range of plants than domesticated livestock. Snails for example provide a good source of protein, low in fat and are exceptionally high in iron, calcium and vitamins B. In addition, bush meat is often a

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**Table 1.** Monthly wild life Harvest by licensed Resident hunters in the deciduous and rain forest regions

| BIG GAMES | Deciduous Forest region | | Rain Forest Region | |
|---|---|---|---|---|
| | Number/ Hunter | Kg per hunter | Number/ Hunter | Kg per hunter |
| Duikers (*Cephalopus monticola)* | 3.06 | 20.05 | 2.80 | 18.76 |
| Bush buck (*Tragelaphus scriptus)* | 0.54 | 5.94 | 3.14 | 34.54 |
| Buffalo (*Syncerus caffer)* | 0.00 | 0.00 | 0.14 | 58.80 |
| Est Mon. Harvest/ Hunter | 5.14 | 62.44 | 6.74 | 141.80 |
| Squirrels (*Funiscuirus anerythrus)* | 0.57 | 0.29 | 20.54 | 10.27 |
| Cane rat (*Thryonomys swindesianus)* | 5.40 | 21.60 | 7.94 | 31.76 |
| African gaint rat (*Cricetomys gambienus)* | 7.06 | 14.12 | 10.34 | 20.68 |
| Porcupine (*Hystrix criatata)* | 1.80 | 7.20 | 3.74 | 14.96 |
| Bats*(Eidon heluum)* | 0.00 | 0.00 | 11.20 | 3.36 |
| Est Mon Harvest/ hunter | 15.11 | 43.56 | 59.36 | 88.03 |
| GAME BIRDS | | | | |
| Guinea fowl (*numida meleagris)* | 0.94 | 0.33 | 1.36 | 0.44 |
| Bush fowl*(Francolinus spp)* | 4.34 | 1.52 | 2.94 | 1.03 |
| Et Mon Harvest Hunter | 27.40 | 1.85 | 12.22 | 1.47 |
| Reptiles / mollusks | | | | |
| Monitor Lizard (*Varanus niloticus)* | 0.34 | NA | 3.0 | NA |
| Tortoise *(Kinixus belliana)* | 0.34 | NA | 3.0 | NA |
| Giant snail*(Archachachtina margmata)* | 1.06 | NA | 27.2 | NA |

Estimated monthly harvest per farmer surveyed. Survey from July to November rainy season 2000.
Source: Decker (2003).

good source of minerals and vitamins. The meat is sometimes recom-mended by medical doctors to improve patient's health conditions.

Deckers (2003) estimated the monthly wild life harvest by licensed resident hunters in the deciduous and rain-forest region of Nigeria during the year 2000 rainy season. The study revealed that the animals most commonly harvested in the rain forest region are snails, squirrel, giant rats, guinea fowl, bats, cane rats, porcupine and chicken in that order

Table 1 showed the range of wildlife harvested by category and the kilogram per hunter by ecological region. It further revealed that averagely, per month, the quantity harvested in kilogram per farmer for big games, cane rat and game birds were 141.80, 88.03 and 1.47 respectively for the rain forest as compared to the figures of 62.44, 43.56 and 1.85 for big games, cane rat and game birds in that order. Figures for reptiles/mollusks were however not available because small games were harvested in far greater number by farmers and consumed by the household, than the professional hunters. He estimated the monthly harvest of small animals by farmers in the rain-forest region to be 61 million kilograms as compared to 318 million kilogram for big games.

The bush meat trade is perceived as a major threat to wild animal population in the tropics. There is little information in the literature about the organization of the trade or those involved, thus hindering the development of effective conservation policy (Guy et al., 2004). It is also on record that bush meat extraction in Africa is exceptionally high and west Africa in particular is noted for severe hunting of game animals, leading to extinctions of some animal species (Oates et al., 2001; Brashares et al., 2001) Most previous work has focused on the biological rather than the socio economic aspects of the trade, surprisingly little is known about the structure and performance of the market. This lack of knowledge is a significant obstacle to the conservation management of the bush meat trade because the development of effective management policies requires a comprehensive understanding of how bush meat markets operates (Samantha et al., 2003).

## METHODOLOGY

The study was carried out in Idanre Local Government Area. The local government area was chosen because of the intensity of bush meat marketing activities. The area falls into the tropical rainforest with high humidity. The vegetation and rainfall pattern favour the growth of tropical trees crops such as cocoa and kola nut. There are large expanses of rock in the area which makes Idanre a popular tourist attraction center. The area is also known for commercial timber exploitation. The people inhabiting this area are mostly farmers/hunters and artisans.

Five markets were selected based on intensity of bush meat marketing operations and from each market, 10 marketers were randomly chosen to make a total of fifty respondents. The data were collected through the use of structured questionnaire and it elicited information on socio economic and cost tracing variables.

Descriptive statistics such as frequency distribution and percen-

**Table 2.** Distribution of socio economic characteristics.

| Socio-economic Characteristics | Frequency | Percentage |
|---|---|---|
| **Gender** | | |
| Male | 28 | 56.0 |
| Female | 22 | 44.0 |
| Total | 50 | 100.0 |
| **Age** | | |
| 21 - 30 | 26 | 52.0 |
| 31 - 40 | 18 | 36.0 |
| 41 - 50 | 6 | 12.0 |
| Total | 50 | 100.0 |
| **Marital status** | | |
| Single | 17 | 34.0 |
| Married | 33 | 66.0 |
| Total | 50 | 100.0 |
| **Educational level** | | |
| No formal education | 8 | 16.0 |
| Primary school certificate | 6 | 12.0 |
| Secondary school certificate | 19 | 38.0 |
| Tertiary education | 13 | 26.0 |
| Adult literacy | 4 | 8.0 |
| **Total** | **50** | **100.0** |

**Source:** Field Survey, 2007

**Table 3.** Distribution of respondent marketing experience.

| Marketing experience | Frequency | Percentage % |
|---|---|---|
| Less than 5 years | 26 | 52.0 |
| 6 – 10 | 11 | 22.0 |
| 11 – 20 | 9 | 18.0 |
| 21 and above | 4 | 8.0 |
| Total | 50 | 100.0 |
| **Source of supply** | | |
| Farmer | 6 | 12.0 |
| Hunters | 38 | 76.0 |
| Family | 6 | 12.0 |
| Total | 50 | 100.0 |
| **Price determination Dictated by trade association** | | |
| Previous sales | 1 | 2.4 |
| Weight | 20 | 40.0 |
| Cost of purchase | 9 | 18.0 |
| Margin | 20 | 40.0 |
| Total | 50 | 100.0 |
| **Period of highest supply** | | |
| December - April | 42 | 84.0 |
| May - November | 8 | 16.0 |
| **Total** | **50** | **100.0** |

**Source:** Field Survey, 2007

percentages (%) were used to analyze the data. Inferential statistics used were concentration ratio (CR) and herfindahl index (HI) to measure the structure; operational efficiency to gauge the performance in the market.

(i) Concentration Ratio (CR):

$$CR = \frac{\bar{x}_n}{x_i}$$

$\bar{x}_n$ = Volume of product in Kg (bush meat) handled by n large firms

$x_i$ = Total volume of bush meat within the market

(ii) Herfindahl Index (HI):

$$HI = \sum_{i=1}^{n} \left( \frac{x_i}{T} \right)^2$$

n = number of firms in the industry $x_i$ = absolute size of individual firms T = Total volume of bush meat

(iii) Operational Efficiency (OE): It is defined as

$$OE = \frac{1}{mc_l} \times (mc_L) \times 100$$

Where

$mc_L$ = unit marketing cost of the bush meat marketing firm with the lowest unit cost in the study area

$mc_i$ = Unit marketing cost of the $i^{th}$ bush meat marketing firm

## RESULTS AND DISCUSSION

Table 2 shows that majority (56%) of the marketers are male. This may indicate that males engage more in bush meat marketing than the females. This is due to the perishable nature of the catches, if not quickly disposed or processed the quality may deteriorate hence hunters mostly dispose their games quickly and directly by themselves. 52% of the respondents are in the age bracket of 21 - 30 years. It may imply that active, brave and energetic people are engaged in the trade given the tedious and the risky nature of the business.

It was further revealed in table 2 that 66% of the respondents are married. This may be so because the business can generate enough income for their family sustenance. The literacy level among the respondent is high (84%). Thus it could be that bush meat marketers keep proper records and this may positively impact on their marketing practices.

Table 3 exhibits the distribution of the respondent's marketing experience. It shows that 52% of the respon-

**Table 4.** Parameters used to assess market structure.

| Index | Symbol | Formula used | Values obtained | Lower Link | Upper Link |
|---|---|---|---|---|---|
| Concentration ratio | CR | $\frac{x_n}{x_i}$ | $CR_2$ = 0.002<br>$CR_4$ = 0.003<br>$CR_8$ = 0.005 | 0 | 100% |
| Herfindahl index | HI | $\sum_{i=1}^{n} \frac{x_i}{T}^2$ | 0.34 | $\frac{1}{100}$ = 0.01 | 1 |

**Source:** Data Analysis, 2007.

**Table 5.** Distribution of the respondents according to operational efficiency.

| Operational efficiency | Frequency | Percentage |
|---|---|---|
| 1 - 10 | 5 | 10.0 |
| 11 - 20 | 3 | 6.0 |
| 21 - 30 | 7 | 14.0 |
| 31 - 40 | 3 | 6.0 |
| 41 - 50 | 8 | 16.0 |
| 51 - 60 | 10 | 20.0 |
| 61 - 70 | 3 | 6.0 |
| 71 - 80 | 5 | 10.0 |
| 81 - 90 | 4 | 8.0 |
| 91 - 99 | 1 | 4.0 |
| 100 | 50 | 100.0 |

**Source:** Data Analysis, 2007.

because of the perishable nature of catches, there is need for prompt marketing and/or processing as the case may be. More often than not the hunters do that directly by themselves.

Furthermore, Table 3 shows that trade association does not have much stake in price determination with 2.4% acknowledging their impact and 40% each claiming to use previous sales and cost of purchase and margin respectively. This implied that there is no standardized method of price determination in bush meat marketing in Ondo State. The months of highest level of supply was revealed to be December through April. This coincides with the period of dry season when the animals will be searching for food and water and this is invariably exposing them to predators (hunters). The incessant bush burning during the dry season which rid the animals of their habitat is also a major reason.

Table 4 showed that the two largest firms ($CR_2$) in the market accounted for 0.2%, largest four ($CR_4$) 0.3% and largest eight ($CR_8$) 0.5% of the volume of bush meat marketed. This is an indication of low concentration in the market and it suggests that there may be high probability of free entry and free exit by firms in the market. It may also suggest that the probability of having each of product differentiation, price collision and predatory pricing is low. Herfindal index (HI) estimated was 0.34, which indicated that there is some degree of concentration in the market.

Table 5 showed that 98% of the respondent had sub optimal operational efficiency. This is an indication of the existence of an efficiency gap. Thus, there is still room for efficiency growth.

## Conclusion

The study revealed that the majority of the respondents are males, got supplies mainly from hunters and are literate. The concentration ratio (CR) of the highest two firms ($CR_2$), largest four firms ($CR_4$) and largest eight firms ($CR_8$) were 0.2, 0.3 and 0.5% respectively. This is an indication of low concentration in the market that implies high probability of free entry and free exit by firms in the industry. The herfindahl index (HI) estimated was 0.34 and it is also a reflection of low concentration in the market. Operational efficiency estimates shows that 98% of the respondents operate at sub-optimal level and this indicates that there is still room for efficiency growth.

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