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Marketing in Ibadan Metropolis, Oyo State, Nigeria**

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## Analysis of Edible Snail (*Archachatina marginata*) Marketing in Ibadan Metropolis, Oyo State, Nigeria

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### Abstract

The study examined the marketing efficiency, profitability and the factors contributing to the profitability of snail marketing in Oyo State Nigeria. Forty copies of questionnaires were administered in five major markets in Ibadan (Aleshinloye, Oje, Orita-merin, Bodija and Apata markets). Simple descriptive analyses such as percentage and frequency table were used to describe the socio-demographic characteristics of the respondents while multiple regression analysis was used to examine the determinants of profitability of snail marketing. It was discovered from the empirical result that 90% of the sellers were female while 10% were male. One hundred percent (100%) of the sellers were 20years of age and above, and have 10 or more years of experience, 37% had no formal education while 40% had primary education and 23% had secondary education. The average profit N24, 250 forms the Budgetary Analysis (Av.selling price –Av.cost price) while the marketing efficiency for different markets are 1.98, 1.54, 1.19, 1.25 and 1.60 for Aleshinloye, Oje, Oritamerin, Bodija and Apata respectively. Four regression functions (Linear Function, Semi log, double log and Exponential Function) were run to analyze the determinants of snail marketing profitability. The exponential function provided the best of fit equation because it has more significant variables, highest coefficient of multiple regression,  $R^2$  (0.66) and lowest DurbinWatson, DW (1.473). The marketing of Snail can be said to be profitable, efficient and sustainable. It can reduce poverty. Therefore, further research should be carried out to domesticate and rear more edible snails in Oyo State and Nigeria as a whole to get more supply of protein and calcium in our diets.

**Keywords:** Marketing efficiency, Profitability, Non -timber forest product, Budgetary, Oyo State

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## Introduction

Snail meat is socially well accepted in many parts of Nigeria. It is commonly known as 'Congo meat' and it is also of the most delicacies in Nigeria. Many species of edible land snails are recognized in Nigeria but the popular species of economic interest is West Africa Snails *Achatina achatina* and *Archachatina marginata*. African snail is valued throughout the West Africa region as a source of food and income. (FAO, 1990). Snail farming is very lucrative as many Nigerians are realizing. Apart from the fact that it's easy to manage, it does not require much technicalities or capital as snails can easily be found around for the take off (Ismail Azeez, 2010). In Nigeria, the price of raw snails ranges from N150 to N600 depending on the size. The fast food culture has been enhancing demand for the prepared meat. Some farmers are on the supply bill of eateries and are, therefore assured of a ready market for their harvest. Markets abroad are also yearning for snails from West Africa. France requires about five million kilogram of snail annually with a larger percentage of it coming from West Africa. The United state of America also imports close to \$4m worth of snail annually from all over the world, including Nigeria (Azeez, 2010). In West Africa, mostly in Nigeria, the annual requirement is estimated to be 7.9mm/kg. In Ghana, it is 15,000tonnes. In France alone, 40,000 tonnes of snails are eaten per year. France still remains the main producer of snails to meet the demands of their markets (Lemhardt, 2004).

Marketing involves making contact between buyers and sellers for purpose of selling and buying (Eyiye 1991). Kotler (1995), state that marketing is a matter of getting the right goods and services in the right place at the right time with the right communication promotion. Bamigboye (1995) described marketing as a management process responsible for the identification, anticipation and satisfaction of consumer requirement. Marketing is a sum total of activities involved in a market. Some market for example, shops and stalls physically bring together the buyer and sellers. The essential features of market are demand, the behaviour of buyers, supply and the behaviour of sellers. The unique role of marketing is therefore the act that link production and consumption point. Marketing plays a vital role in the production process because a well organized efficient market structure ensures profitable return to sellers at a reasonable low price to consumers. The efficiency of marketing determines how producers will be able to increase their output.

Attention is currently on the potentials of wildlife farming as a means of poverty alleviation, one of the wild animals often touted as farm animal which has gained wild spread popularity for domestication is snail. Snail production and marketing constitute a major part of income for both rural and urban women and have limited alternative sources of livelihood (Ngenwi, *et al*, 2010). Snail production and marketing are gradually assuming wider significance in Nigeria as various factors, mainly employment and diminishing power prompt people to see the alternative to beat hard times. Snail, hermaphrodite animal belong to the species of animals called Mollusk. Snails are categorized into three: land snail, sea snails and fresh water snail. They are easily found in a cool, damp or humid environment because such area favors their existence. Virtually the two main component of a snail –the inner edible part and the hard outer shell are useful for several purposes. Reproduction takes place during rainy season as one snail mates with another of the same species, producing normally hundreds of eggs which hatch between 10-28 days, irrespective of the type. They mature within 5-8 months and could live as long as seven to ten years. Despite the flourishing of international trade in Europe and North America, and considerably in foreign and local demand, commercial snail farm hardly exist in Africa until recently (Cobbinal *et al* 2008). For instance, U.S import of snails worth more than US\$4.5 million in 1995 came from 24 countries.

It has been reported by FAO (1986) that the average animal protein intake in Nigeria is low calling for concerted effort towards alleviating this crises of protein shortage. Unfortunately, the conventional and regular sources of animal protein supply in the country like beef, pork, goat and poultry are getting out of reach of the common populace due to economic turn down. There is therefore need to look inward and integrate into our farming system some non conventional meat sources. (Ebenebe, 2000). This will complement the conventional animals as source of animal protein supply. Snails are source of protein that compete favorably with that of domestic animals being source of vitamin A, B, Iron, low fat cholesterol with stored minerals such as calcium, phosphorous, zinc and copper (FAO 1983). However, apart from sales from direct consumption the production of snail meal could further boost marketing and income. This can further empower the rural people economically and reduce poverty level. Crushed snail shell may be applied in chicken feed or liming to improve the quality of acidic (fish pond) soils (Cobbinal 2008)

Abere and Lameed, (2008) reported that the African giant snail *Archinata achatina* and *Achatina marginata* ) are used to cure whooping cough, anemia because of the high iron content, ulcer, asthma, aphrodisiac and hypertension. Abere and Lameed (2008) further maintained that the fluid of the snails is used to treat headache, treatment of dysentery, eye problems and small pox. The meat cures bone fracture, infertility in women while the shell is used to prepare talismans for protection and used culturally to appease the gods as well as to ward off evil spirits. Snail has also been successfully used to curtail malformation of bone structure and promotion of easy child birth, nourishment of lactating women, suppression of convulsion, healing of amputated fingers and circumcision of male and female children (Abere and Lameed (2008). It is used to reduce constipation, prevent influenza, a suppressant in stroke management, recommended to musicians for good voice maintenance according to Success Attitude Development Centre (SADC), 2010. Snail are healthy food, high in protein with almost no fat, contains small amount of cholesterol, low in kilojoules, and also contain amino acids vitamins and minerals. This makes it a rich delicacy for the aged those who are health conscious and ladies that are mindful of overweight. The poor lipid content makes it to be about the only meat apart from fish to be recommended for liver disease and arteriosclerosis patients, it is also recommended for diabetics and hypertension.

Forests provide important sources of income to many rural people in the West Africa Forest Zones. Forest products are traded in both local and urban market, and are sold to meet both rural and urban consumer needs. A great number of forest foods are gathered and sold in the local regional markets of the region, semi wild produce from trees on

farm and fallow lands. There are timber (woody) and non-timber forest products. Snail is one of the forest non-timber Forest Products (NTFPs). Non-timber forest products (NTFPs) are wild plants and animal products harvested from forests such as wild fruits, vegetables, nuts edible roots honey palm and medicinal plants, edible snail and bush meat (Anel, 2006). Anel (2006) Further maintained that, millions of people especially those living in rural areas in developing countries including Nigeria collect these products daily and many according to Sale (2006); Shomkegh *et al.*(2008) regard selling as a means of earning a living.

The main objective of this study is to identify socio-economic importance of Snails and the marketers, determine the Marketing efficiency of the snail market and to determine the profitability of the enterprise and the factors that affect the profitability

### Materials and Methods

The study was carried out in Ibadan metropolis. Ibadan is the capital of Oyo State, the biggest City in Nigeria and sub-Saharan Africa. It has population of 2,550,593 (Nigeria population Census, 2006). The city is located on the Southern Western part of Nigeria, lying between latitude 7° and 9°N of the equator, longitude 3°E and 5°E Greenwich meridian. It has an average rainfall of between 1250 mm and 1800mm. The temperature range is between 27°C and 32°C with relative humidity of about 75% to 90%. Ibadan metropolis consists of five local Government areas, namely Ibadan North, Southeast, North-West South-East and South West respectively. The indigenous language is Yoruba and major commercial activities are concentrated in the urban center of the state. There are little farming activities in the city hence most of the food consumed in the city, are produced outside the city especially in the surrounding villages.

The data were collected through the use of structured questionnaire and oral interview. Five major markets, Aleshinloye, Oje, Orita-merin, Bodija and Apata markets were purposively selected after the reconnaissance survey and forty copies of the questionnaires were administered in all. The questionnaires were not uniformly administered because the sellers vary in their concentration in different markets.

Descriptive statistics such as percentage frequency table, and regression analytical methods were employed for the data analysis of the study.

The following models as used by Okumadewa *et al* (2000) were adopted for the analysis.

Gross margin = Total Revenue – Cost Price

$$\text{Marketing Efficiency (ME)} = \frac{\text{Total revenue}}{\text{Total Marketing Cost}}$$

According to Usman *et al* (2010), the value of marketing range from 0% to infinity If ME is 100% (unity), it shows that the market is efficient: whereas if ME is greater than 100%, then there is excess profit. Also if ME is less than 100%, there is inefficiency.

The regression model is stated implicitly as:

$$Y = (X_1 X_2 X_3 X_4 X_5 X_6 X_7 X_8 X_9 X_{10} U)$$

$$Y = (X_1, X_2, X_3, X_3, X_4, X_5, X_6, X_7, X_8, X_9, X_{10}, X_{11}, e)$$

Y = Gross Profitability

X<sub>1</sub> = Gender

X<sub>2</sub> = Age

X<sub>3</sub> = Marital status

X<sub>4</sub> = Occupation

X<sub>5</sub> = Experience in years

X<sub>6</sub> = Educational statu

X<sub>7</sub> = Household size

X<sub>8</sub> = Quantity sold

$X_9$  = Educational level

$X_{10}$  = Selling price

$\beta_0$  = intercept

$\beta_1 - \beta_{10}$  = coefficient to be estimated

U = Error term.

## Results and Discussion

Table 1 shows that 90% of the marketers interviewed were females; this may be due to the nature of the trade which includes lack of labour intensive, social prestige, cultural factors and low capital requirement. It was also observed that 100% of the sellers were above 20 years of age (Table 1), and had 10 or more years of experience (Table 2). The reason is due to the fact that the business is not all that physically tasking and yet profitable. Table 2 shows that 35.0% had no formal education, 40% had primary education and 23.3 had up to secondary level. The trade does not require much professionalism and it is easy to start with little capital.

Table 3 and 4 gave the Budgetary Analysis of Snail Market, that is, the average cost price, average selling price and gross profit are all shown in table 3. For different five markets visited, Aleshinloye, Oje, Orita-merin, Bodija and Apata, the result shows that the trade is profitable in all the markets and the Gross Profit is N24, 800 (N69, 400–N44, 600).

The marketing Efficiency, ME for the different market are 1.98, 1.54, 1.19, 1.25 and 1.60, this means on every one Naira (N1) spent on snail 98k, 54k, 19k, 25k, and 60k were made as returns for Aleshinloye, Oje, Orita-merin, Bodija and Apata markets respectively. The aggregate Marketing Efficiency is 7.56 that implies generally that for every N1 spent on snail, there is a return of 56k (50% gain). The ME is above one, which shows that the trade is very efficient and has excess profit. According to Usman *et al* 2010, if ME is one (1) then the market is efficient, if greater than one is excess profit and less than one means not efficient.

Four Regression Functions were used to analyze the determinants of profitability of Snail marketing, Linear Function, Semi log, Double log and Exponential Function. The Exponential function provided the best fit equation because it has more significant variables, highest coefficient of multiple regression,  $R^2$  and lowest Durbin Watson, DW

$$Y = 2.60 - 0.3.2 X_1 - 0.55X_2 + 0.07X_3 - 0.12X_4 + 0.09X_5 - 0.62X_6 + 0.34X_7 - 0.12X_8 - 0.22X_9 + 0.15X_{10}$$

$$(1.652) (0.593) (0.222) (0.337) (0.127) (0.034) (0.219) (0.90) (0.135) (0.126) (0.147)$$

The Explanation of the statistics of this function is provided in Table 5. The Coefficient of Multiple Regression  $R^2$  is 0.816 i.e. 0.816% of the variability in dependent variable, Y (profitability) is explained by the Independent variables  $X_1$  (gender),  $X_2$  (age),  $X_3$  (marital statu),  $X_4$  (primary occupation),  $X_5$  (years of experience),  $X_6$  (educational statu),  $X_7$  (household size),  $X_8$  (quantity sold),  $X_9$  (cost price)  $X_{10}$  (selling price). Durbin Watson is 1.473 which means there is no autocorrelation in the estimate because DW is  $< 2$ . The coefficient for the variables marital statu, years of experience, household size, and selling Price have positive coefficient and are significant at 10% level of significant. This means that the higher the years of experience and selling price the more the profit earned. While others like the age ( $X_2$ ), primary occupation ( $X_4$ ) and education level ( $X_6$ ), cost price ( $X_9$ ), years of experience, quantity sold and household size have negative coefficient that is as these increase the profit decrease and as they decrease the profit increase. The Coefficient of multiple correlation  $R_c$  is 0.666.

## Conclusion and Recommendation

This paper observed that the snail business plays a vital role in the socioeconomic status of the traders as source of income and food security. It contributes to poverty reduction. The marketing is profitable as can be seen in the budgetary analysis. It is efficient (marketing efficiency is 7.56 meaning for every N1 spent on the snail trading there is 56kobo return) and sustainable. However, sustainable development or poverty eradication cannot be achieved until domestication and biodiversity conservation are encouraged. An exhaustive economic analysis and prevalence study of edible snail should be carried out in rainforest zone of Nigeria. This will assist in knowing the extent of distribution. Research should further be conducted on the full pharmacological potentials of the snail. Genetic research should be intensified so as to bring about an improvement in the snail production. In evaluating the marketing potential of non timber forest products of which snail is one, there is need for data acquisition to serve as a bench mark for future studies.

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Table 1: Socio economic characteristics of the Snail traders

Variables	Frequency	Percentage
Gender		
Female	36	90
Male	4	10
<b>Total</b>	<b>40</b>	<b>100</b>
Age		
20-30	8	20
31-40	12	30
41-50	12	30
51-60	7	17.5
60+S	1	2.5
<b>Total</b>	<b>40</b>	<b>100</b>
Marital Status		
Single	4	10.0
Married	29	72.5
Divorced	2	12.5
Widow	5	5.0
<b>Total</b>	<b>40</b>	<b>100</b>

Source: Field Survey, 2011.

Table 2: Contd. Socio-economic characteristics

Variables	Frequency	Percentage %
Educational Qualification		
No formal	14	35.0
Primary	16	40.0
Secondary	8	20.0
Tertiary	2	5
<b>Total</b>	<b>40</b>	<b>100</b>
Household size		
1-5	24	60.0
6-10	10	25.0
11+	6	15.0
<b>Total</b>	<b>40</b>	<b>100</b>
Years of experience		
0-10	18	45.0
11-20	16	40.0
21+	6	15.0
<b>Total</b>	<b>40</b>	<b>100</b>

Source: Field Survey, 2011

Table 3: Budgetary Analysis (Profitability)

Market	Average Cost Price	Average Selling price	Gross Profit
Aleshinloye	78,000	100,000	22,000
Oje	53,000	90,000	37,000
Oritamerin	42,000	60,000	18,000
Bodija	22,000	46,000	24,000
Apata	28,000	51,000	23,250
<b>Total Average</b>	<b>44,600</b>	<b>69,400</b>	<b>24,850</b>

Source: Field Survey, 2011.

Table 4: Marketing Efficiency, ME

Market	Revenue	Total Marketing cost	Marketing Efficiency
Aleshinloye	78,000	39,400	1.98
Oje	53,000	34,340	1.54
Oritamerin	42,000	35,200	1.19
Bodija	22,000	17,600	1.25
Apata	28,000	17,500	1.60
<b>Total</b>	<b>223,000</b>	<b>144,040</b>	<b>7.56</b>

Source: Field Survey, 2011.

Table 5: Exponential Function Result

Model	B	Standard Error	t -value	Sig.level
(constant)	2.598	1.652	.573	.127
Gender, X <sub>1</sub>	-.316	.593	.533	.598
Age, X <sub>2</sub>	-.550	.222	-2.480	.019
Marital, X <sub>3</sub>	0.073	.337	.217	.827
Occupation, X <sub>4</sub>	-.0117	.127	-.921	.364
Exp. Years, X <sub>5</sub>	.087	.034	2.571	.016
Edu.status, X <sub>6</sub>	-.615	.219	-2.813	.009
HH.Size, X <sub>7</sub>	-.340	.090	3.762	.001
Qqtty sold, X <sub>8</sub>	-.123	.135	-.909	.371
Cost price, X <sub>9</sub>	.220	.126	1.752	.090
Selling price, X <sub>10</sub>	.149	.147	1.020	.316

Source: Field Survey, 2011.

R<sup>2</sup> = .816, R = -.666, R<sup>2</sup> = .551