
Profitability analysis of giant african land snail marketing in Delta North, Nigeria

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Abstract Result found that the majority of the snail marketers were female and married with mean age of 40 years. The mean household size was 5 persons. Majority of the snail marketers are educated with mean marketing experience of 9years. The majority of snail marketers (76.92%) did not belong to an Association, and the mean income was ₦90,640. The total revenue was ₦171,129.24k and total cost was NI 15,262.16k. The marketing margin was ₦55,867.08k and also the benefit cost ratio and return on investment was 1.48 and 0.48, respectively. The marketing efficiency of snail marketers was 114.84%. The variables transportation cost, selling price, market levies, quantity of snail sold, loading and offloading cost influence profitability of its marketing. The major constraints affecting snail marketing were insufficient showed in credit facilities, transportation cost, price fluctuation, inadequate market information and inadequate storage facilities. The most predominant snail marketing channel was producer-wholesalers-retailers-consumers. The study concluded that giant African Land snail marketing was a profitable venture in the study area. The formation of cooperative societies is recommended and should be encouraged to enhance marketing especially in the area of purchasing large quantity.

Keywords: Giant African land snail, Marketing, Marketers, Profit

Introduction

The marketing of micro livestock is becoming popular due to the need to bridge the gap between protein requirement and actual protein consumed by the people (Cobbinah, 2001; Ajibefun, 2000). The interest in snail farming around the world is associated with the high-quality protein and medicinal values. Its meat is highly nutritious in some essential amino acids such as arginine, lysine, tryptophan and leucine (Emevbore and Ademosun, 2008). It had a significantly higher protein content compared to other domesticated animals, rich in some minerals such as calcium, potassium, magnesium and

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iron about 59mg/kg, poor sodium content and low fat and cholesterol levels (Bayode, 2009). The rich vital minerals embedded in the meat hence it is recommended for pregnant women and hypertensive patients. It has been reported that the meat were also used in the treatment of some ailments such as asthma and ulcer. In Rome, it was believed it enhance sexual desire (aphrodisiac properties) (Amao *et al.*, 2007). It is an important source of protein to human diet, additional source of income to farmers and marketers.

To avert danger of malnutrition in children, the giant African land snails (*Archachatina marginata*, *Achatina fulica* and *Achatina achatina*) are good substitute for other source of protein and reduction of malnutrition (Bayode, 2009; Ashaye, *et al.*, (2001). The marketing of snail internationally had recently been recognised globally with majority been imported in Europe (Amao *et al.*, 2007).

The production and marketing of snail across Nigeria is encouraging but are still domiciled to some areas due to religious and societal believes (Baba and Adeleke, 2006). In Delta State, snail's markets are becoming widely spread due to increased consumption and its production scale is low (Owolabi, 2002). Most snails marketed are harvested from the wild in Nigeria. Baba and Adeleke, (2006) observed that snail rearing for commercial purpose are significantly few. The fewer farms engaging might be due to lack of awareness associated with the economic benefits of micro-livestock (Azeez, 2010).

Its domestication has increased the marketing potentials recently. Several intervention efforts by Nigerian government to develop the snail sub-sector have not been successful compared to other livestock. Its marketing had been perceived to be the impeding challenge facing this livestock sub sector. Achoja (2005) postulated that without marketing, production - consumption cycle is not completed. There are some critical factors affecting the general performance of snail marketers.

However, the yearning of snail production globally needs proper marketing. Its marketing increase jobs, income, food security and economy growth. It is therefore imperative during its marketing to evaluate its cost and returns. The returns will help accessed the economic benefit associated with its marketing in this study.

The growth of small marketers overtime enhances their livelihood economically but there are some constrains mitigating or improving its marketing within the study area. The constant neglect in identifying the various activities that influence the effectiveness of its marketing within the study may just become a deterring factor that hinders most persons from getting involved in marketing of snail which on the long run affects the availability as well as development of the sector. Situations where the level of profitability of the

African land snail marketing is not analysed, the approach to it might continually affect its market sustainability. Recently, in Delta state, the profit margins in this venture have not been properly ascertained. Hence, there is an urgent need to investigate these constraints affecting the profitability of snail marketing.

The main aim was to analyse the profit margin of snail marketing in Delta North, Nigeria. The specific objectives were to investigate the socio-economic qualities of its marketers, cost and returns of snail farmers, factors affecting the productivity of its marketing, marketing channels and ascertain the constraints to the marketing of snail.

Materials and methods

The study was conducted in Delta North Agricultural Zone, Delta State, Nigeria. The Zone had significant agro-ecological qualities that enhance optimum productivity of plants and animals. The population of the study comprised of all snails' marketers. Delta North was purposively selected because there are numerous snails' marketers distributed all over the zone. Respondent were selected using multi stage sampling procedure. In the first stage involves random selection of 3 local government areas while secondly, three markets were selected randomly from the list of markets known for selling snail in each local government area. Finally, twelve marketers were selected randomly from each of the nine chosen markets making a total of one hundred and eight marketers (108) for the detailed study. However, due to the COVID-19 pandemic only 65 questionnaires were retrieved and analyzed. Constructive questionnaire were used to achieve the primary data. Data were analyzed with descriptive statistics such as frequency count, percentage, mean and inferential statistics.

Model specification

The profitability of snail marketers was achieved by gross margin.

$$\text{Gross Margin} = \text{Total Revenue} - \text{Total Variable Cost}$$

Also marketing margin will be determined using the formula

$$\text{Marketing Margin} = \text{Selling Price} - \text{Purchase Price}$$

It can also be expressed in percentage relating to the snail price

$$\text{MM} = \frac{\text{SP} - \text{PP}}{\text{SP}} \times \frac{100}{1}$$

The regression model was to achieve objective (iii) as stated in the implicit form of econometric model as

$$\text{SPF} = f(x_1 + x_2 + x_3 + x_4 + x_5 + x_6 + x_n)$$

The explicit form of the model as

$$SPF = B_0 + B_1EDW + B_2MEXP + B_3COT + B_4PP + B_5SP + B_6ML + B_7QS + B_8COLOFL$$

Where:- SPF = Sales Profit from snails Marketing (₦)

EDW = Educational Level (year)

MEXP = Marketing Experience (year)

COT = Cost of Transportation (₦)

PP = Purchase Price (₦)

SP = Selling Price (₦)

ML = Market Levies (₦)

QS = Quantity Sold

COLOFL = Cost of Loading and Off Loading (₦)

B₀ = Intercept term

B₁ – B₈ = Coefficient of parameter estimate

Results

The socioeconomic characteristics of snail marketers are presented in Table 1. It was observed that all (100%) respondents were female under gender distribution which clearly shows that female dominated snail market. The result showed that majority (69.23%) of the marketers were married while 13.85% of the respondents were single, 9.23% and 7.69% were divorced and widowed respectively. This indicated that married people were more involved. From the result, 35.38% of the marketers were within the age group of 31-40years while age range of 41– 50years and 20-30years accounted for 30.77% and 20% respectively. About 13.85% of the respondents were 51years and above while 39 years old was the mean age showing that women who were involved in snail marketing were still active and young. About 66.15% of respondents had between 4-6 people, 21.54% had 1-3 people while 12.31% revealed 7-9 people of household size respectively. The average household size was 5 people. The average household size was 5 which showed that there is availability of family labour to sustain their business venture.

The educational level showed that 61.54% of marketers had studied up to secondary school while 35.38% had primary education and only 1.54% had no formal education. This result revealed that majority were literate to adopt innovations that would positively affect the marketing of snail. From the results, 66.15% had marketing experience up to 10 years, 24.62% had 11-15 years marketing experience while about 9.23% had marketing experience of 16 years and above. The mean year of experience was 9years. This implies that the longer years spent on snail marketing with averse risk and generate more

income. Majority (76.92%) of the marketers did not belong any association while only 23.08% of marketers belonged to association. This revealed that the probability of accessing credit for the expansion of snail business will be hampered. The study also revealed that 73.85% of the respondent had income between ₦10,000 – ₦100,000 from the snail marketing business, 18.46% had income between ₦101,000 - ₦200,000 while only 7.69% earned between ₦201,000 - ₦300,000. The mean income of ₦90,640 indicates its marketing profitability.

Table 1. Socioeconomic characteristics of snail marketers

Variable	Frequency	Percentage	Mean/Mode
Gender			
Male	0	0.00	
Female	65	100.00	Female
Marital Status			
Married	45	69.23	Married
Single	9	13.85	
Divorced	6	9.23	
Widowed	5	7.69	
Age (years)			
20-30	13	20.00	
31-40	23	35.38	39 years
41-50	20	30.77	
51 and above	9	13.85	
Household size			
1-3	14	21.54	
4-6	43	66.15	5 persons
7-9	8	12.31	
Educational Status			
No formal education	1	1.54	
Primary education	23	35.38	
Secondary education	40	61.54	Secondary
Tertiary education	1	1.54	
Experience (years)			
1-5	24	36.92	
6-10	19	29.23	9 years
11-15	16	24.62	
16 and above	6	9.23	
Association			
Yes	15	23.08	
No	50	76.92	Yes
Income level (₦)			
10000-100000	48	73.85	
101000-200000	12	18.46	₦ 90640
201000-300000	5	7.69	

Source: Field Survey, 2020

Cost and return of snail

The cost and return analysis results revealed that total revenue was ₦171,129.24k and total cost was ₦115,262.16k. The marketing margin was ₦55,867.08 and also the benefit cost ratio and return on investment was 1.48 and 0.48 respectively. This showed that ₦1.00k invested during marketing, the marketer's return is 48kobo. This suggested that there is significant profit in this venture.

Table 2. Cost and return analysis of snail marketing

Items	Amount (₦)	Percentage
Variable cost		
Purchase price	1933.22	1.68
Loading and offloading	11486.16	9.97
Transportation	52092.30	45.19
Rent	26553.84	23.04
Market levy	16200.00	14.05
Feeding	6996.62	6.07
Total cost	115262.16	
Selling price	10529.24	
Quantity sold	32.54	
Total Revenue	171129.24	
Marketing margin	55867.08	
Marketing efficiency	114.84%	
Return on Investment	0.48	
Benefit cost ratio (BCR)	1.48	

Source: Field Survey, 2020

Factors influencing profitability of giant African land snail

The linear functional form in the regression analysis gave more statistically significant coefficients and higher magnitudes of R square and F value, and was chosen as the lead equation (Table 3). In the estimated regression model attempt was made to identify which of the coefficients of the variables selected provided a statistically significant effects to the specified model. The significance of the parameter estimate of the model was evaluated by means of t-test at 1% and 5% levels of significance. Five of the eight variables included in the model were significant. These parameters relate to transportation, selling price, market levies, quantity sold and loading and offloading costs. The R^2 is the coefficient of multiple determinations which measures the extent to which the variation in the dependent variable is explained by the regressors. The F value measures the goodness of fit of the model. The R^2 of the estimated model showed that about 88.2% of the total

variation in the profit made by marketers was explained by the explanatory variables, while the remaining 11.8% unexplained was due to the variables not included in the model which was the error term.

Table 3. Determinants of snail marketing profitability

Variable	Coefficient	Standard error	T	Significance
Constant	68916.839	10699.692	6.441	0.000***
Education	170.837	639.303	0.267	0.790
Experience	70.262	105.849	0.664	0.510
Transportation	-0.791	0.053	-14.875	0.000***
Purchase price	-1.024	5.304	-0.193	0.848
Selling price	11.256	1.454	7.744	0.000***
Market levy	-0.790	0.111	-7.100	0.000***
Quantity sold	4379.995	338.627	12.935	0.000***
Loading and offloading	-6.352	1.196	-5.309	0.000***
R-square	0.882			
F-ratio	52.419			

Source: Field Survey, 2020

Snail marketing channels

This revealed that 67.69% of the marketers bought snail from producers-whole-retailers -consumers, 27.69% of the marketers are producers-retailers-consumers, while only 4.62% of directly pass through from producers-to consumers. Thus, the common channel involves producers-wholesalers-retailers and consumers.

Table 4. Marketing channel of snail

Channel	Frequency	Percentage
Producers-wholesalers-retailers-consumers	44	67.69
Producers-consumers	3	4.62
Producers-retailers-consumers	18	27.69
Total	65	100.0

Source: Field Survey, 2020

Constraints to snail marketing

The major constraints affecting snail marketing are presented in Table 5. The constraints are insufficient credit facilities, transportation cost, price fluctuation, insufficient market information, market levies and inadequate storage facilities. The challenges had the capacity to paralyze the snail business venture if necessary action is not taken to ameliorate it.

Table 5. Constraints to snail marketing

Constraints	Frequency (YES)	Frequency (NO)
Transportation	52(80.00)	13 (20.00)
Market levies	42(64.62)	23(35.38)
Inadequate storage facilities	45(69.23)	20(30.77)
Price fluctuation	52(80.00)	13(20.00)
Insufficient credit facilities	57(87.69)	8(12.31)
Inadequate market information	45(69.23)	20(30.77)

Source: Field Survey, 2020

Discussion

Socioeconomic characteristics of the snail marketers

The result on gender revealed that all the snail marketers were female. This was expected given the less labour requirement and low capital needed to start the business. This agreed with Ebewore and Achoja (2013), who reported that women are seriously involved in snail marketing in Delta State, Nigeria. Ahaotu *et al.* (2019) also observed similar results of the involvement of female in snail marketing. The result showed that majority (69.23%) of the marketers were married. This indicated that married people were more involved. This will probably boost the household income. This suggest that those involved in economic activities are married which correspond with the findings of Oladejo (2019). From the result, 35.38% of the marketers were within the age group of 31-40years with mean age of 39 years old showing that women involved in snail marketing were still active and young. This result corroborated Jatau and Shidiki (2012) that at 40years individuals are actively involved in snail marketing because they are strong and hearty. About 66.15% of respondents had between 4-6 people with an average household size of 5 people. This shows that there is huge work force capacity to sustain this venture. The advantage of household size simply implies that they help in vending snails in road side and markets which improved household income. The educational level showed that 98.46% of marketers had at primary education. This result revealed that they were literate and willing to learn and adopt innovations that would positively affect the marketing of snail. The high level of literacy observed might afford them some level of managerial ability in their marketing activities. This agreed with Yusuf (2002) that most of the marketers of snails in Ibadan were educated. From the results, 66.15% had marketing experience up to 10 years with mean marketing experience of 9years. The number of years spent as snail marketers also enabled them to know the best ways to make profit and avoid losses. This validated Ogunniyi (2009) findings that 5 years' experience is enough for snail farmers to make profit. Majority (76.92%) of the

marketers did not belong to an association. This revealed that the probability of accessing credit for the expansion of snail business might be hampered. This result is in agreement with Aderounmu *et al* (2019) that been a member of cooperative enhance financial boost to expand scale of farm and marketing as *revealed* in the study and vice versa. The study also revealed that 73.85% of the respondent earned income between ₦10,000–₦100,000 from the snail marketing business with mean income of ₦90,640 which indicates that marketing of snail was profitable.

Cost and return of snail

The result of cost and return analysis revealed that snail marketing is profitable with benefit cost ratio and return on investment of 1.48 and 0.48 respectively. This indicated that any ₦1.00k invested, the marketer's return is 48kobo. The marketing efficiency level of 114.84% recorded was significantly favorable to marketers. This revealed that snail marketing was efficient and this agreed with earlier report of Okeke *et al* (2010) that this business venture is beneficial.

Factors influencing profitability of snail marketing

The result revealed that the coefficient of transportation had a negative relationship with the profit of snail marketers and was significant. This implied that as transportation cost increased, profit of snail marketers would decrease and vice versa. Any government policy that could reduce the transportation cost per kilometer would lead to growth in the profitability in snail marketing in the study area. This result is congruent with Achoja and Gbigbi (2019) studied on spatial and seasonal price variation of fresh tomato in Nigeria. The coefficient of selling price had a positive relationship with the profit of snail marketers. This indicated that a unit increase in selling price would lead to a corresponding great influence on profit. This is in line with a priori expectation. The coefficient of market levies had a negative coefficient and showed that market levies had an inverse relationship with the profit of snail marketers. This implied that a unit increase in market levies will reduce the profit of snail marketers. This result is in consonance with Achoja and Gbigbi (2019). The coefficient of sold quantity had a positive relationship with profit of snail marketers and was statistically significant at 1% level of significance. This is in conformity with a priori expectation that profit would increase as the quantity of snails sold increases. It had more quantity of snail traded and more the profit. The coefficient of loading and offloading cost was significant at 1% level with

a negative sign. By implication, increased loading and offloading costs of snail resulted in less profit for the snail marketers.

Snail marketing channels

This revealed that 67.69% of the marketers bought snail from producers-whole-retailers -consumers. This implies that the majority of marketers preferred the marketing channel of producers to wholesalers to retailers and consumers to others probably because of easy avenue of generating income. This findings agrees with Aderounmu *et al.* (2019) that the most utilized channel in marketing of a given product is producers to wholesalers to retailers and final consumers.

Constraints to snail marketing

Insufficient credit facilities majorly affects the marketers, about 87.69% respondents indicated this as a major constraint faced by them. The availability of credit would enable them increase purchases to expand their business to maximize profit. These findings are in consistent with those of Alamu (2004) who posited that most farmers lack money to procure facilities and other farm needs because of their expensive nature, the findings also collaborated that of Baba and Adeleke (2006) who noted that the rural farmers are not financially buoyant enough to venture into commercial farming as a result of poor income from subsistence farming system practiced by them. About 80% agreed that one of their major constraints was transportation. For example, insufficient vehicles to carry goods to/and fro from farms to the rural markets. In this case, transport accounts to an increased marketing cost. Example, areas with bad/good roads these farmers and marketers often maintained collectively. About 80% equally said that price fluctuation discouraged the marketers because it affected their marketing margin. Inadequate market information and inadequate storage facilities were confirmed by 69.25% and 69.25% respondents as serious challenges in the marketing of snail respectively. Most markets lack storage and warehousing facilities and the losses that occurred due to lack of these facilities often accounted for increasing cost of marketing snails and, hence, higher retail prices to consumers. About 64.62% also opined that market levies posed a serious problem because the collections from different sources were too much as such impinged on the profits generated. This supported previous work by Ugwumba, Obiekwe and Ozorm (2016).

It is concluded that the giant African land snail marketing significantly improved livelihood of marketers economically. Transportation cost, selling

price, market levies, quantity of snail sold, loading and offloading costs were factors affecting this venture. Some challenges faced by marketers included insufficient credit facilities, transportation cost, price fluctuation, inadequate market information and inadequate storage facilities. It should be recommended that males should be encouraged to join the wagon of snail dealers, formation of cooperative societies, access to credit facilities from lending institutions and marketing information should be made available to the snail marketers to improve on their profit level.

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