# Profitability of Snail Marketing in Ogo Oluwa Local Government Area of Oyo State, Nigeria

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## ABSTRACT

This study analyzed profitability of snail marketing in Ogo Oluwa Local Government Area of Oyo State. Purposive sampling technique was employed to select sixty one (61) respondents for the study and structured questionnaire was used to collect the primary data. The data were analyzed using both inferential and descriptive statistics. The study revealed that snail marketing in the area was dominated by the female gender. Average age of the respondents was 46.38 years. Majority of the respondents (73.8%) were married with average household size of 6, the average marketing experience among the respondents was 10.57 years. Primary occupation of the respondents was farming. On the average, respondents claimed to market 10 dozens of big sized snails and 15 dozens of medium snails on monthly basis. The benefit cost ratio was 1.51 revealing that the enterprise is profitable. Result of regression analysis revealed that the major determinants of revenue to snail marketing enterprise in the study area include cost of snail, marketing cost, fixed cost(depreciated), age of respondent and marketing experience. The major constraints to snail marketing in the study area include supply scarcity and financing the business. Based on the findings, the study recommended that the Government should make provisions for credit facilities to snail marketers and other small and medium enterprises (SME) at low interest rate to ease financial challenge being experienced by marketers. Registered trade association should be established among snail marketers with the aim to improve the marketing system and efficiency.

Key words: Profitability analysis, Snail, Marketing

## Introduction

Snails are bilaterally symmetrical invertebrates with soft segmented exoskeleton in the form of calcerous shells. They belong to the phylum Mollusca. In West Africa, snails dwell mostly in humid forest areas from where these are gathered by villagers for consumption and other uses (Onuigbo, 2015). The meat has traditionally been a major ingredient in the diet of people living in high forest zones (Agbogidi & Okonta, 2011). Snails have high protein content and medically valuable and so for this reason the demand for snail meat has increased over the years in both domestic and foreign markets. Over 80% of Nigerian populace is poor to whom protein products such as: Meat is a rare luxury. To avert danger of malnutrition, especially among children, the giant African land snail is a good substitute of source of protein (Bayobe, 2009). Asheye *et al.*

(2001) reported that snail could be used to reduce of problem of malnutrition. Snail meat is also high in iron, calcium and phosphorus, but low in sodium, fat and cholesterol and contains all the amino acids needed by man (Akinnusi, 2002 and Ejike, 2002). The high iron content of snail meat is considered important in the treatment of Anaemia and also for combating Ulcer and Asthma (Efarmpro, 2008). The snail meat has very low cholesterol level which is useful in the treatment of arteriosclerosis and other heart-related diseases (Abere and Lameed, 2008).In other African countries for example; the addition of 100gm of snail to the average Zambia diet would increase the protein by 50% while the amino acid in the protein of snail meat will add to Nigerian diet by 50% (Fagbuaro *et al*. 2006). The amino acid in the protein of snail meat would complement the cereal source of protein by making good the deficiency of lysine (Brender, 1992).  In addition to the nutritional value of snail meat, recent studies indicated that glandular substance from edible snails causes agglutination of certain bacteria, which could be of value against a variety of ailments including whooping cough (Cobbinah *et al*., 2008).

Snail farming (heliculture) is a potentially lucrative business in Nigeria. It can provide a sustainable solution to some common economic, nutritional and health challenges in southern Nigeria. It can bring about economic empowerment, self-employment and rural development. Snails are environmental –friendly, unlike other conventional livestock such as pigs, poultry and goats e.t.c. neither the snails nor its droppings smell offensively. Snail can be reared in the backyard. The amount of capital required for the establishment of snail farm is appreciably small and the practice requires little labour with no strenuous physical exertion (Goodman, 2008). Snails generally are noiseless and quite easy to handle (Agbogidi *et al*., 2008).  They can be reared in urban environment without infringing on the peace of neighbors. The practice also has the need for small space requirement. Besides, snail have been shown to adapt to various environmental conditions hence can be raise in small towns, cities, farms, at background or commercial level and villages (Ejidike, 2002). Snails sell generally high compared to other meat hence their establishment can go a long way solving unemployment, nutritional and health problems. According to Bonis (2007), France is the world leading consumers of snails, with the world consumption of rate 20,000 tonnes a year. Forty percent is imported from North Africa, China and Taiwan. The type of snail being discussed here is *Archachatina marginata*. This is due to the fact that it has more meat than other species and thus command higher price thereby giving more revenue to the snail farmer. According to Hamzat (2002), *Archachatina marginata* is common in Nigeria and it is an excellent source of animal protein. According to Murphy (2001), snails have been and are still much sought after food and come to the table as a gastronomous delight.

In marketing, the term market refers to the group of consumer or organization that is interested in the product, has the resources to purchase the product, and is permitted by law and other regulations to acquire the product, NeTMBA, (2012). Renaissance (2005) defined marketing as an organization function and a set of processes for creating, communication and delivery value to customers and for managing customer relationship in ways that benefit the organization and its stakeholders. The study of snail marketing is so important for two reasons, marketing acts as a vehicle for development for any economy aims at improving the welfare of it population and marketing serve as a link between production and consumption, Marketing, however, is concerned with all stage of operation which aids the movement of commodities from the farm to the

consumer, and these include assemblage of goods, storage, transportation, processing, grading and financing of all these activities.

Therefore, the motivation of this study is to draw attention to determinants of profitability of snail marketing enterprise as well as the challenges involved. The findings may provide basis for policy recommendation in improving snail marketing system in the country. Thus, the specific objectives of this study are to describe the socio-economic characteristics of snail marketers, investigate marketing activities performed by the respondents, estimate the cost and return associated with snail marketing, identify the constraints associated with snail marketing and investigate determinants of revenue associated with snail marketing.

## Materials and Methods

The study area is Ogo Oluwa local government area, Oyo State, Nigeria. Its geography coordinates are 7°50′ E to 4°8′ E. The population is 65,184 at the 2006 census with the projection of 91,600 in 2016. The area lies in the western rain forest zone. The main annual rain fall is between 1460mm to 4800mm annually with temperature ranging between $18^0$c to $28^0$c and a mean relative humidity of 70%. The study area is dominated by the Yoruba tribe. However, population of the Hausa, Igbo, Fulani and Tiv tribes found in the study area are also high. The major occupation of the people living in the study area is farming, while others engage in other form of business. The target population consists of all snail marketers in Ogo Oluwa local government area of Oyo State. Purposive sampling technique was applied in selecting the respondents and a total of sixty-one (61) snail marketers were interviewed. Data for the study were obtained from primary sources through the use of structured questionnaire.

Descriptive statistics such as table, frequency count and percentages were used to analyze socio-economic characteristics of respondents, marketing activities and marketing constraints. Budgetary analysis was used to estimate the profitability level of the enterprise while the ordinary least squares (OLS) regression analysis was used to analyze the relationship between transactions cost and revenue generated by snail marketers.

Mathematically:

GM=TR-TVC

Profit=GM-FC

Where:

GM= Gross margin;    TR= Total Revenue;    TVC= Total Variable Cost;    FC= Fixed Cost

Measurement of variables:

Dependent variable (Y) is revenue generated by respondents

Independent variables include: cost of snails ($X_1$), marketing cost ($X_2$), depreciated fixed cost ($X_3$), age ($X_4$), educational level ($X_5$), and snail marketing experience ($X_6$).

The linear form of the regression equation is

$Y= b_0 + b_1x_1 + b_2x_2$ -------- $b_6x_6+U$

The regression model is specified as

$Y= f(X_1, X_2, X_3,$ --------- $X_6)$

Where: Y= Revenue generated by respondents (#)

 $X_1$= Cost of snail (#)                    $X_3$= Depreciated fixed cost (#)

$X_2$= Marketing cost (#)                    $X_4$= Age of respondent (years)

$X_5$= Educational level (years)        $X_6$= Marketing experience (years)

## Results and Discussion

The socio-economic characteristics of the respondents like age, sex, marital status, household size, primary occupation, marketing experience and educational level of respondents were examined. Results of frequency distribution of the respondents by age, marital status, household size, primary occupation, marketing experience and educational level were presented in table 1. The age distribution showed that 3.3% of the respondents were in the age range below 30years while 11.5% claimed 60years and above. The mean age was 46.38 years implying that respondents are still economically active. This result corroborates Jatau and Shidiki (2012), Ugwumba et al. (2012), and Ugwumba et al. (2014) that marketing of snails was dominated by individuals in their active age. Gender distribution of respondents showed that 65.57% of them were female while 34.43% were male. It can be inferred that both male and female genders were involved in the business of snail marketing but women dominated the enterprise. This result also corroborates findings of Ahaotus et al., (2019) and Ugwumba et al. (2014) that marketing of snails were dominated by female individuals.

The result in terms of marital status showed that 73.8% of the respondents were married while 6.6% were divorced. This differs from the finding of Obinaju and Asa (2016) where 73.3% snail farmers were single in Itu local government area, Akwa Ibom State, Nigeria. It can however be inferred that marital status is not a barrier to involvement in snail business. The educational status of the respondents as revealed by analysis indicated that many (44.3%) of the respondents did not have access to formal education, 23.0% claimed primary education and 32.7% claimed secondary education. This finding also indicates that educational status is not a barrier to snail marketing. The primary occupation distribution of the respondents showed that, largest group (57.4%) of the respondents identified with farming as their primary occupation. This implicates that more than half of the respondents are farmers. On the religion affiliation, result showed that 60.7% of the respondents were Muslims, 26.2% were Christians while 13.1% were traditional worshippers. This is a reflection that religion is not a barrier to involvement in snail business. Household size distribution showed that 57.4% of respondents claimed between 6-10 household members, 32.8% claimed less than five while 9.8% revealed household size of greater than 10 members, the average was 6. Advantage of not too small household size is that members of the household helped in hawking snails along the road and in market places, resulting in boosting family income.

**Table 1:  Socio-economic characteristics of the respondents   n=61**

| Variables | Frequency | Percentage | Mean |
|---|---|---|---|
| Age | | | |
| <30 | 2 | 3.3 | 46.38 |
| 30-39 | 16 | 26.2 | |
| 40-49 | 19 | 31.1 | |
| 50-59 | 17 | 27.9 | |
| 60 and above | 7 | 11.5 | |
| **Gender** | | | |
| Female | 40 | 65.6 | |

| | | | |
|---|---|---|---|
| Male | 21 | 34.4 | |
| **Marital Status** | | | |
| Single | 5 | 8.2 | |
| Married | 45 | 73.8 | |
| Widowed | 7 | 11.5 | |
| Divorced | 4 | 6.6 | |
| **Educational level** | | | |
| No formal education | 27 | 44.3 | |
| Primary | 14 | 23.0 | |
| Secondary | 20 | 32.7 | |
| **Primary Occupation** | | | |
| Farming | 35 | 57.4 | |
| Trading | 24 | 39.3 | |
| Civil servant | 2 | 3.3 | |
| **Religion** | | | |
| Islamic | 37 | 60.7 | |
| Christianity | 16 | 26.2 | |
| Traditional | 8 | 13.1 | |
| **Household size** | | | |
| < 5 | 20 | 32.8 | 06 |
| 6– 10 | 35 | 57.4 | |
| >10 | 6 | 9.8 | |
| **Total** | **61** | **100** | |

Source: Field Survey, 2019

**Marketing Activities Performed by the Respondents**
Table2 showed the result of marketing activities. The mean year of experience was 11years.This corroborates the finding from Ogunniyi (2009)'s study that as then, average years of experience for snail farmers was 5years. Result based on source of snail showed that many (65.6%) got their snails from the bush and forest (handpicked). All (100%) of the respondents transported their snails through human labour. Result of analysis further showed that respondents claimed to experience physical loss (flood and theft). Respondents revealed that they did not belong to snail marketers association, implying there is no barrier to entry and exit from the firm. According to them there is no snail marketers association in the study area. Many of the respondents sort the snails and recorded their sales on monthly basis. Respondents claimed to sell average of 10 dozens big sized snails while they sell average of fifteen dozens of medium sized snails per month. According to the respondents, 12 pieces (a dozen) of snails is also referred to as a heap in the study area.

**Profitability Analysis of Snail Marketing per Month**
- Cost of snail = ₦65,000.00
  i.e. Big sized (₦3,500 per dozen x 10 = ₦35,000);Medium sized (₦2,000 per dozen x 15= ₦30,000)
- Marketing Cost(Transportation +Feeding + Labour) = ₦ 3,625.00
- Total Variable Cost(Cost of snail + marketing cost) = ₦68,625.00
- Depreciated Fixed Cost(Snail housing + land/ space rent) = ₦ 1,000.00

- Total Cost (Variable cost + Fixed cost) = ₦ 69,625.00
- Total Revenue ( Selling price x Quantity sold)= ₦105,000.00
  i.e. Big sized (₦6,000 per dozen x10 = ₦60,000); Medium sized (₦3,000 per dozen x 15= ₦45,000)
- Gross Margin = Total Revenue – Total Variable Cost = ₦36,375
- Profit = Gross Margin – Depreciated Fixed Cost = ₦35,375
- Benefit Cost Ratio (BCR) = Total Revenue ÷ Total Cost i.e.  (= #105000 ÷ #69625)
          BCR   = 1.51

The benefit cost ratio of 1.51 implies that for every ₦1 invested in snail business there is a return of 51kobo, the result revealed that snail marketing is a profitable enterprise in the study area. This corroborates with the findings of Ogunniyi (2009); Baba and Adeleke (2006) where the result of their benefit cost ratio were 1.38 and 1.39 respectively implying that snail production is a profitable enterprise.

**Table 2: Snail Marketing Experience of Respondents,   n=61**

| Experience | Frequency | Percentage | Mean |
|---|---|---|---|
| **Year of Experience** | | | |
| <10 | 33 | 4.1 | 11 |
| 10-19 | 18 | 29.5 | |
| 20-29 | 5 | 8.2 | |
| 30 and above | 5 | 8.2 | |
| **Source of Snail** | | | |
| Purchased from Personal snail farm | 6 | 9.8 | |
| Purchased from Snail Farmers | 14 | 23.0 | |
| Research Institute | 1 | 1.6 | |
| Handpicked in bush and forest | 40 | 65.6 | |
| **Physical Loss** | | | |
| Theft | 30 | 49.2 | |
| Flood | 31 | 50.8 | |
| **Association** | | | |
| Yes | 61 | 100 | |
| No | - | - | |
| **Measure of Sales** | | | |
| Size | 38 | 62.3 | |
| Weight | 23 | 37.7 | |
| **Quantity sold per month** | **Big   sized Frequency (Percentage)** | **Medium sized Frequency (Percentage)** | |
| <20 | 31 (50.8) | 5 (8.2) | |
| 20-40 | 30 (49.2) | 53 (86.9) | |
| Above 40 | - | 3 (4.9) | |

Source: Field Survey, 2019

## Constraints Associated with Snail Marketing in the Study Area

Table 3 showed that most of the respondents were faced with supply scarcity of snails, followed by high cost of purchase, financial challenge and unstable market price. Others include insufficient market information, low demand and high mortality rate.

**Table 3: Frequency and Percentage Distribution of respondents by constraints**

| Constraints | *Frequency | Percentage |
|---|---|---|
| Supply scarcity | 59 | 96.72 |
| High cost of purchase | 39 | 63.93 |
| Finance | 15 | 24.59 |
| Unstable market price | 15 | 24.59 |
| Insufficient market information | 09 | 14.75 |
| Low level of demand | 7 | 11.48 |
| High mortality rate | 1 | 1.64 |

\* Multiple responses
Source: Field Survey, 2019

## OLS Regression Analysis

The regression analysis was employed to reveal the determinants of revenue generated by respondents. The dependent variable is Revenue while the independent variables are the selected marketing related variables which include; cost of snail, marketing cost, depreciated fixed cost, age, educational level, and years of snail experience. Result showed that $R^2$value was 0.998 which means that, 99.8% variation in revenue is explained by the estimated independent variables. The coefficient of age was significant at 10% level with a positive sign. By implication, an increase in age will lead to increase in generated revenue. It means that, the snail marketers gain better understanding about the business as the age increases. The coefficient of snail stocking cost was significant at 1% level with a positive sign, by implication, better looking and heavier snails cost more but are more appealing to customers who are willing to pay more. This will generate more revenue for the snail marketers. The coefficient of marketing cost was significant at 1% level with a negative sign. By implication, increase in marketing cost of snail results in less revenue for the snail marketers. Depreciated fixed cost is significant at 5% with a negative relationship with revenue, implying that as fixed cost increases, revenue generated reduces.

**Table 4: Presentation of Regression Analysis Result of the Respondents**

| Revenue | Coefficient | t-value |
|---|---|---|
| Cost of snail | 0.984 | 145.562*** |
| Marketing cost | -0.028 | -4.177*** |
| Dep. Fixed cost | -0.017 | -2.42** |
| Age of respondents | 0.021 | 1.990* |
| Educational level | 0.013 | 1.588 |

| | | |
|---|---|---|
| Snail marketing experience | 0.014 | 1.486 |
| Constant | -3071.702 | -3.890*** |

Note:     *** Significant at 1 percent level of probability
            ** Significant at 5 percent level of probability
            * Significant at 10 percent level of probability
Source: Computations from field survey, 2019

## Conclusion and Recommendations

The study concluded that snail marketing is a profitable venture in the study area. Factors affecting revenue generated include cost of snail, marketing cost, depreciated fixed cost, age of respondent, years of schooling and snail marketing experience. Challenges faced by respondents include supply scarcity, high cost purchase, finance and unstable market price. The study recommends that registered trade association should be established among the snail marketers, so as to checkmate instability of market price of snail and other market related challenges in the study area. The government and non – government organizations should make provision of soft loans and credit to marketers of agricultural commodities especially the snail and medium scale enterprises to ease challenges of financing the business.

## REFERENCES

Abere, S. A. and Lameed, G. A. (2008): The Medical Utilization of Snails in Some Selected States in Nigeria (In) Onyekwelu, J.C., Adekunle, U. A. J. and Oke, D. O. (eds) Proceedings of the First National Conference of Forest and Forest Products Society (FFPs) held in Akure, Ondo State between 11th and 18th April, 2008. pp 233 – 237.

Ademosun, A.A., Omidiji, M.O. (1999): The Nutrient Value of African Giant Land Snail (*Archachatinamarginata*). *Journal of Animal Protection Resear*ch 8(2): 876 – 877.

Adeniran, E.O. (2000): Reproductive Performance of the Giant African Land Snails (*Archachatina marginata*) at Different Body Weights. Unpublished B. Agric. Project, Federal University of Agriculture, Abeokuta. p. 15

Agbogidi, M. O. and Okonta, B. C. (2011): Reducing Poverty through Snail Farming in Nigeria, *Agriculture and Biology Journal of North America*, 2(1): 169 – 172.

Agbogidi, O.M. Okonta, B.C. and Ezeani, E.L. (2008): Effects of Two Edible Fruits on the Growth Performance of African Giant Land Snail (*Archachitina marginata swainson*). *Journal of Agricultural and Biological Sciences* 3(3): 26-29.

Ahaotu E.O, Ogu M and Lawal M. (2019): Profitability of Snail (*Archachatina fulica*) in Njikoka Local Government Area of Anambra State, Nigeria*; International Journal of Animal and Veterinary Sciences*; volume 6:pp. 6-13

Akinnusi, O. (2000): Snail Rearing: Case Study of Abeokuta, Ogun State, Nigeria. Proceedings of 5th Annual Conference of Animal Science Association of Nigeria, Port Harcourt, Nigeria. September, 19 – 22

Asheye, O.A, Omole, J.A., Adetoro, F.O and Kehinde, O.F (2001): Effect of Processing on Chemical and Sensory Properties of two West African Snails. *Moore Journal of Agricultural Research,* 2(5): 1-10.

Baba K.M and Adeleke M.T (2006): Profitability of Snail Production in Osun State, Nigeria; *Journal of Agriculture and Food Sciences* 4 (2) pp147-155

Bayode O.T (2009): Snail Production Techniques: An Opportunity for Self-sustenance in the Face of Economic Recession. Cedar Consult-Seminar Paper

Bender, A. (1992): Meat and Meat Products in Human Nutrition in Developing Countries FAO Food and Nutrition. FAO, Rome, p.53.

Cobbinah J.R. (2008): Snail Farming in West Africa. A Practical Guide: C.T.A. Publication. Conference of the NSAP held in Akure. Pp. 307-310.

Efarmspro O. (2008): Snail Farming, Snail Management, Snail Rearing. E-book: www.efarmspro.com/snailfarming.php

Ejidike, R.N. (2002): Snail Rearing Practices in Southern Nigeria. *In*: Proceedings of 27th annual Conference of the NSAP held in Akure, 307- 310

Eze, C.C.,Ohajianya, D.O. & Oguoma, N.N.O. (2006): Analysis of Land Snail Marketing in Owerri Agricultural Zone of Imo State, Nigeria. *Animal Production Res. Adv. Inst. Sci. Res. Dev.* 2(2): 94-99.

Fagbuaro O., Oso J.A., Edward J.B. and Ogunleye R.F. (2006): Nutritional Status of Four Species of Giant land snails in Nigeria. *J. Zhejiang Univ. Sci. B. 7(9): 686-689*.

Goodman, A.K. (2008): Giant African Land Snails. World Animal Review 3:15-23

Hamzat, O. A., Omole, A. J., Oredehin, A. and Longe, O. G. (2002): Effect of Feeding Dried Kolanut Testa and Palm Kernel Cake Mixture on Growth Performance of Immature Giant Land Snails under Kola Plantation. *African Journal of Livestock Extension 9-12*

Jatau D.F. & Shidiki J.A. (2012): Snail Marketing: Means to Combat Poverty and Hunger: the Case of Edible Land Snails (*achachantina marginata*) in Jos, Nigeria. *International Journal of Applied Biological science 50: 3512-3519*

Murphy, B. (2001): Breeding and Growing Snails Commercially in Australia (No. 00/118). Australian Government: Rural Industries Research and Development Corporation.

Obinaju, L. C.; Asa, U. A. (2016): Economics of Rural Livelihoods: A Case Study of Snail Farming in Itu Local Government Area, AkwaIbom State, Nigeria. *American Journal of Research Communication,* 4(2): 75-85 www.usa-journals.com, ISSN: 2325-4076.

Ogunniyi, L. T (2009): Economic analysis of snail production in Ibadan, Oyo state*; International Journal of Agricultural Economics and Rural Developmen*t-2(1)

Onuigbo C.C (2015): Economics of Snail Production in Enugu East Agricultural Zone of Enugu State, Nigeria. Unpublished M. Sc. Dissertation, Department of Agricultural Economics, University of Nigeria, Nsukka, Nigeria pp. 99

Ugwumba, C.O.A., Omojola, J.T. & Chidebelu, S.A.N.D. (2014): Profitability and Determinants of Maximum Variable Profit of Yam Production in the Southwest Nigeria. *International Journal of Agricultural Innovation Res. 2(6): 905-908.*

Ugwumba, C.O.A., Orji, E.C. & Wilcox, G.I. (2012): Red Sokoto Goat Marketing in Enugu Metropolis of Enugu State, Nigeria. *Int. J. Appl. Res. Tech. 1(8): 71-77*