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DETERMINANTS OF GIANT SNAIL (*Achatina achatina*) PRODUCTION IN FEDERAL CAPITAL TERRITORY (FCT) AND NASARAWA STATE, NIGERIA: CHALLENGES AND PROSPECTS

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ABSTRACT

The study examined the determinants of giant snail (*Achatina achatina*) production in North Central, Nigeria, with a focus on its challenges and prospects. Sixty-four (64) respondents across 8 local government areas in 6 communities were purposively sampled for the study and this was due to the few numbers of snail farmers in the area. Descriptive statistics was used to analyse the respondents' demographic characteristics, level of production, cost-benefit analysis and constraints limiting production of snail. Logistics regression was used to analyse the hypotheses of the study. Results revealed that the average age, household size, stock size, farming experience and income were 43.59 years, 6 persons, 787 snails, 6.69 years of experience and ₦350,000.50 respectively. Majority (76.56%) of the farmers used constructed pens to house the snails they were producing and a low level of production of snail was recorded. An average of ₦80 was the profit level from every marketable size snail and this indicates that the business of snail production is profitable. Snail farming is constraint by many factors amongst which are: slow rate of growth, theft, pests and disease attack, lack of management skill, high rate of mortality and lack of funds. Demographic characteristics like age, education, household size and farm income were significant ($p<0.05$), while stock size and farming experience were significant variables to level of snail production. The study concludes that a profit of ₦80 is made from each marketable size of snail and that the business of snail production is a profitable one. It was recommended that farmers should use improved breeds of snail that have rapid growth and are early maturing for production.

Keywords: Giant snail production; profitability level; Housing system

INTRODUCTION

Giant snail (*Achatina achatina*) is a Mollusc and it has a single spiral shell of which it can withdraw the whole of its body. Snail farming has before now not been considered important because hand picking from the wild has been the practice and that many people

hadn't known of its importance (Cobbinah, 2003). The trend has changed as at today, in that snail farming is becoming increasingly practiced by local and commercial farmers. The farming is simply due to its increasing benefits being recognized by man (Idodo – Umeh, 2005). Snail meat is now well consumed by man and the reason is not unconnected to the numerous associated benefits which may include the high quality of the meat and its medicinal value as far as human health is concerned (Cobbinah, 2003). Bayode (2009) indicated that the protein content in value, ranged between 37 – 51 %, high in iron content (45- 59 mg/kg), low in fat (0.05 – 0.08 %), sodium and cholesterol. Bayode (2009) added that the formulations from the bluish liquid can be used to treat burns, abscesses, measles, smallpox and some other likely skin related diseases.

Amao *et al.* (2007) stated that snail meat is eaten and recommended for the treatment of ulcer, asthma, and even served in the old days to males and dignitaries especially in the evening believing to contain aphrodisiac properties which help to increase sexual desire in males. Based on these endowments, it is often advised to be eaten by hypertensive patients and pregnant women. On economic consideration, snail meat is expensive, and this accounts for why low-income earners find it difficult to buy them. To the farmers, it is a good source of income.

It is no news that meat source of protein is almost going extinct in the diet of majority of Nigerians, especially the poor. In other to cushion the effect on non-protein in-take, the Giant African land snail is often recommended to be farmed even at backyard level and be taken, believing it will substitute the protein in-take of man and as well does that at a higher rate and by such practice, it will help reduce to a large extent the problem of malnutrition which is often prevalent in the Nigerian society (Bayode, 2009). It is for these reasons that snail rearing has been advocated as a substitute to protein provision to the populace. Good enough, snail is produced at any time of the year and that it is not weather influenced. Nevertheless, for optimal production, Amao *et al.* (2007) recommended that the breeding of snail should start at the beginning of rainy season due to the availability of the feeds they depend on for survival. The benefits of snail production, consumption and income provision cannot be over-emphasized. It is on account of these lofty benefits that the study seeks to find out the determinants that could help promote large-scale snail production and bridge the gap of low protein intake by man. Achieving this will go a long way in increasing the quantity being produced from our agricultural system and therefore meeting-up with its demand. The lag between supply from small-scale farmers and the demand by the populace needs to the augmented, hence the need for commercial production has become necessary. This therefore makes the study timely. The study therefore seeks to examine the demographic characteristics of the respondents of the study, ascertain snail farmers production level, evaluate the cost-benefit analysis, determine the housing system adopted by the farmers in the snail production and identify the factors limiting snail production in the area.

METHODOLOGY

Area of Study

Nasarawa State and Federal Capital Territory (FCT) were the areas where the study was carried out. The reason for purposively choosing these areas was because of the relative peaceful nature of the areas within the Northcentral region of Nigeria.

Nasarawa State

Nasarawa State is centrally located in the Middle Belt region of Nigeria and lies between Latitude 8.570515^0N and Longitude 8.308844^0E. Its area is about 27.117 Km^2 thus making it to rank 15^{th} in land area coverage in Nigeria. It's projected population size as of 2022 is 2,886,000 (Nasarawa State, Nigeria Population Statistics). Nasarawa State has 13 Local Government Areas (LGAs) with its capital seat at Lafia. The indigenes are mostly known for agricultural production together with the fact that the State is a market centre for the yams, sorghum, millet, soybeans, shea nuts, and cotton grown in the surrounding area. Major tribes spoken by the people include: Agatu, Basa, Eggon, Gbagyi, Gade, Goemai, Gwandara, Ham, Kofyar, and Lijili. It as well has a huge deposit of mineral resources. Based on the aforementioned, farming and mining (for tin and columbite) are the principal activities of the area's predominantly Afo population.

Federal Capital Territory (FCT)

FCT was established in 1976 but eventually became operational in 1991 as the capital seat of Nigeria. FCT is made up of six Local Government Councils which are Abuja Municipal, Bwari, Kuje, Gwagwalada, Kwali and Abuja. The Abuja, Nigeria Metro Area Population projected the population size of Abuja as of 2022 to be about 3,652,000. The Federal Capital Territory has coordinates that lies between Latitude 9.04^0 N and Longitude 7.29^0E. The land mass of FCT is 8,000 Km^2 and it is located in the savannah region. Abuja capital city is located between the hills of the extensive Gwagwa plain. Ishaya *et al.* (2010) described FCT soil to be of made of parent materials that are coarse sandy loam in the basement complex to silt clay in nature. The climate of FCT is unique in that it distinctively has dry and the wet season. Ishaya *et al.* (2010) also described FCT to have an average temperature range of between 37^0C and 15^0C or 7^0 during the harmattan. The average rainfall is 1632mm and it occurs between April – October, and that its vegetation is guinea in nature, and it as well grow shrubs. FCT has mineral deposits like marble, clay, tin, mica, and tantalite (Ishaya *et al.*, 2010).

Sampling Techniques of the Study

Multi-stage sampling technique was used in selecting the respondents for the study. The first stage involved the purposive selection of FCT and Nasarawa State. This was immediately followed by stage two where four (4) local government areas (LGAs) were randomly selected in each case. The LGAs randomly selected from Nasarawa State include Karu, Keffi, Karshi and Akwanga LGAs. While Bwari, Kuje, Abaji and Gwagwalada area councils were randomly selected from FCT. This brought the total number of local government areas used for the study to eight (8). Stage three involved the random selection of two (2) towns/communities in each of the LGAs, thus making the towns used for the study to be sixteen (16) in number. The fourth stage involved the purposive selection of four (4) snail farmers town / community, and this made the number of farmers used for the study to be sixty-four (64). Table 1 shows the distribution of the respondents sampled for the study and administered with the question instrument used for the study.

Table 1: Distribution of respondents sampled for the study

State/FCT	LGA/Area Council	Towns	No. of respondents
FCT	Bwari	Dutse Alhaji	4
		Bunko	4
	Kuje	Adugo	4
		Bugako	4
	Abaji	Bago	4
		Ebaji	4
	Gwagwalada	Diko	4
		Bassa	4
Nasarawa	Kara	Agada	4
		Ang Kura	4
	Keffi	Fagidi	4
		Anguwan-Maiganga	4
	from Karshi	Karshi	4
		Baggi	4
	Akwanga	Akwanga East	4
		Anwan-Zaria	4
Total	8	16	64

Source of Data and Data Collection Instruments

Data used for the study were obtained from both primary and secondary sources. Primary data were sourced from the respondents with the use of structured questionnaire (for literate snail farmers) and interview scheduled (for illiterate snail farmers) while the secondary information was sourced from related documented materials.

Validity and Reliability of Instruments of the Study

The reliability test of the instruments was carried out with the use of test-re-test method. Reliability of the instrument was determined by administering the instrument at two different times within the space of four weeks to a similar group of farmers and the data collected were compared and a correlation value of 0.63 was obtained, indicating that the instrument was reliable.

Data Analytical Techniques

The data were analyzed with the use of descriptive and inferential statistics. Descriptive statistics was used to analyze the objectives of the study while inferential statistics which include Logistic regression and binomial test were used to test the hypothesis. Logistic regression was used to establish relationship between demographic characteristics and the level of production. It is expressed as:

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 \ldots + b_9X_9 + e \qquad (1)$$

Where:

Y = Level of production (High =1 (1000 and above snails); Low = 2 (less than 1000 snails))

a = Constant
b_i [1 – n or 8] = Coefficients
$X_1 – X_7$ = Independent variables
e = Error term
The variables in the equation are defined below
The variables in the model were specified as:
Y = Level of production (high =1 (1000 and above snails); low = 2 (less than 1000 snails)
X_1 = Gender (dummy: male = 1; female = 0)
X_2 = Age of respondents (years)
X_3 = Education (Primary Sch. =1; secondary sch. =2 and Post Sec. Beyond secondary school = 3) X_4 = Marital status (single = 1, married = 2, divorced = 3, widow(er) = 4)
X_5 = Farming experience (years)
X_6 = Stock size (number of snails in stock)
X_7 = Household size (number of people living and feeding together)
X_8 = Religious affiliation (Christian = 1, Muslim = 2, Traditional = 3, others = 4)
X_9 = Farm income (₦)

The binomial test was used to determine the significant difference in proportion of respondents that are satisfied and those not satisfied with the type of housing system adopted for snail rearing. The formula for binomial distribution is given as follows:

b(x;n,p) = nCx*px *(1-p) n-x----------(2)

Where:
b = binomial probability
x = total number of successes (satisfied or not satisfied)
p = probability of success on an individual trial n = number of trials

RESULTS AND DISCUSSION

Demographic Characteristics of Respondents

The demographic characteristics of the respondents is shown in Table 2. The results revealed that most (85.94%) of the respondents were males while few (14.06%) of them were females. This implies that snail production in the area is skewed towards male. The dominance of males in the farming of snail may not be unconnected to the practice of purdah (in Hausa, this is a practice where women are kept in seclusion). The result varies with the findings of Ahmadu *et al.* (2021) which found the farming of snail to be dominated by females in Edo South of Edo State, Nigeria. The difference in gender dominance may be in line with the difference in cultural, traditional, and religious beliefs of the residents of the areas. Majority (81.25%) of the farmers are married, 10.94% are single while 7.81% are divorced. The result indicates that snail farming is dominated by married people, thus implying that they are responsible and do have people to cater for in their households. This result is in consonance with that of Ahmadu *et al.* (2021) that found the dominance of married farmers in the farming of snail. The average age of the respondents was 43.59 years with most (37.50%) of them belonging to the age bracket of 40 – 49 years. The result implies that the farmers were young and in their active age group. The result corroborates findings of Afolabi (2013) who found snail farmers to be in their active age group.

The educational status of the respondents revealed that they were all literates with most (59.38%) having post-secondary educational qualification. The result simply implies that since they are literate, they would be able to carry out their farming activity with minimum or no assistance and know how to improve on their farming practice, given the available resources. This result is in line with findings of Ahmadu *et al.* (2021) who particularly found a high literacy level amongst snail farmers. In line with respondents' religion, most (76.56%) of the respondents were of the Christian religion. The result shows that snail production is skewed towards Christian religion thus indicating that snail production may have some bias to Muslim traditions and beliefs.

Table 2: Demographic characteristics of respondents. (N = 64)

Characteristics	Categories	Frequency	Percentage	Mean
Gender	Male	55	85.94	
	Female	9	14.06	
Marital Status	Single	7	10.94	
	Married	52	81.25	
	Divorced	5	7.81	
Age (years)	< 30	9	14.06	
	30 – 39	14	21.88	
	40 – 49	24	37.50	
	50 – 59	11	17.19	
	60 & above	6	9.38	43.59
Educational Status	Primary	4	6.25	
	Secondary	22	34.38	
	Tertiary	38	59.38	
Religious Affiliation	Christian	49	76.56	
	Muslim	8	12.5	
	Traditional	7	10.94	
Household size Range	1 – 3	12	18.75	
	4 – 6	32	50.00	
	7 – 9	17	26.56	
	10 – 12	3	4.69	5.52 = 6
Stock size (No. of snails in farm)	200 – 399	4	6.25	
	400 – 699	9	14.06	
	600 – 799	18	28.13	
	800 – 999	21	32.81	
	1000 & above	12	18.75	787
Farming experience (years)	< 5	30	46.88	
	5 – 9	16	25.00	
	10 – 14	`10	15.63	
	15 – 19	8	12.50	6.69
Income range (₦)	100,001 - 200,000	5	7.81	
	200,001 - 300,000	15	23.44	
	300,001 - 400,000	26	40.63	
	400,001 - 500,000	11	17.19	
	> 500,000	7	10.94	350,000.5

Respondents' household size revealed that most (50%) of them had household size 4 – 6 persons. The average household size was 6 persons. The result implies that the farmers have people to cater for in their household and this may be a source of economic- drain of the household. Contrarily, large household size may be a source of farm labour. Similar household size was found by Ahmadu and Ojogho (2012). On farm size, majority (32.81%) had between 800 – 999 snails in their farmers. The average snail in the farmer's farm was 787 snails. The result indicates that the snail farmers are small scale in nature. Findings of Baba and Adeleke (2006) justified this result as they found farming of snail to be of small-scale level.

Farming experience shows that the average farm experience of the farmers was 6.69 years with most (46.88%) of them having less than 5 year experience in the farming of snail. By implication, the farmers could be described as having good experience in farming of snail. This finding agrees with Ogunniyi (2009) who found similar result in number of years spent by farmers in snail farming. The respondents make an average income of ₦350,000.50 per annum. Most (40.63%) of the farmers earned between ₦300,001 – ₦400,000 as their annual income from snail farming. The result implies that the returns from snail production is highly profitable. This is in line with the findings of Ahmadu and Ojogho (2012), who reported high economic potential of snail farming enterprise for increasing household income and enhancing the living standard of the farmers.

Housing System used by Farmers in the Production of Snails

Table 3 reveals that various housing systems were used or adopted by the respondents in the rearing of snails in their farms. The housing system include the construction of pens, use of empty septic tanks, use of perforated drums and the use of used motor tyres. The result however revealed that most (76.56%) of the farmers adopted the intensive housing system that include housing them in constructed pens. Personal observation revealed that the pens were walled-round, having small netted windows with a door entrance.

Table 3: Housing system used by farmers in the production of snails

Housing System adopted by farmers	Frequency	Percentage
Construction of pens	49	76.56
Use of septic tanks	8	12.50
Use of drums	4	12.25
Use of tyres	3	4.69

From available information, the respondents also showed preference for intensive housing system because of the associated advantages which include having them being kept safe from thieves, diseases and from wandering away. The system also allows careful and thorough monitoring of the snails. The empty septic tanks are protected with wire mesh fitted with iron rods to protect the snails from been stolen, while the drums are perforated to allow the drainage of excess water, half or one-quarter filled with soil and surrounded with dangerous wire nets, just to protect the snails from predators, and thieves. Tyres were also used for housing the snails but wasn't as effective as the other housing methods. The result of Baba and Adeleke (2006) corroborated with this finding as they found the use of constructed pens as the housing system used by most snail farmers in the housing of snail.

Cost-benefit Analysis of Snail Production

The cost – benefit analysis of snail production is shown in Table 4. The result revealed that the average cost of producing everyone marketable size snail at farm gate is one hundred and twenty naira only (₦120). On the other hand, the selling price of same marketable size snail at farm gate is two hundred naira only (₦200) (depending on point of sale). The farm activities and their average cost implications that make up the total cost are feed (₦26.28), labour (₦72), calcium supplement (₦7.32), watering can (depreciation) (₦3.48), feeding can (depreciation) (₦3.72), water supply source (₦2.4) and housing (₦4.8). As shown in Table 3, the labour constitutes the majority (60%) of the cost of producing snail. This was however followed by feeds which make up 21.9% of the total cost of producing a marketable size snail. The high cost of labour may be connected to the fact that it is scarce, and snail is one creature many don't want to touch due to one reason or the other and this further deepens the labour unavailability in snail production. The results of Baba and Adeleke (2006) corroborated this finding as the found labour constituting about 64% of their total production cost of rearing snail. However, since cost of production and revenue at market price was ₦120 and ₦200 respectively, it simply implies that the sum of ₦80 is realized from everyone marketable size of snail produced. By this analysis given the present scenario, it could be inferred that snail production is very profitable in the area and can be ventured into as a way to enhancing the livelihood of the farmers. Baba and Adeleke (2006) also arrived at this conclusion.

Table 4: Cost-benefit analysis of snail production

s/n	Activities	Average Cost (₦)	Percentage
1.	Feed	26.28	21.9
2.	Labour	72	60
3.	Calcium supplement	7.32	6.1
4.	Watering can (depreciation)	3.48	2.9
5.	Feeding can (depreciation)	3.72	3.1
6.	Water supply source (depreciation)	2.4	2.0
7.	Housing	4.8	4.0
	Total	120	100

Categorization based on Level of Snail Production

The level of snail production was categorized based on the quantity being produced by the farmers (Table 5). The results revealed that, most (54.69%) of the farmers categorized their level of snail production as low because the average quantity produced was less than 1,000 snails. Justifying the farmers assertion concerning the low-level production, Table 2 revealed that the average number of snails produced was 787 snails, and this was rated as low in line with production capacity, hence the classification of production level to be small-scale in nature. The result indicates that the market has not been fully exploited implying that there is opening for more production and market for snail business. Supporting this result, Baba and Adeleke (2006) stated that production level of snail is still at low level, hence the farmers are regarded as small scale in nature.

Table 5: Categorization of snail production in North Central, Nigeria

Level of snail produced	Federal Capital Territory		Nasarawa State		Pooled	
Level of production	Freq.	%	Freq.	%	Freq.	%
High production level	4	12.5	5	15.62	9	14.06
Average production level	12	37.5	8	25.0	20	31.25
Low production level	16	50.0	19	59.38	35	54.69
Total	32	100.0	32	100.0	64	100.0

Influence of Demographic Characteristics on level of Production of Snail

The hypothesis on influence of demographic characteristics on level of snail production was analyzed with the use of Logistics regression as shown in Table 6. The independent variables were respondent's gender, age, educational level, marital status, farming experience, farm size, household size, religious affiliation and farm income. The dependent variable was level of production of snail (in quantity). These independent variables in one way or the other affected the dependent variable. The variables in the model jointly accounted for about 63.35% variation in level of snail production (adjusted $R^2 = 0.6335$). The model was considered appropriate for the analysis with the F-ratio (12.75) being significant at the 5% level since critical F-value = 2.62. Out of the nine independent variables in the model, five namely, education level, household size, farm size, farming experience and farm income were found to be significant to level of snail production.

On a specific consideration, farmers educational level respectively had b–coefficient and t–value of 2177.172 and 0.114 with level of farm production. The relationship was positive and significant ($p<0.05$). The relationship implies that the higher level of education possessed by the farmers, the more level of production of snails that is produced in the farm. The odd ratio was 3.935 implying that an increase in the level of education will lead to about 4 times the level of production that is expected. This is so because, education has a way of enhancing the farmers ability, capacity and capability. Findings of Ahmadu *et al.* (2021) was in line with this study. The authors found high level of education to positively enhance the profitability of snail farmers and this ought to have resulted from the level of production which is presumable assumed to be high.

Household size of the farmers (b = 1216.137; t = 1.341) had a positive relationship with level of farm production of the farmers. The relationship was significant ($p<0.05$), with an odd ratio of 2.231. This implies that a unit increase in household size will result to 2 time increase in level of production. Ahmadu and Ojogho (2012) agrees to the findings of this study as they reported that increase in farmers family members might go a long way in contribute to the business through the provision of family labour, all things being equal. Stock size of the farmers was positive and significant at the 1% level with level of farm production. Its b-coefficient was 2614.125 while the t–value was 1.172. The result implies that an increase in stock size (number of snails) will lead to an increase in farmers level of production. The odd ratio was 3.891 which thus indicates that an increase in stock size will lead to an increase of about 4 times in farm output level. Literally, an increase in stock size will result to a multiplier effect and thereby leading to an increase in production level.

Table 6: Influence of demographic characteristics on level of production of snail (logistic regression)

Independent variables	Coefficient (b)	t	p-value	Odds-ratio
Constant	11316.466	0.413	0.618	0.061
Gender	103.129	0.147	0.912	0.134
Age	214.951	0.725	0.004	2.072
Education	2177.172*	0.114	0.010	3.935
Marital status	113.314	11.714	0.310	1.147
Household size	1216.137*	1.341	0.003	2.231
Stock size	2614.125**	1.172	0.002	3.891
Farming experience	1715.214**	2.162	0.001	3.511
Farm income	1328.331*	1.371	0.015	2.846
Religious affiliation	1107.213	2.137	0.232	0.912

$=12.75$ ($p < 0.050$) (Critical F = 2.62); Adjusted $R^2 = 0.63.35$
*Significant at the 5% level; ** Significant at the 1% level

The farmers farm experience and level of farm production were positively related ($p<0.01$). The beta coefficient, t-value and odd-ratio were 1715.214, 2.162 and 3.511. By implication, an increase in farm experience will lead to about 4 times increase in farm level of production. Increase in farm experience helps the farmers to handle challenges and know how to manipulate the activities of the farm for increased output. This result agrees with findings of Baba and Adeleke (2006) who reported positive relationship between fame experience and profitability level which was agreed to stem from increase in level of production. Farm income of the respondents respectively had beta coefficient, t–value and odd ratio of 1328.331, 1.371 and 2.846. The relationship was positive and significant at the 5% level. The result implies that an increase in farm income will lead to an increase in level of production by about 3 times. Farm income will help to increase capacity, expansion of the farm in terms of stock size and facilities and therefore output. This accounts for why lack of funds was acknowledged by Munonye and Moses (2019) as constraint to increase in production level.

Relationship between Farmers Satisfaction and Snail Production Housing System

Hypothesis two which stated that, there is no significant difference in proportion of farmers that are satisfied and those that are not satisfied with the type of housing system adopted for snail rearing in the study area, was analysed with binomial test, and the result is presented in Table 7. From the result, a larger fraction (79.7%) of the snail farmers indicated that they were satisfied with the housing system used in the production of snail. On the other hand, the other fraction (20.3%) indicated that they were less satisfied with the housing system adopted in the production of snail. On a statistical note, the result was significant at the 1% level of probability. For this reason, the null hypothesis was rejected while the alternative was accepted, and this indicates that: there was a significant difference between the farmers that are satisfied and those that are not satisfied with the type of housing system adopted for snail production in the study area. The result suggested that the farmers

satisfaction with the housing system used in snail production is significantly high, since majority (79.7%) fell under this category. From the aforementioned, the result implies that the adopted housing system being used by the farmers is the better choice amongst available alternatives. It therefore means that the low level of production could be attributed to lack of capital and other associated challenges and not the housing system. So, increasing the production level would require a redress of the mentioned challenges. Low production of snail due to challenges and not type of housing system was supported by Baba and Adeleke (2006), Munonye and Moses (2019) and Ahmadu *et al.,* (2021).

Table 7: Difference in snail farmers satisfaction with housing system used for production

Satisfaction status	Frequency	Proportions	Prob. Level
Satisfied	51	0.797	0.001
Less satisfied	13	0.203	
Total	64	1.000	

Constraints Facing Snail Production

The various constraints limiting farmers in snail production is shown in Table 8. The problems/challenges were assessed from major challenge through moderate challenge, minor challenge and lastly, insignificant challenge. Furthermore, challenges that were agreed by 50% or more of the respondents were considered major challenge and so needs attention, while those identified by less than 50% were not.

Table 8: Constraints encountered by snail farmers in snail production

Constraints	Insignificant	Minor	Moderate	Major	Rank
Slow rate of growth of the snail	2 (3.13%)	4 (6.25%)	16 (25.00%)	41 (64.06%)	1st
Theft	7 (10.94%)	10 (16.63%)	13 (20.31%)	34 (53.13%)	2nd
Pest and diseases attack.	3 (4.69%)	9 (14.06%)	18 (28.12%)	34 (53.13%)	2nd
Lack of management / technical skill	5 (7.81%)	10 (15.63%)	16 (25.00%)	33 (51.56%)	4th
High rate of mortality	(0.00%)	12 (18.75%)	19 (29.69%)	33 (51.56%)	4th
Lack of funds for expansion	5 (7.81%)	10 (15.63%)	17 (26.56%)	32 (50.00%)	6th
Custom / traditional discrimination	6 (9.38%)	12 (18.75%)	20 (31.25%)	26 (40.63%)	7th
Price fluctuation	23 (35.94%)	35 (54.69%)	3 (4.69%)	3 (4.69%)	8th
Disturbance from neighbor	34 (53.13%)	23 (35.94%)	4 (6.25%)	3 (4.69%)	8th
Feed unavailability	27 (42.19%)	23 (35.93)	11 (17.19%)	3 (4.69%)	8th
Unavailability of market for snail produced	39 (60.94)	21 (32.81%)	3 (4.69%)	1 (1.56%)	11th
Low demand	43 (67.19%)	19 (29.69%)	2 (3.13%)	- (0.00%)	12th

According to the results, the major problems identified include slow rate of growth of the snail (64.06%), theft (53.13%) and pest and diseases (53.13%) These challenges respectively ranked the 1st and 2nd major problems faced by the farmers in the farming of snails. Other problems which ranked 4th and 6th major problems were lack of management skills (51.56%), high rate of morality (51.56%) and lack of funds for expansion (50.00%). The farmers acknowledged through personal communication, that these challenges have affected them (the farmers), the profitability level to a large extent and the prospects of snail

business. High rate of mortality and slow rate of growth of the snail were in line with the result as Baba and Adeleke (2006) who reported the aforementioned issues as major problems plaguing the production of snails. Findings of Ahmadu *et al.*, (2021) was in support with this result, as they found issues relating to theft, pest and disease attack and lack of management skills as some of the constraints plaguing snail production. Munonye and Moses (2019) agreed with the result in area of lack of funds as a major constraint plaguing snail production.

CONCLUSION

The study examined the determinants of giant snail (*Achatina achatina*) production in FCT and Nasarawa State, Nigeria, with a focus on its challenges and prospects. Intensive housing system is preferred, and more reliable housing system used in producing snail and its production is described as very profitable and still calls for more entrants into the business so that production level can be increased and then force its price to go down so that more persons can be able to be affording it and have their protein needs met. The probability of increasing the quantity of snail produced is high only if some of the constraints are addressed.

Based on findings, the study recommended that: There is a need for research centres through research to produce improved breeds of snail that have rapid growth and are early maturing and transmit such through extension agents to be used for production purpose by the farmers. The snail farmers should try to go extra mile in fixing security measures in place that can help to curb the menace of pilfering or theft.

Pens of snails need to be protected from pest and diseases. The soil being used, also need to be treated. This can be achieved by using appropriate and recommended pesticides that would help to eradicate pest that are plaguing snail production, and the farmers need to be organized into cooperatives or linked to sources of funds where they can access adequate funds that can enable them to expand their farms and increase in their level of production.

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