

## PROFITABILITY OF SNAIL FARMING IN NDOKWA WEST LOCAL GOVERNMENT AREA, DELTA STATE, NIGERIA

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**ABSTRACT:** The study is aimed at examining the profitability of snail farming in Ndokwa West Local Government Area, Delta State. Relevant data collected includes; socio-economic characteristics of snail farmers, management practices/ breeds of snail, costs and returns of snailery (quantities and prices of both input and output) and constraints of snailery production. Estimated gross margin of ₦18,000 and a net profit of ₦13, 933 were obtained from the study. Snail enterprise is profitable. The result also indicates that snail farmers were mostly male, literate, self-financed and took snail farming as part time. Lack of fund, lack of good breeding stock, pest infestation among others were some of the problems encountered by the respondents. Based on the findings, the study recommends that snail farmers and prospective farmers should ensure high level sanitary measures and medication to reduce pest attack, credit accessibility from formal and informal sources and setting up demonstration centers that will serve as source of improved foundation stocks.

**KEYWORDS:** profitable, snailery farming, Ndokwa West Local Government Area, Delta state

### INTRODUCTION

Successive government had embarked on policies and programmes aimed sustainable macro and micro livestock's production in Nigeria.

Snails are soft, bodied, invertebrates belonging to the phylum mollusea (Chah and Inegbedion, 2012). Agbogidi et al, (2008) argued that snails are bilaterally symmetrical invertebrates with soft segmented exoskeleton in the form of calcareous. Traditionally, snails meat has been a major ingredient in the diet of people living in the high forest zone (Agbogidi and Okonta, 2011). The meat is highly priced delicacy in many cities in Nigeria where it is popularly called "Congo meat". Snail meat is an excellent source of animal protein in many parts of West and central Africa (Blay et al; 2004), with protein content (20.7%) higher than that of conventional food animals (Malik et al, 2011). The meat is also rich in iron (Agbogidi et al 2008), potassium, phosphorus, essential amino acids and vitamin C and B complex (Baba and Adeleke, 2006, Okpeze et al, 2007) and low in fat (Cobbinah et al; 2008). Apart from its excellent nutritional value, snail meat has also been reported to be of good medicinal value. The low cholesterol level of the meat has made it useful in the treatment of arteriosclerosis and other heart-related diseases (Abere and Iameed, 2008). Snails are micro livestock that has recently attracted attention among peasant farmers in Nigeria as an aftermath of alarm raised by Food and Agriculture organization on animal protein deficiency (Adesope, 2000 and Akinnusi, 2000). Akinnusi (1998) reported that snails are species of animals associated with small body size, moderate nutrition and management that are referred to as microlivestock. The small size of these micro livestock animals (snail) is undoubtedly one of their most significant assets since it makes it possible to produce and manage on small areas and in cluster (Thys, 2001). This makes production affordable for peasant farmers with small compound. Snail farming has several advantages over most conventional livestock, and these include: low capital requirement less demand for professional skill, high fecundity and mortality, less labour requirement, noiseless nature of the animals, adaptation to various environmental conditions and availability of ready market (Baba and Adeleke, 2000) and Chah Inegbedion (2012).

There is therefore the need to look inward and integrate into our farming system some non- conventional meat sources (Ebeenebe, 2000). This will compliment the conventional source of animal protein supply. This work therefore focuses on snailery production as one of such livestock

### **PROBLEM STATEMENT**

As a result of the excellent nutritional attributes of snails, which can reduce to some extent, the country's malnutrition and undernourishment problems and roles played in the medical and pharmaceutical fields, it is important to rear snail in order to reduce its erratic supply caused by seasonal factors such as rainfall and relative humidity. Moreso, the impact of environmental and anthropogenic factors on the population of wild snails, coupled with the increase in the cost of conventional animals protein source, has necessitated renewed interest in snailery or heliculture.

### **OBJECTIVE OF THE STUDY**

The general objective of the study is to examine the profitability of snail farming in Ndokwa West Local Government Area, Delta State. The Specific objectives are;

- 1 identify the socio economic characteristics of the snail farmers (respondents)
- 2 ascertain the breeding system and management practice in the area.
- 3 estimate the cost and the returns of snail production in the study area.
- 4 identify the problems militating against the snail production in the study area.

### **HYPOTHESIS OF THE STUDY**

Null hypothesis; The socio economic characteristics of the respondents influences the revenue generated from the snail production.

### **JUSTIFICATION FOR THE STUDY**

This study will be useful to farmers who are involved in snail farming. It will also guide those farmers with intention to start snail production. The study apart from enhancing domestication and commercialization of sail farming will also assist researchers, policy makers, extension agents in the plan for sustainable snail farming.

### **METHODOLOGY**

The study was carried out in Ndokwa West Local Government Area, Delta state, Nigeria. The Local Government Area has its headquarters in Kwale (Utagba-Ogbe), Delta North senatorial zone. It consists of eight (8) communities among which are Kwale, Utagba Uno, Ogome, Abi , UKWANI, Emu, Obeti Egbo and Ndemili. It's population stood at 149,325 (National population Census, 2006). It occupied a land area of 816km<sup>2</sup>. The area is predominantly agrarian with crops such as yam, cassava, maize, plantain and melon grown as major crops. Livestock's such as poultry and goat are reared under free range around the homestead.

### **METHOD OF DATA COLLECTION**

Primary data were used for this study. The primary data were obtained through well-structured questionnaire which were administered to the respondents., oral interview and personal observations Relevant data collected includes socio economic characteristics of the farmers, management practices, problems of snailery, costs and return of snailery production

### **MEASUREMENT OF VARIABLE**

A reasonable number of variables were deployed in this study. They include snail production variable, socio-economic variables, management practices and constraints to snail production. Snail production variables includes the snail production output and inputs ie labour, feeds and prices of inputs and output. Socio- economic variables are the farmer's age, education level, farming experience, gender and household size.

**SAMPLING TECHNIQUE**

The study is made up of snail farmers in the area. The communities used in the study were selected using random sampling techniques. Five communities were selected out of 8 communities by means of balloting. The communities include-Onitsha Ukwani, Ogume, Utagba -Uno, Abbi and Kwale. Twelve (12) snail farmers were selected from each of the chosen communities making a total of 60 respondents..

**DATA ANALYSIS**

Data collected from the questionnaires were carefully assembled. The results obtained were systematically and scientifically analyzed through descriptive statistics. Both accounting profit (gross profit) and economic profit (net profit) were calculated. Accounting profit is revenue less explicit cost (expenses) only, while economic profit equals revenue less both implicit and explicit cost (Dwivedi, 2001). Explicit costs are payment for resource input purchase or higher by a firm in the process of production, while implicit costs are the opportunity cost of self-owned resource used by the firm (Leftwich, 1979)

The budgetary analysis computation is as shown below;

$$\text{Net Revenue (NR)} = \text{Total Revenue} - \text{Total Cost}$$

Where,

NR = Net Return

TR = Total Revenue

TC = Total Cost

Whereas the hypothesis formulated that state that there is a significant relationship between socio-economic variables of respondents and the revenue generated was realized with the help of regression analysis

The regression model is implicitly represented as;

$$Y = F(X_1, X_2, X_3, X_4, X_5, X_6, U_1)$$

Where y = Revenue or Net return (₦)

X<sub>1</sub>= Cost of labour (₦)

X<sub>2</sub> = Cost of feeds (₦)

X<sub>3</sub>= Number of snails reared

X<sub>4</sub>= Age of respondent (years)

X<sub>5</sub>= Farming experience (years)

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

U<sub>1</sub>= Error term

**RESULTS AND DISCUSSION**

**SOCIO-ECONOMIC CHARACTERISTICS OF RESPONDENTS**

Table 1 revealed that majority (45%) of the respondents were within the bracket of 41-50 years. This result is in agreement with the findings of Aiyeloja and Ogunjinmi (2010) and Ogunniyi (2009). However, the mean age of 46years recorded in the present study is higher than the 38.5 years recorded by Aiyeloja and Ogunjinmi (2010). Snail farming requires little labour with no strenuous physical exertion (Goodman, 2008) , and this may explain why majority of the snail farmers were above 40years of age. Table 1 also showed that 58.3% of the respondents were males while the remaining 41.7% were females . This finding is in agreement with those of Adinya et al. (2011), Aiyeloja and Ogunjinmi(2010) and Ogunniyi(2009) in Cross River, Ondo and Oyo States, respectively. Majority (61.7%) of the respondents were married with 80% having family size of between 1-5persons. Previous study also indicated that married people are more involved in snail farming probably so as to enhanced the household income Ogunniyi (2009) and Yusuf (2002). The study also shows that majority (68.3%) of the

respondents had one level of education or the other. The implication of this finding is that information on improvement of snail production can easily be adopted by farmers in the study area. Moreso, past literature indicated that snail farmers are highly educated, however lower percentage (58.5%) was reported by Ogunniyi, (2009). Majority (75%) of the respondents indicated that they are into part-time snail production, while the remaining 25% stated that they are into full time snailery production

#### MANAGEMENT PRACTICES ADOPTED BY RESPONDENTS

The management practices in snail production are presented in Table 2. The study reveals that 58.3% of the respondents feed the snails with pawpaw and cocoyam leaf, 16% of the respondents feeds their snail with papaw leaf and pawpaw fruits respectively. All the respondents (100%) agreed that they make use of natural mating during breeding.

The distribution of breeds according to the respondents shows that two species are commonly reared in the area. About 58.3% of the respondents reported that they used *Archachatina marginata* as their foundation stock because they have more flesh, larger in size and higher market value compared with *Archachatina archatina*, while 25% used both *Archachatina marginata* and *Archachatina archatina* as foundation stocks because *Archachatina archatina* produced more eggs than *Archachatina marginata*. Furthermore, about 50% of the respondents preferred the use of drums and tyres in rearing their snails, while the remaining 33.3% and 16.7% reported that snails are reared in trench pen and tyres and drums and fenced pens respectively depending on capital. F.A.O (2003) reported that snail enterprise depend solely on decay plant materials or waste from home and market. The snails ability to utilize these variety of readily available feeding materials help them achieve appreciable weight gains under intensive management and high dietary value of their meat and cheaper alternative to other animals protein sources (Adeyeye, 1996)

#### COSTS AND RETURNS OF SNAIL PRODUCTION

Table 3 revealed the average estimated revenue from 500 matured snail enterprise. The result showed that 500 matured snails were produced by the entrepreneur or farmer and sold at ₦150 per snail. A total of ₦75,000 was realized per annum, while the gross margin and net income (profit) were ₦18,000 and ₦13,933 respectively. Based on these estimate the enterprise was profitable in the study area. Moreso, implicit cost items were land and investment outlay. The land was obtained by high proportion of snail farmers through inheritance and investment costs were obtained from their personal savings and loans from friends and relatives which attracted minimal interests of 4.9%. The explicit cost items accounted for the following; family labour (40.9%), feeding (24%), disinfectants (8.2%) and medication 8.2%. Labour was provided by snail farmer's family and the feeds were sourced from calcium carbonate, fruits and vegetables and pawpaw leaf part of which were gotten from the farm.

#### PRODUCTION FUNCTION (REGRESSION) RESULT

Table shows the regression result of the formulated hypothesis. The estimated functions (model) were evaluated in terms of the statistical significance of the coefficient of multiple determination ( $R^2$ ) as indicated by F value, the significance of the coefficients and the magnitude of the standard error. Based on the statistical and economic multiple determination ( $R^2$ ) obtained i.e 0.644 which shows that 64.4% of the variation in the revenue of the respondents were explained by the included explanatory variables. The result further shows that cost of labour, number of snails, farming experience and education had positive signs. This implies that an increase in these variables would lead to an increase in revenue of respondents. Cost of feed and age of respondents had negative signs. These indicate that an increase in these variables would result to a decrease in the revenue of the respondents.

Table 1 summary of socio-economic characteristics of snail farmers

Variables	Frequency	Percentage(%)	Mean(m)
<b>Age (Years)</b>			
<30	4	6.67	46
31-40	9	15.00	
41-50	27	45.00	
>50	20	33.33	
Total	<b>60</b>	<b>100</b>	
<b>Gender</b>			
Female	25	41.67	
Male	35	58.33	
Total	<b>60</b>	<b>100</b>	
<b>Marital Status</b>			
Single	8	13.33	
Married	37	61.67	
Divorces/Widowed	15	25.00	
Total	<b>60</b>	<b>100</b>	
<b>Level of Education</b>			
No formal Education	19	31.67	
Primary Education	17	28.33	
Secondary Education	21	35.0	
Tertiary Education	3	5.00	
Total	<b>60</b>	<b>100</b>	
<b>Occupational Structure</b>			
Full time	15	25	
Part time	45	75	
Total	<b>60</b>	<b>100</b>	
<b>Family size</b>			
1 - 5	15	25	
6 - 10	45	75	
Total	<b>60</b>	<b>100</b>	
<b>Sources of capital</b>			
personal	50	83.3	
loan	10	16.7	
Total	<b>60</b>	<b>100</b>	

Source; Field survey, 2015

Table 2; Distribution of respondents according to management practices of snail production

Variables	Frequency	Percentage (%)
<b>A) Feeding and feeding patterns</b>		
Coco-yam leaf	5	8.3
Pawpaw leaf	10	16.7
Pawpaw fruits	10	16.7
Vegetable and fruits	3	5.0
Pawpaw & Cocoyam leaf	32	53.3
<b>Total</b>	<b>60</b>	<b>100</b>
<b>B) Breeding System</b>		
Artificial	--	--
Natural	60	100
<b>Total</b>	<b>60</b>	<b>100</b>
<b>C) Type of breeds</b>		
Archachatina Marginata	35	58.3
Archatina archatina	10	16.7
Both A- marginata and A- Arahatina	15	25.0
<b>Total</b>	<b>60</b>	<b>100</b>
<b>D Rearing Technques</b>		
Drums and Tyres	30	50.00
Trench pen and Tyres	20	33.3
Drums and fenced pens	10	16.7
<b>Total</b>	<b>60</b>	<b>100</b>

Source; Field survey, 2015

Table 3; Distribution of Average Costs and Returns for snail production per annum

Items of variable	Revenue Costs N	Percentage of TVC
A. Total Revenue (TR)	75,000	
B. Expenses		
Variable Cost		
Family labour	25,000	40.9
Feeding	15,000	24.6
Disinfectants	5,000	8.2
Medication	5,000	8.2
Transportation	4,000	6.5
Interest on Capital	3,000	4.9
Total Variable Cost	57,000	
C. Gross Income	18,000	
D Fixed Cost (Depreciation)	4,067	6.7
E. Net Income	13,933	

Source; Field survey, 2015

Table 4; Problems of snail production according to respondents

Limiting factors	Frequency	Percentage (%)
Lack of capital/funds	50	83.3
Lack of good breeding stock(laying)	40	66.7
Slow growth rate of snails	37	61.7
Inadequate information on management practices	38	63.3
Predators	48	80
Lack of land/space	45	75
Inexperience/lack of knowledge	30	50
Theft (human)	30	50
Diseases/pest infestation	50	83.3
High mortality rate	45	75
Inadequate market	40	66.7

Source; Field survey, 2015

## CONCLUSION/ RECOMMENDATION

The study examined the profitability of snail farming on small scale in Ndokwa West local government Area, Delta State.

Specifically, the study focused on the determination of economic viability of snailery enterprise, management/breeds of snails and the problems of snail farmers. The result indicates that farmers that invest on snail enterprise attain a gross margin of ₦18,000 and a net profit of ₦13,933. This shows that snail farming is profitable.

Based on the finding, the study recommends as follows;

1. Both Federal, State government and other stakeholders in the agricultural sector should ensure that all bottlenecks pertaining to access to credit should removed by strengthening micro finance institutions.
2. There is need to ensure high level of farm sanitation and good medication to reduce pest attack
3. Government should establish demonstration centres that will serve as source of improved foundation stock
4. Extension agents should embark on intensive enlightenment programs on the principles, practices and prospects of snailery production.

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